# BIOLOGICAL RESOURCES ASSESSMENT

**LANDS OF MORGAN**

**SOLANO COUNTY, CALIFORNIA**

LSA

February 2019

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## LANDS OF MORGAN

## SOLANO COUNTY, CALIFORNIA

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# 1.0 INTRODUCTION

LSA prepared this report for submission to the County of Solano. This report analyzes the biological resources at the project site and discusses potential impacts to biological resources from the proposed parcel subdivision in regard to the California Environmental Quality Act (CEQA) Initial Study Checklist questions. The assessment includes planning level recommendations to avoid or mitigate impacts associated with subdivision of the larger area into smaller parcels and to mitigate potentially significant impacts, if any.

This report contains preliminary survey results for the potential presence of special-status species, such as burrowing owl (*Athene cunicularia*) and Swainson's hawk (*Buteo swainsoni*), on the site (Figures 1 and 2). Although a vegetation map is included in this assessment, detailed floristic and faunal surveys for specific species were not conducted due to the timing of the site visit in late summer when many species are not identifiable (plants no longer in bloom) or have left the area (migratory species). Instead, this assessment was based on the habitats present on the site, the condition of those habitats, the geographic range of special-status species known from the area, and the potential for onsite habitats to support special-status species. Follow-up surveys during the appropriate time of year may be warranted, including a detailed tree inventory, breeding bird surveys, and aquatic surveys for potentially present special-status amphibians, such as foothill yellow-legged frog (*Rana boylii*), California red-legged frog *(Rana draytonii*), or California tiger salamander (*Ambystoma californiense*).

## 1.1 PROJECT LOCATION AND DESCRIPTION

For the purpose of this report, the "assessment area" consists of the property comprising the following assessor's parcel numbers: 105-110-070, 105-110-100, 105-110-440, 105-110-450, 105-160-130, 105-170-010, and 105-170-150. The project location is north of the City of Vacaville, outside the city limits and sphere of influence. The site is bordered by Gibson Canyon Road to the east and Cantelow Road and the adjacent South Fork of English Creek to the north and northwest. To the south, the site is bordered primarily by residential lots. The project parcels are currently zoned A-20 and are the only remaining large agricultural parcels in the area. Average parcel sizes in the area surrounding the project location range from 5 to over 20 acres.

The total assessment area comprises +/- 305 acres. The proposed project consists of the subdivision of the entire 305-acre rural agricultural property into 15 residential lots (20 acres each) and the rezoning of one lot (APN 105-170-110) from A-20 to RR2.5. The project further includes two proposed 60-foot-wide roads, and suggested building sites and leach field locations.

## 1.2 PURPOSE

The purpose of this assessment is to document the biological and natural resource conditions at the site and evaluate potential impacts to sensitive resources pursuant to the CEQA checklist (see Title 14, Chapter 3, California Code of Regulations, Sections 15000 et seq. and Division 13, California Public Resource Code, Sections 21000-21178). This assessment evaluates the project's potential to:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife (CDFW) and U.S. Fish and Wildlife Service (USFWS)?

- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

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

# 2.0 METHODS

## 2.1 DATABASES REVIEWED

Prior to accessing the site, LSA evaluated multiple existing databases regarding the potential special-status species that may be present at the site. In particular, LSA accessed the following databases:

- **California Native Plant Society (CNPS) Online Inventory**. LSA accessed the CNPS Online Inventory of Rare and Endangered Vascular Plants of California for all rare plant records on the United States Geological Survey (USGS) *Vacaville and Napa Quadrangle*[1].

- **California Natural Diversity Database (CNDDB).** LSA queried the CNDDB for occurrences of all wildlife and plant species subject to CEQA within a 5-mile radius of the property boundary.

- **USFWS Information for Planning and Conservation (IPaC) Online System.** LSA used the USFWS IPaC online system to determine if the property is in any designated critical habitat. The IPaC online system was also used to generate a list of special-status plant and wildlife species that the USFWS suggests may occur within or near the property, or be affected by a project on the property. The search area was defined by drawing the property boundaries onto the IPaC online mapper.

- **Other Sources.** LSA reviewed the public draft of the Solano Habitat Conservation Plan (HCP) for information on protected biological resources that could potentially occur on the property.

## 2.2 RECONNAISSANCE-LEVEL WILDLIFE AND VEGETATION SURVEY

LSA Senior Wildlife Biologist Steve Kohlmann, PhD, conducted a reconnaissance-level survey of the project site from approximately 9:15 a.m. to 1:20 p.m. on August 30, 2018, and again on September 12, 2018, from 8:30 a.m. to 9:45 a.m. The site was surveyed on foot. Geo-referenced photographs (Appendix A) were taken of representative portions of the site. Plant and animal species observed during the survey were recorded in field notes. Weather conditions during the survey consisted of sunny skies and temperatures in the high 80s°F. LSA conducted the survey to assess current habitat conditions and evaluate the potential for the property to support special-status species and sensitive natural communities. Focused rare plant and protocol-level wildlife surveys were beyond the scope of this reconnaissance-level survey.

A pedestrian survey of all accessible land was completed to search for signs of burrowing owl activity. Binoculars (10 x 40) were used to aid in identification of bird species, behavioral observations, and investigation of suitable habitats. Following the guidance provided in the California Department of Fish and Wildlife (CDFW) 2012 Burrowing Owl Staff Report, the assessment evaluated the project area for suitable burrowing owl habitat (e.g., burrows, structures), with particular attention to habitat suitability and utilization (e.g., whitewash, pellets). The survey also identified suitable habitat for Swainson's hawk. Due to the timing of this survey outside the primary

[1] California Native Plant Society, Rare Plant Program. 2018. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.38). Website http://www.rareplants.cnps.org [accessed 5 September 2018].

breeding season of migratory bird species, LSA could not evaluate the presence of active bird nests that are protected under the California Fish and Game Code.

LSA did not evaluate the proposed activities with respect to potential avoidance and mitigation requirements pursuant to the current Draft Solano Habitat Conservation Plan (Solano HCP). The Solano HCP is not yet approved by the USFWS and the County of Solano is not a direct participant in the HCP.

## 2.3 WETLAND DELINEATION

LSA Senior Biologist and certified wetland delineator Bernhard Warzecha investigated the assessment area on September 11, 12, and 19, 2018. The presence of potential wetlands was determined following guidance of the *Corps of Engineers Wetlands Delineation Manual*[2] and the revised procedures in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region.*[3] This method assesses the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. All of these parameters must be satisfied for an area to be considered a jurisdictional wetland. Wetland indicator status of vegetation follows the *2016 National Wetland Plant List for the Arid West Region*.[4]

LSA established 12 sample points in the assessment area. Clean Water Act (CWA) jurisdictional boundaries and sample point locations were mapped using a global positioning system (GPS) receiver capable of submeter accuracy. Wetland boundaries were determined by following a combination of the limits of hydrophytic plant species, the limits of observed wetland hydrology, and topographic breaks.

Potential Corps jurisdiction of observed wetlands, tributaries, ditches, and culverts was determined following the definitions in the 2015 Clean Water Rule and the *Technical Support Document for the Clean Water Rule: Definition of Waters of the United States*.[5] Specifically, tributaries were determined through presence of bed, bank, and OHWM and/or hydrological connectivity. OHWM was determined and characterized using definitions and guidance of *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States*.

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

3 U.S. Army Corps of Engineers. 2008. *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.

4 Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published April 28, 2016. ISSN 2153 733X.

5 Technical Support Document for the Clean Water Rule: Definition of Waters of the United States. 2015. U.S. Army Corps of Engineers.

# 3.0 ENVIRONMENTAL SETTING

## 3.1 TOPOGRAPHY, GEOLOGY, AND SOILS

The project site is located north of Vacaville, California, within the English Hills area, a low mountain range in northern Solano County (Figure 1), which is part of the Coast Range. The project area is characterized by steep hills, with elevations ranging from 280 feet above sea level along English Creek to over 580 feet (Figure 2). Bedrock in this geographical province is dominated by Cretaceous marine sedimentary units, with smaller inclusions of Tertiary sedimentary and basic igneous rocks. These units form ridges with intervening narrow valleys that trend northwest.

The geologic subunits in the assessment area include Paleocene to Oligocene (mudstone and sandstone) strata in the western and northern portions of the assessment area, and Miocene to Pliocene (sandstone and conglomerate) deposits in the flat portion along Gibson Canyon Road. The assessment area is located within 1 mile of the Great Valley thrust fault system, a group of northwest-southeast trending faults running along the base of the Coast Range. The assessment area has a potential for landslides as evidenced by several slumps visible in the western portion of the property. Landslides and slope instability is caused by movement of soils and surficial deposits and bedrock down steep slopes, usually during times of wet weather and/or seismic shaking.

The primary soil types in the Vacaville area are silty, sandy, and clay loams, with a smaller portion being made up of purely clay soils. In the assessment area, the primary soil types (Figure 3) are Altamont clays (23%), Dibble-Los Osos loams (24%), and Millsholm loam (41%). Altamont soils are the most clay-rich soils (up to 46%), followed by Ricon loams (33-37%), Dibble-Los Osos loams (31-33%), and Millsholm loams (14-23%). These soils have significant shrink-swell potential, evident in large cracks at the surface during the summer. Erosion potential of soils in the assessment area is generally modest to high, predominantly due to the steep slopes (Table A, Figure 2).

## 3.2 CLIMATE

The climate of northern Solano County is Mediterranean, with hot dry summers and wet cool winters. Most precipitation falls from November through March, amounting to approximately 24 to 28 inches in a normal year. Precipitation falls as rain and is derived from frontal storms that originate over the Pacific Ocean. Rainfall distribution is affected by topography, and generally gradually increases from east to west, due to the orographic effect of the Vaca Mountains to the west of the assessment area.

## 3.3 VEGETATION COMMUNITIES

The site is located in the Inner Coast Range Natural Community. The overall landscape consists of grasslands dominated by ruderal grassland species, scattered stands of native and nonnative trees, and riparian corridors. The assessment area contains graveled roadways and ranch roads, undisturbed upland grasslands, and disturbed sites (former homesites, cattle corrals); wetland areas exist at two ponds and along major drainages. Uplands are dominated by annual grasslands with interspersed oak woodlands (see Figure 4, Vegetation Communities and Habitat Types).

## Table A: Soils of the Assessment Area, Including their Geologic Parent Material and Erosion Probability, K-Factor – Ranging from 0.02 (low) to 0.69 (high)

| Map Unit Symbol | Map Unit Name | Acres | Percent of Area | Parent Material | K Factor Rating |
|---|---|---|---|---|---|
| AcC | Altamont clay, 2 to 9 percent slopes | 47.1 | 16% | residuum weathered from siltstone | 0.2 |
| AcE | Altamont clay, 9 to 30 percent slopes | 13.6 | 5% | residuum weathered from siltstone | 0.2 |
| AcF2 | Altamont clay, 30 to 50 percent slopes, eroded | 9.2 | 3% | residuum weathered from siltstone | 0.2 |
| BrA | Brentwood clay loam, 0 to 2 percent slopes | 1.1 | 0% | alluvium derived from sedimentary rock | 0.28 |
| CvD2 | Corning gravelly loam, 0 to 12 percent slopes, MLRA 17 | 6.8 | 2% | old alluvium derived from metamorphic and sedimentary rock | 0.28 |
| DbE | Dibble-Los Osos loams, 9 to 30 percent slopes | 32 | 11% | residuum weathered from sandstone | 0.37 |
| DlE | Dibble-Los Osos clay loams, 9 to 30 percent slopes | 43.8 | 14% | residuum weathered from sandstone | 0.37 |
| GaG2 | Gaviota sandy loam, 30 to 75 percent slopes, eroded | 6.5 | 2% | residuum weathered from sandstone | 0.2 |
| MmE | Millsholm loam, 15 to 30 percent slopes, MLRA 15 | 105.5 | 35% | residuum weathered from sandstone and shale | 0.32 |
| MmG2 | Millsholm loam, 15 to 65 percent slopes, eroded, MLRA 15 | 8.6 | 3% | loamy residuum weathered from sandstone and shale | 0.32 |
| MnE | Millsholm loam, moderately deep variant, 9 to 30 percent slopes | 8.6 | 3% | residuum weathered from sandstone | 0.43 |
| RnC | Rincon loam, 2 to 9 percent slopes | 2.9 | 1% | alluvium derived from sedimentary rock | 0.28 |
| RoA | Rincon clay loam, 0 to 2 percent slopes | 13.7 | 5% | alluvium derived from sedimentary rock | 0.24 |
| RoC | Rincon clay loam, 2 to 9 percent slopes, MLRA 14 | 4.9 | 2% | clayey alluvium derived from sedimentary rock | 0.32 |
| **Totals for Area of Interest** | | **304.3** | **100%** | | |

Source: Natural Resources Conservation Service, https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

### 3.3.1 Annual Grasslands

Inner Coast Range grasslands are associated with the dry conditions that typically occur on hillsides, slopes, ridges, and flat areas with well-drained soil within the Inner Coast Range and foothill terraces (see Photos 1-3 in Appendix A). Annual grasslands can fluctuate in species composition and production, mostly due to variable precipitation and temperature, presence/absence of fire, site-specific management, etc. Annual grasslands in the assessment area are a naturalized plant community, because they are comprised mostly of nonnative annual grasses with a small constituent of forbs. Common species at the site include many alien and native annual grasses, such as ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), foxtail chess (*Bromus madritensis*), slender wild oat (*Avena barbata*), common wild oat (*Avena fatua*), and ryegrass (*Festuca multiflorum*). Forbs can be abundant in spring, including filarees (*Erodium botrys* and *E. cicutarium*). Fall temperatures and precipitation are major factors determining grassland composition, along with light intensity affected by shading from plants and litter, and differences in micro-topography and grazing history.

### 3.3.2 Oak Woodland and Oak Savanna

Both oak woodland and oak savanna are wooded communities that are dominated by oaks (*Quercus* spp.). However, the density and structure of these plant communities vary within their distributional range depending on the dominant species of oak and other environmental parameters, such as soils, availability of water, aspect, and elevation. Oak woodland and oak savanna commonly intergrade, going from dense woodlands to open savanna. These communities, while not as diverse floristically as grasslands, support an unusual diversity of animal species as a result of the many resources that oaks provide, including nesting sites and an abundance of food (i.e., large acorn crops). Many oak woodland and savanna habitats have been lost due to intensive agriculture and urban development, and most oak woodlands that do persist have been significantly altered as evidenced by the predominance of nonnative annual grasslands as ground cover. Regeneration of oak woodlands has been greatly reduced due to disturbance from grazing and increased seedling mortality from competition with nonnative grasses.

#### *3.3.2.1 Oak Savanna*

Oak savanna is an open canopy community similar to grasslands, but with an overstory consisting of mature native oak trees. The canopy cover in oak savanna typically ranges from 10 to 30 percent, and dominant oak species include valley oak (*Quercus lobata*), which grows on deep, alluvial soils on the Central Valley floor, and blue oak (*Q. douglasii*), which occurs on shallow soils and in xeric areas at higher elevations. California buckeye (*Aesculus californicus*) often occurs within oak savanna; its flowers provide an important nectar source for butterfly and hummingbirds. The shrubby understory in oak savanna typically consists of poison oak (*Toxicodendron diversalobum*), gooseberries (*Ribes* spp.), and/or toyon (*Heteromales arbutifolia*). However, the assessment area is grazed by livestock; therefore this understory is poorly developed and consists primarily of nonnative grasses and forbs. On the assessment area, oak savanna includes several patches of scattered oaks, approximately 5-10 acres in total in five multi-tree patches (not counting single trees).

#### *3.3.2.2 Oak Woodland*

Oak woodland is one of the dominant plant communities in the Vaca Mountains at the eastern edge of the Coast Range and typically consists of a denser tree cover and understory than oak savanna. The canopy cover in oak woodland communities ranges from 30 to 100 percent, depending on the aspect of the woodland; on moist, north-to-east-facing slopes the cover is greater than on dry, south-to-west-facing slopes. Species composition will also vary according to aspect and water availability. Coast live oak (*Q. agrifolia*) and blue oak commonly dominate oak woodlands of Solano County. Other broad-leaved, evergreen, or deciduous trees, including interior live oak (*Q. wislezenii*), black oak (*Q. kelloggii*), California bay (*Umbellularia californica*), California buckeye, toyon, and walnut (*Juglans* spp.), are common associates in or at the edges of oak woodlands. Along ravines, California coffeeberry (*Frangula californica*) can be found. The largest area of solid oak woodland is located in the northern portion of the property, spanning two drainages that lead to the two stock ponds on the site. The oak woodland patch measures approximately 27 acres and includes two riparian areas. Trees within the riparian corridor are typically very large, mature individuals.

### 3.3.3 Riparian Habitat

The site borders to the north on the English Creek and to the west to Gibson Creek, a deeply incised intermittent stream. The streambed is gravel, cobble, and bedrock, and the channel sides are steep. The predominant vegetation along the stream is valley oak, interior live oak, California bay laurel, toyon, and abundant poison oak.

# 4.0 SENSITIVE RESOURCES

## 4.1 CNDDB RECORDS

In this assessment, special-status species are considered to be those species listed as threatened or endangered under the California and/or federal Endangered Species Act, California species of special concern (CDFW 2018), and plants with a California rare plant rank of 1 or 2 (CNPS 2018). Project-related impacts to such species are considered "significant" under CEQA Guidelines (ACEC 2018), and projects with unavoidable significant impacts to these species must provide mitigation. The CNDDB lists 9 plant species, 6 birds, 1 mammal, 2 reptiles, 3 amphibians, 1 fish, and 3 invertebrates as potentially present within 5 miles of the assessment area (Table B).

### 4.1.1 Plants

No special-status plants were observed onsite during the reconnaissance survey. Timing of the survey was late for most species however.

> ***Recommendation***: Appropriately timed surveys should be conducted of the development area prior to issuance of a grading permit. The survey area should be the area of the development envelope (e.g., house, barns, landscaping), internal access roads/driveways, and any other conversions of suitable habitat for listed plants (e.g., ponds). Special-status plants populations should be avoided during development of the lots.

**Table B: Special-status Species within 5 Miles of the Project Site**

| Name | Presence | Federal Status[6] | State Status[1] | Rare Plant Rank[7] | CDFW Status[8] |
|---|---|---|---|---|---|
| **PLANTS** | | | | | |
| Adobe-lily<br>*Fritillaria pluriflora* | Not likely to occur | -- | -- | 1B.2 | -- |
| Baker's navarretia<br>*Navarretia leucocephala* ssp. *bakeri* | Not likely to occur | -- | -- | 1B.1 | -- |
| Bearded popcornflower<br>*Plagiobothrys hystriculus* | Not likely to occur | -- | -- | 1B.1 | -- |
| Brewer's western flax<br>*Hesperolinon breweri* | Not likely to occur | -- | -- | 1B.2 | -- |
| Dwarf downingia<br>*Downingia pusilla* | Not likely to occur | -- | -- | 2B.2 | -- |

[6] E= Endangered, T=Threatened

[7] California Rare Plant Ranks: 1A. Presumed extirpated in California and either rare or extinct elsewhere; 1B. Rare or Endangered in California and elsewhere; 2A. Presumed extirpated in California, but more common elsewhere; 2B. Rare or Endangered in California, but more common elsewhere; 3. Plants for which more information is needed - Review list; 4. Plants of limited distribution - Watch list. N/A Not applicable

[8] CDFW Status: SSC= Species of Special Concern; Species experiencing declining population levels, limited ranges, and/or continuing threats; FP=Fully protected, may not be taken or possessed at any time.

| Name | Presence | Federal Status[6] | State Status[1] | Rare Plant Rank[7] | CDFW Status[8] |
|---|---|---|---|---|---|
| Lobb's aquatic buttercup<br>*Ranunculus lobbii* | Not likely to occur | -- | -- | 4.2 | -- |
| Mt. Diablo fairy-lantern<br>*Calochortus pulchellus* | Not likely to occur | -- | -- | 1B.2 | -- |
| Recurved larkspur<br>*Delphinium recurvatum* | Not likely to occur | -- | -- | 1B.2 | -- |
| Two-fork clover<br>*Trifolium amoenum* | Not likely to occur | E | -- | 1B.1 | -- |
| **ANIMALS** | | | | | |
| **Birds** | | | | | |
| American white pelican<br>*Pelecanus erythrorhynchos (nesting colony)* | Observed on stock pond | -- | -- | N/A | SSC |
| Burrowing owl<br>*Athene cunicularia* | Foraging habitat, wintering habitat, some potential nesting habitat | -- | -- | N/A | SSC |
| Northern Spotted owl<br>*Strix occidentalis* | No suitable habitat | T | T | N/A | -- |
| Swainson's hawk<br>*Buteo swainsoni* | Foraging habitat, some potential nesting habitat | -- | T | N/A | -- |
| White-tailed kite<br>*Elanus leucurus* | Foraging habitat, some potential nesting habitat | -- | -- | N/A | FP |
| **Mammals** | | | | N/A | |
| American badger<br>*Taxidea taxus* | Potentially present | -- | -- | N/A | SSC |
| **Reptiles** | | | | | |
| Western pond turtle<br>*Emys marmorata* | Suitable habitat (stock pond) | -- | -- | N/A | SSC |
| Giant Garter Snake<br>*Thamnophis gigas* | No suitable habitat | -- | -- | N/A | -- |
| **Amphibians** | | | | | |
| Foothill yellow-legged frog<br>*Rana boylii* | Not likely to occur | -- | C | N/A | SSC |
| California Red-legged Frog<br>*Rana draytonii* | No suitable breeding or larval habitat | T | -- | N/A | -- |
| California Tiger Salamander<br>*Ambystoma californiense* | Outside current range, grasslands do not provide upland habitat | T | T | N/A | -- |
| **Fish** | | | | | |
| Delta Smelt<br>*Hypomesus transpacificus* | No suitable habitat | T | -- | N/A | -- |
| **Invertebrates** | | | | | |
| Vernal pool fairy shrimp<br>*Branchinecta lynchi* | No suitable habitat | T | -- | N/A | -- |
| Vernal pool tadpole shrimp<br>*Lepidurus packardi* | No suitable habitat | E | -- | N/A | -- |
| Valley elderberry longhorn beetle<br>*Desmocerus californicus dimorphus* | No elderberry shrubs were identified onsite | T | -- | N/A | -- |

## 4.1.2 Animals

### *4.1.2.1 Swainson's Hawk*

Historically, the Swainson's hawk was found in grassland and shrublands across Midwestern and western North America from the northern Great Plains of Canada to semi-desert areas of northern Mexico. Recently, it has declined throughout much of its range including the Canadian prairies, Nevada, Oregon, and California (England et al. 1997). Several factors are thought to have contributed to this decline, including changes in agricultural practices, degradation and loss of nesting and foraging habitat, reduced prey numbers, and urban sprawl (England et al. 1997).

Swainson's hawk nest in mature trees in proximity to foraging habitat, such as agricultural croplands, pastures and grasslands. Swainson's hawks are sensitive to habitat fragmentation, and foraging use declines as suitable foraging patch size decreases even though suitable prey conditions may exist (Estep and Teresa 1992). The land use designation of the parcel is agriculture in the 2008 General Plan.

The presence of California ground squirrels and other fossorial rodents at the project site provides foraging habitat for raptors, including Swainson's hawk. There are numerous potential nest trees for raptors on the project site. At the time of the site visit, most Swainson's hawks had already migrated to wintering grounds in Central and South America. A recently active (2016) Swainson's hawk nest is located 2.15 miles to the southeast of the project area, near the intersection of Vaca Valley Parkway with I-505. Swainson's hawk are also reported to nest north of the property north although the specific locations have not been published. The project site is within the normal foraging radius of this nest, as Swainson's hawk is highly mobile and can forage up to 18 miles from the nest (Estep 1989; Babcock 1993).

The resulting 20-acre homesites, with associated gardens, fences, and driveways, are considered unsuitable foraging habitat for Swainson's hawk, as the species requires larger parcels of open grassland or agricultural fields for hunting. Impacts to Swainson's hawk foraging habitat should be mitigated according to the 2008 General Plan EIR.

> ***Recommendation***: Mitigation for loss of foraging habitat is typically required for loss of foraging habitat. The area subject to mitigation should be the area of the development envelope (e.g., house, barns, landscaping), internal access roads/driveways, and any other conversions of suitable Swainson's hawk foraging habitat (e.g., ponds). A 1:1 (mitigation: impact) ratio is a typical requirement for loss of foraging habitat and is consistent with Mitigation Measure 4.6-1a of the 2008 Solano County Draft EIR. Limiting structures (houses, barns, out- buildings, roads, etc.) to no more than 30% of a parcel and 20% for corrals/paddocks less than 1 acre and/or orchards and vineyards, would be achieve a 1:1 ratio for maintaining foraging habitat on the property. .

### *4.1.2.2 Burrowing Owl*

Habitat loss and degradation from rapid urbanization of farmland in the core areas of the Central Valley is the greatest of many threats to burrowing owls in California (Shuford and Gardalis 2008). Thus, CDFW (2012) has developed mitigation guidelines for burrowing owls that are affected by

development. However, no burrowing owl, active burrows, or burrowing owl signs were observed during the reconnaissance-level wildlife and vegetation survey. The site has California ground squirrel (*Otospermophilus beecheyi*) burrows in multiple locations, which could provide suitable nesting burrows for burrowing owl. The natural grasslands at the site are suitable foraging and wintering habitat for burrowing owl, although the current vegetation height is high and therefore not suitable for the species.

> ***Recommendation*:** CDFW mitigation guidelines require that if burrowing owls have been documented to occupy the project site in recent years, mitigation should be required by the CEQA lead agency to address project-specific significant and cumulative impacts. Therefore, prior to development of each lot, a protocol-level burrowing owl survey should be conducted in all areas of the lot subject to ground disturbance. Mitigation according to CDFW guidelines should be provided prior to issuance of a grading permit if burrowing owls are observed breeding or wintering onsite.

#### *4.1.2.3 American Badger*

American badger could be present, although no badgers or their burrows were observed. Badger require friable, sandy soils for burrowing. The soil types with the highest sand percentage (Gaviota sandy loam, 66.8%) and soils of the Millsholm series (39-44% sand) are suitable badger habitat; these soil types comprise approximately 42% of the assessment area.

> ***Recommendation*:** Areas proposed for development should be surveyed prior to ground-disturbing activities and a monitoring plan should be implemented to keep badgers out of the development area during construction.

#### *4.1.2.4 Western Pond Turtle*

LSA did not observe western pond turtle (*Emys marmorata*) at the large stock pond; however, the ponds and creeks provide potential western pond turtle aquatic habitat while the adjacent grasslands provide suitable upland habitat for breeding. Western pond turtles require ponds that are free of nonnative fish and bullfrogs, due to the high vulnerability of hatchling turtles to predation.

> ***Recommendation:*** Preconstruction surveys for pond turtles should be carried out prior to work in any creek or pond on the subdivided property. A plan to remove turtles should be implemented as part of any creek or pond work.

#### *4.1.2.5 Loss of Value of Upland Grassland, Oak Woodland, Oak Savanna, and Scrub/Chaparral Habitats*

Subdivision of the property and development of the lots will result in the loss and overall habitat values of the site through conversion of natural habitats to development, removal of trees, fencing of the site, and general disturbance.

> ***Recommendation:*** Mitigation Measure 4.6-2a of the 2008 General Plan EIR should be implemented to mitigate for the loss and reduced value of grassland and woodland habitats

onsite. Under this measure a habitat inventory and assessment of the site should be conducted, mitigation and management plan be prepared, and tree replacement and monitoring implemented.

## 4.2 CRITICAL HABITAT

There are no designated critical habitats at this location.

## 4.3 MOVEMENT CORRIDORS

The project site has currently no interior barriers to wildlife movement. It is fenced with wildlife permeable fencing on the perimeter and is cross-fenced, although the quality of the fences is poor. The site itself is located in between two major drainages, the English Creek and Gibson Canyon Creek. The relatively large size of the project site and its position along two major creek drainages makes it a suitable migration habitat for species moving along existing migration corridors, such as the English Creek and along the Steiger Hills Road. These drainages, including the oak woodlands and riparian habitat of the project site, are heavily used by highly mobile species such as deer, coyote, raccoon (*Procyon lotor)*, and turkey, which all have been observed at the project site. If the site is subdivided into residential lots, the unfettered movement of wildlife species through the site could be reduced due to the presence of additional fences, buildings, presence of pet dogs, and general disturbance.

> ***Recommendation*:** Wildlife-friendly fencing should be required for all fencing of the subdivided parcels. Avoid development within riparian buffers to allow wildlife to move freely along the creeks.

## 4.4 OTHER WILDLIFE

Wildlife or wildlife sign observed on or near the project site consisted of species typical of annual grassland and wooded habitats in Solano County, including turkey vulture (*Cathartes aura*), turkey (*Meleagris gallopavo intermedia*), oak titmouse (*Baeolophus inornatus*), acorn woodpecker (*Melanerpes formicivorus*), California scrub-jay (*Aphelocoma californica*), common raven (*Corvus corax*), northern mockingbird (*Mimus polyglottos*), American crow (*Corvus brachyrhynchos*), mourning doves (*Zenaida macroura),* California towhee (*Melozone crissalis*), and Anna's hummingbird (*Calypte anna*). In addition, a flock of American white pelicans (*Pelecanus erythrorhynchos*) and Canada geese (*Branta canadensis*) were observed at the stock pond. Coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), black-tailed deer (*Odocoileus hemionus*), and western fence lizard (*Sceloporus occidentalis)* were observed on the site. Destruction or interfering with active nests is prohibited under the federal Migratory Bird Treaty Act and the California Fish and Game code. Preconstruction should be conducted no more than 2 weeks prior to the initiation of construction activities on the individual lots. Results should be provided to the County.

> ***Recommendation*:** Conduct preconstruction surveys for nesting birds if ground-disturbing activities occur between February 1 and August 31. Avoid active nests by establishing buffer zones around nests in which no activity is allowed until the young have fledged from the nest. A biologist should monitor buffers periodically.

## 4.5 POTENTIAL JURISDICTIONAL WATERS OF THE UNITED STATES

Potential jurisdictional features and sample point locations are shown on Figure 3 in Appendix B. The dimensions of potential jurisdictional features are presented in Table C. Brief descriptions of the features onsite are included in Appendix B. All determinations such as those in Figure 1 in Appendix B and the sections below are considered preliminary until verified by the Corps.

> ***Recommendation*:** Features that are identified as jurisdictional under Section 404 of the Clean Water Act by the United States Army Corps of Engineers (Corps) will be subject to regulation. Placement of fill in such features as part of the development of a subdivided lot will require a permit and mitigation according to Corps mitigation guidelines. Mitigation is typically required at a minimum of 1:1 (mitigation: impact) ratio. Aquatic features may also be subject to regulation by the Regional Water Quality Control Board and the California Department of Fish and Wildlife. The lot owner should provide proof of permits to the County prior to issuance of a grading permit.

### Table C: Summary of Potentially Jurisdictional Waters of the United States

| | Length (linear feet rounded to nearest 10) | Width (linear feet) | Area (square feet rounded to nearest 10) | Area (acre) |
|---|---|---|---|---|
| **Potential Jurisdictional Tributaries (incl. Potentially Jurisdictional Ditches and Culverts)** | | | | |
| Tributary Segment A-1 | 110 | 1 | 110 | 0.00 |
| Tributary Segment A1-1 | 90 | 1 | 90 | 0.00 |
| Tributary Segment A-2 | 200 | 1 | 200 | 0.00 |
| Tributary Segment B-1 | 100 | 1 | 100 | 0.00 |
| Tributary Segment (Culvert) B-2 | 70 | 1 | 70 | 0.00 |
| Tributary Segment B-3 | 60 | 1 | 60 | 0.00 |
| Tributary Segment C-1 | 220 | 1 | 220 | 0.01 |
| Tributary Segment D-1 | 120 | 1 | 120 | 0.00 |
| Tributary Segment D1-1 | 170 | 1 | 170 | 0.00 |
| Tributary Segment (Culvert) D1-2 | 20 | 1 | 20 | 0.00 |
| Tributary Segment D1-3 | 270 | 1 | 270 | 0.01 |
| Tributary Segment D1-4 | 460 | 1 | 460 | 0.01 |
| Tributary Segment D-2 | 270 | 1 | 270 | 0.01 |
| Tributary Segment E-1 | 240 | 1 | 240 | 0.01 |
| Tributary Segment E2-1 | 60 | 1 | 60 | 0.00 |
| Tributary Segment (Culvert) E-2a | 30 | 2 | 50 | 0.00 |
| Tributary Segment (Culvert) E-2b | 50 | 1.5 | 70 | 0.00 |
| Tributary Segment E-3 | 540 | 1 | 540 | 0.01 |
| Tributary Segment (Culvert) E-4 | 30 | 2 | 50 | 0.00 |
| Tributary Segment E-5 | 280 | 2 | 560 | 0.01 |
| Tributary Segment E-6 | 150 | 1 | 150 | 0.00 |
| English Creek | 600 | 10 | 5,960 | 0.14 |
| Tributary Segment F-1 | 100 | 3 | 290 | 0.01 |
| Tributary Segment G-1 | 100 | 3 | 290 | 0.01 |
| Tributary Segment (Culvert) G-2 | 30 | 2 | 60 | 0.00 |
| Tributary Segment (Culvert) H-1 | 10 | 2 | 10 | 0.00 |
| Tributary Segment H1.1-1 | 80 | 1 | 80 | 0.00 |
| Tributary Segment H1-1 | 150 | 1 | 150 | 0.00 |

| | Length (linear feet rounded to nearest 10) | Width (linear feet) | Area (square feet rounded to nearest 10) | Area (acre) |
|---|---|---|---|---|
| Tributary Segment H-2 | 220 | 1 | 220 | 0.01 |
| Tributary Segment H2-1 | 110 | 3 | 320 | 0.01 |
| Tributary Segment H2-2 | 90 | 1 | 90 | 0.00 |
| Tributary Segment H3.1-1 | 110 | 2 | 220 | 0.01 |
| Tributary Segment H3-1 | 220 | 1 | 220 | 0.00 |
| Tributary Segment H3-2 | 390 | 1 | 390 | 0.01 |
| Tributary Segment H-4 | 1,740 | 6 | 10,430 | 0.24 |
| Tributary Segment H4.1-1 | 60 | 1 | 60 | 0.00 |
| Tributary Segment H4-1 | 50 | 1 | 50 | 0.00 |
| Tributary Segment H-5 | 90 | 4 | 350 | 0.01 |
| Tributary Segment H5-1 | 20 | 1 | 20 | 0.00 |
| Tributary Segment H-6 | 310 | 4 | 1,240 | 0.03 |
| Tributary Segment H6-1 | 70 | 1 | 70 | 0.00 |
| Tributary Segment H-7 | 100 | 1 | 100 | 0.00 |
| Tributary Segment H-8 | 110 | 1 | 110 | 0.00 |
| Tributary Segment (Culvert) I-1 | 30 | 3 | 90 | 0.00 |
| Tributary Segment I1-1 | 30 | 1 | 30 | 0.00 |
| Tributary Segment I2.1-1 | 200 | 1 | 200 | 0.00 |
| Tributary Segment I2-1 | 430 | 1 | 430 | 0.01 |
| Tributary Segment I-3 | 470 | 1 | 470 | 0.01 |
| Tributary Segment I3-1 | 70 | 1 | 70 | 0.00 |
| Tributary Segment I4-1 | 330 | 1 | 330 | 0.01 |
| Tributary Segment i5.1-1 | 50 | 1 | 50 | 0.00 |
| Tributary Segment I5-1 | 90 | 1 | 90 | 0.00 |
| Tributary Segment I5-2 | 70 | 1 | 70 | 0.00 |
| Tributary Segment I5-3 | 250 | 1 | 250 | 0.01 |
| Tributary Segment J1.1-1 | 120 | 1 | 120 | 0.00 |
| Tributary Segment J1.2.1-1 | 50 | 1 | 50 | 0.00 |
| Tributary Segment J1.2-2 | 160 | 1 | 160 | 0.00 |
| Tributary Segment J1-1 | 520 | 4 | 2,080 | 0.05 |
| Tributary Segment J1-3 | 70 | 1 | 70 | 0.00 |
| Tributary Segment J1-6 | 150 | 1 | 150 | 0.00 |
| Tributary Segment J-2 | 490 | 8 | 3,920 | 0.09 |
| Tributary Segment J2-2 | 90 | 2 | 180 | 0.00 |
| Tributary Segment J3-1 | 210 | 1 | 210 | 0.00 |
| Tributary Segment J-4 | 50 | 3 | 160 | 0.00 |
| Tributary Segment J-6 | 220 | 3 | 670 | 0.02 |
| Tributary Segment J-7 | 260 | 3 | 780 | 0.02 |
| Tributary Segment L-1 | 670 | 2 | 1,340 | 0.03 |
| Tributary Segment M-1 | 90 | 2 | 180 | 0.00 |
| Tributary Segment M1-1 | 330 | 1 | 330 | 0.01 |
| Tributary Segment (Culvert) M-2 | 10 | 1 | 10 | 0.00 |
| Tributary Segment M-3 | 50 | 2 | 90 | 0.00 |
| Tributary Segment M-5 | 480 | 2 | 960 | 0.02 |
| Tributary Segment N-1 | 160 | 1 | 160 | 0.00 |
| Tributary Segment N-2 | 160 | 1 | 160 | 0.00 |
| Tributary Segment N2-1 | 90 | 1 | 90 | 0.00 |
| Tributary Segment N2-2 | 50 | 1 | 50 | 0.00 |
| Tributary Segment N-4 | 290 | 1 | 290 | 0.01 |

| | Length (linear feet rounded to nearest 10) | Width (linear feet) | Area (square feet rounded to nearest 10) | Area (acre) |
|---|---|---|---|---|
| Tributary Segment O-1a | 970 | 2 | 1,940 | 0.04 |
| Tributary Segment O-1b | 100 | 1 | 100 | 0.00 |
| **Potential Jurisdictional Adjacent Waters** | | | | |
| Seasonal Swale Wetland SSW N-3 | - | - | 38,850 | 0.89 |
| Seasonal Wetland SW M-4 | - | - | 1,120 | 0.03 |
| Seasonal Swale Wetland Complex SSW J-1 | - | - | 37,370 | 0.86 |
| Seasonal Swale Wetland SSW K-1 | - | - | 14,600 | 0.34 |
| Seasonal Swale Wetland Complex SSW J1 | - | - | 5,080 | 0.12 |
| Seasonal Swale Wetland Complex SSW J2-1, J3, and J-5 | - | - | 16,410 | 0.38 |
| **Potential Jurisdictional Impoundments** | | | | |
| Stock Pond I-2 | - | - | 68,390 | 1.57 |
| Stock Pond H-3 | - | - | 25,693 | 0.59 |
| **SUMMARY** | | | | |
| Tributaries, Ditches, Culverts | 16,990 | - | 42,400 | 0.97 |
| Adjacent Waters | - | - | 113,430 | 2.60 |
| Impoundments | - | - | 94,083 | 2.16 |
| **All Potential Jurisdictional Features** | | | **248,453** | **5.70** |

## 4.6 OTHER FEATURES POTENTIALLY EXCLUDED FROM CORPS JURISDICTION

### 4.6.1 Features Caused by Leaking or Overflow of the Ranch Water System

#### *4.6.1.1 Overflow Feature 1*

Overflow Feature 1 is located at the southeastern corner of the assessment area near Tributaries N-1 and N-2. A PVC pipe appears to continuously deliver water to a cattle trough at this location. Due to prolonged leaking and/or overflow from the trough, 4,380 square feet (0.1 acre) of prolonged saturation have developed. Plant species growing in this wet spot include spiny cocklebur, rabbitsfoot grass, swamp grass, Bermuda grass, Italian thistle, and Italian ryegrass. It is anticipated that the potential wetland characteristics of this area will disappear once leaking or overflow from this ranch water infrastructure is stopped. Therefore, LSA believes this area may not qualify as a water of the United States as defined in the Clean Water Rule.

#### *4.6.1.2 Leak Feature 1*

Leak Feature 1 is located upslope from Seasonal Swale Wetland Complex J-1 (SSW J-1). A PVC pipe delivers water to a cattle trough to the east of this feature. Due to prolonged leaking from the pipe, 2,060 square feet (0.05 acre) of prolonged saturation and erosion have developed. It is anticipated that the potential wetland characteristics of this area will disappear once leaking is stopped. Therefore, LSA believes this area may not qualify as a water of the United States as defined in the Clean Water Rule.

### 4.6.2 Erosional Features

The assessment area includes dozens of erosional features disconnected from head-water tributaries. These features can be identified from aerial imagery and are predominantly located on steeper slopes or between steep slopes. These features include a range of sizes from small slides to

large gullies. No hydrophytic plant species were observed in these features. Where a hydrological connection to a first order tributary has developed, and bed, bank, and OHWM have developed, these gullies/tributaries were included as aquatic resources (Table C). All other purely erosional features are assumed not to qualify as waters of the United States under the Clean Water Rule.

### 4.6.3 Roadside Ditch

Several excavated ditches and one culvert are associated with the western access road (Features E1-1 to E1-3, and D3; Figure 3). The ditches may convey ephemeral flow, and some sections are lined with gravel, however no clear OHWM was observed. No wetland plants were observed growing in the ditch. The ditches are not located in a tributary or replace a tributary.

These ditches are excavated wholly in and drain only uplands; do not appear to carry a relatively permanent flow of water, and are therefore considered excluded from the definition of waters of the U.S. In extension, culvert E1-2, which is associated with the roadside ditch, is therefore also considered to be excluded from the definition of waters of the U.S.

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# 5.0 LOCAL POLICIES AND ORDINANCES PROTECTING BIOLOGICAL AND AGRICULTURAL RESOURCES

Local policies protecting biological resources that are relevant to the proposed project include:

## 5.1 WILLIAMSON ACT

The project site appears to not have been enrolled in the Williamson Act.

## 5.2 SOLANO COUNTY GENERAL PLAN

The Solano County General Plan addresses conversion of agricultural land to other uses in AG Policy AG.P-4, which requires farmland conversion mitigation for either of the following actions: a. a General Plan amendment that changes the designation of any land from an agricultural to a nonagricultural use or b. an application for a development permit that changes the use of land from production agriculture to a nonagricultural use, regardless of the General Plan designation. The General Plan's Policy RS.P-5 also protects wildlife movement corridors to ensure the health and long-term survival of local animal and plant populations. It aims to preserve contiguous habitat areas to increase habitat value and to lower land management costs. Finally, Policy RS.P-6 addresses oak woodlands and heritage tree protection, through the adoption of an ordinance to protect oak woodlands as defined in Senate Bill (SB) 1334 and heritage oak trees. The Plan defines heritage trees as the following: (a) trees with a trunk diameter of 15 inches or more measured at 54 inches above natural grade, (b) any oak tree native to California, with a diameter of 10 inches above natural grade, or (c) any tree or group of trees specifically designated by the County for protection because of its historical significance, special character, or community benefit.

The following is a summary of current oak protection policies of Solano County:[9]

1. Resource Conservation and Open Space Element, 1999
    a. **Riparian Vegetation:** Natural watercourses should be protected in their natural state. Permanent structures should be prohibited within floodplains. Preservation of natural vegetation should be required. Development on slopes >6% should avoid loss of natural vegetation. An amendment to prohibit destruction or degradation of any fish and wildlife habitat, including riparian vegetation, should be adopted. A grading ordinance should be adopted.
    b. **Wildlife Habitat:** A Watershed Preservation and Management Zone should be adopted for higher elevations.
2. Land Use Element, 1995
    a. The Land Use Element designates policies to maintain natural resources including agricultural land, soils, water, minerals, wetlands, and scenic corridors, but does not include oaks or oak woodlands on the list.

[9] Web site: http://www.solanocounty.com/Department/Department.asp?NavID=84

3. Zoning Ordinance, Chapter 28

    a. This ordinance establishes watershed and conservation districts in areas of fire hazard and slope instability with steep topography (defined as slopes in excess of twenty-five percent grade) and excessive vegetation coverage (at least 50% chaparral or woodland). The minimum building parcel area required shall be 160 acres (28-37).

4. Subdivision Ordinance, Chapter 26, 2001

    a. In subdivisions in hillsides and visually sensitive areas, stands of native vegetation should be maintained within residential development. Building and grading areas shall be shown on tentative maps, as well as all trees >/6" in diameter 3' above the ground in building, road, and cut and fill areas.

# 6.0 CONCLUSIONS

The proposed project involves the rezoning and subdivision of a 305-contiguous-acre property into 15, 20-acre parcels. The subdivision creates a fragmentation of the site on paper, but it is only upon development of each lot by the individual owners that the potential adverse effects of fragmentation would be realized. Therefore, LSA's recommendations are tied to future development of the lots and not the subdivision itself.

LSA conducted a biological resources assessment of the site in late summer 2018. During the field survey and database searches, a number of sensitive species and habitats were either documented from the site in past surveys, identified directly onsite through observation of the animals or its sign (i.e., scat, tracks, fur, skeletal remains), or presumed to occupy the site based on geographic range and presence of suitable habitat.

## 6.1 SENSITIVE SPECIES

Although no sensitive plant species were observed onsite, the lateness of the reconnaissance survey in the blooming season makes it possible that such plants were not identifiable at the time of the survey. Preconstruction surveys are recommended prior to any ground-disturbing activities on the lots. Special-status plant populations should be avoided during lot development.

Swainson's hawks and burrowing owls likely forage on the site. Burrowing owls may also nest or winter onsite in the abundant ground squirrel burrows. Individual lot owners should be required to mitigate for the removal of suitable habitat prior to initiation of ground-disturbing activities on the individual lots.

Preconstruction surveys should be conducted before grading or tree trimming commences. Preconstruction surveys for nesting birds should be conducted if development activities occur between February 1 and August 31. Special-status species encountered in the work area should be allowed to fledge young (i.e., birds) or move out of the area before work starts (e.g., badgers). In some cases, a biological monitor should move the animal out of the work area (e.g., turtles).

## 6.2 MOVEMENT CORRIDORS

The project would not substantially interfere with the movement of any native resident or migratory fish species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. To minimize the effects of fragmentation on the 305-acre site, wildlife permeable fencing such as three-strand barbed wire fencing should be required for all fencing of the subdivided parcels. Solid fencing may be used around houses and private areas.

## 6.3 JURISDICTIONAL AREAS

Areas determined to be jurisdictional under the Clean Water Act will be subject to regulation. Placement of fill in such features will require permits from the Corps, RWQCB, and CDFW. Mitigation is typically required as part of the permit process.

## 6.4 LOCAL PLANS AND POLICIES

Development of the 20-acre sites may result in potential conflict with local policies that address conversion of farmland to non-farm uses, and protection of oak woodlands and heritage oak trees, and wildlife movement.

# 7.0 REFERENCES

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# FIGURES

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Figure 1: Location Map

Figure 2: Topography

Figure 3: Soil Map

Figure 4: Vegetation Communities and Habitat Types

# APPENDIX A

# SITE PHOTOGRAPHS

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# SITE PHOTOGRAPHS

Photo 1: Typical annual grasslands of the assessment area.

Photo 2: Typical annual grassland on ridgetops.

Photo 3: Typical annual grassland with interspersed oak savanna and oak woodlands.

Photo 4: Oak savanna, consisting of grassland with interspersed blue oak (*Quercus douglasii*) and California buckeye (*Aesculus californicus*).

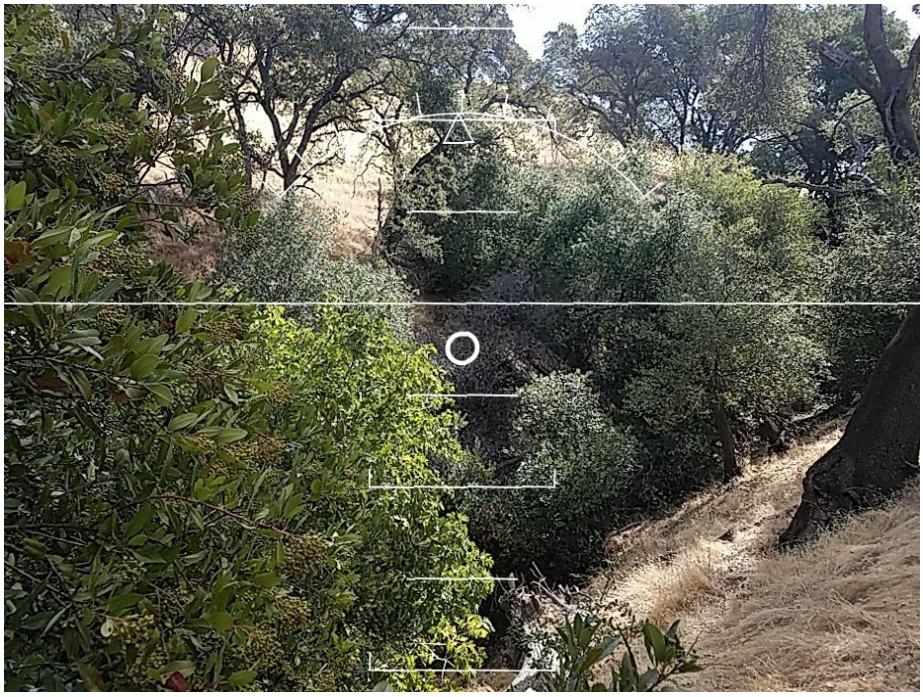

Photo 5: Oak woodlands with mature valley oak, and California coffeeberry (*Frangula californica*) as understory.

Photo 6: Riparian habitat, along English Creek.

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# APPENDIX B

# CLEAN WATER ACT JURISDICTIONAL DELINEATION

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# CLEAN WATER ACT JURISDICTIONAL DELINEATION

**LAND OF MORGAN**

**SOLANO COUNTY, CALIFORNIA**

LSA

February 2019

# CLEAN WATER ACT JURISDICTIONAL DELINEATION

**LAND OF MORGAN**

**SOLANO COUNTY, CALIFORNIA**

Submitted to:

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Project No. WIM1801

LSA

February 2019

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## TABLE



## APPENDICES

# INTRODUCTION

At the request of William Morgan, LSA Associates, Inc. (LSA) has completed a delineation of potential waters of the United States for the proposed Subdivision of the Lands of Morgan (Project). The Project consists of subdividing rural agricultural property into 15 residential lots (approximately 20 acres each) and rezoning one lot (Assessor's Parcel Number 105-170-110) from A-20 to RR2.5. The Project further includes two proposed 60-foot-wide roads, building sites, and leach field locations.

# STUDY AREA DESCRIPTION

## LOCATION

The approximately 300-acre Study Area for this Jurisdictional Delineation is located north of the City of Vacaville, Solano County, California, and includes Solano County Assessor's Parcel Numbers 105-110-070, 105-110-100, 105-110-440, 105-110-450, 105-160-130, 105-170-010, and 105-170-150. The Study Area is centered around 38° 24' 44"N and 121° 59' 58"W. It borders Gibson Canyon Road to the east and Cantelow Road and the adjacent South Fork of English Creek to the north and northwest. The regional location of the Project and Study Area is shown on Figure 1, and the Study Area is shown on Figures 2 and 3 (all figures are in Appendix A).

## VEGETATION COMMUNITIES

The site is located in the Inner Coast Range Natural Community. The overall landscape consists of grasslands dominated by non-native annual grassland species, scattered stands of native and nonnative trees, and primarily woody riparian corridors.

The upland grassland areas are dominated by non-native annual grassland species, most commonly wild oats (*Avena fatua*), medusahead (*Teaniatherum caput-medusae*), rip-gut brome (*Bromus diandrus*), soft chess (*B. hordeaceus*), foxtail chess (*Hordeum murinum*), and Italian ryegrass (*Festuca perennis*). Ruderal forb species, including yellow starthistle (*Centaurea solstitialis*), Italian thistle (*Carduus pycnocephalus*), and prickly lettuce (*Lactuca serriola*), occur in previously disturbed areas, such as cattle concentration areas, fences, and roads.

Hydrophytic vegetation occurs at wetland areas and is discussed in greater detail for each wetland in the Observations section below.

Predominant vegetation associated with the main tributaries includes valley oak (*Quercus lobata*), California bay laurel (*Umbellularia californica*), interior live oak (*Quercus agrifolia*), toyon (*Heteromeles arbutifolis*), and poison oak (*Toxicodendron diversilobum*).

## TOPOGRAPHY AND HYDROGEOMORPHOLOGY

The Study Area is within the English Hills area, a low mountain range in northern Solano County, which is part of the Coast Range. The Study Area is characterized by steep hills, with elevations ranging from 280 feet above sea level along English Creek to over 580 feet. Bedrock in this geographical province is dominated by Cretaceous marine sedimentary units, with smaller inclusions of Tertiary sedimentary and basic igneous rocks. These units form ridges with intervening narrow valleys that trend northwest.

The Study Area includes two watersheds:

- The northwestern portion of the Study Area is part of the McCune Creek-Sweany Creek EPA Hydrological Unit and is referred to as the northwestern watershed in this report. This portion of

the Study Area drains via a network of unnamed head-water tributaries to English Creek, a USGS blue-line feature.

- The southeastern portion of the Study Area is part of the Gibson Canyon Creek-Sweany Creek EPA Hydrological Unit and is referred to in this report as the southeastern watershed. This portion of the Study Area drains via a network of unnamed head-water tributaries and swales to Gibson Canyon Creek, a USGS blue-line feature.

Both English Creek and Gibson Canyon Creek drain via a number of canals and other tributaries to the Sacramento River, a navigable water of the United States.

## SOILS

The primary soil types in the Vacaville area are silty, sandy, and clay loams, with a smaller portion being made up of purely clay soils. In the assessment area, the primary soil types are Altamont clays (23%), Dibble-Los Osos loams (24%), and Millsholm loam (41%). Altamont soils are the most clay-rich soils (up to 46%), followed by Ricon loams (33-37%), Dibble-Los Osos loams (31-33%), and Millsholm loams (14-23%). These soils have significant shrink-swell potential, evident in large cracks at the surface during the summer. Erosion potential of soils in the assessment area is generally modest to high, predominantly due to the steep slopes. These soils are all upland soils that are quite common in hilly terrain in Solano County. They are not normally hydric. These soils are grassland soils and normally have dark surface horizons due to incorporation of decomposing organic material.

# REGULATORY BACKGROUND

The U.S. Army Corps of Engineers (Corps) is responsible under Section 404 of the Clean Water Act (CWA) to regulate the discharge of fill material into waters of the United States. Waters of the United States and their lateral limits are defined in *Clean Water Rule: Definition of "Waters of the United States"* (33 Code of Federal Regulations [CFR] Part 328; published June 29, 2015). Waters of the United States as defined in the Clean Water Rule include Traditional Navigable Waters, Interstate Waters, Territorial Seas, Impoundments, Tributaries, Adjacent Waters, and Case-Specific Waters of the United States.

The lateral limits of jurisdiction for a tributary are measured at the line of the Ordinary High Water Mark (OHWM) or the limit of adjacent wetlands located within the floodplain. Any permanent extension of the limits of an existing water of the United States, whether natural or man-made (e.g., ditches or culverts), results in a similar extension of Corps jurisdiction.

The term wetland refers to areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands are considered jurisdictional if they fall under one of the categories of waters of the United States defined in the Clean Water Rule.

Waters and wetlands that cannot trace a continuous hydrological connection to a navigable water of the United States are not tributary to waters of the United States. These features can nevertheless qualify as jurisdictional Adjacent Waters, impoundments, or case-specific waters of the United States. Adjacent waters are generally considered jurisdictional if they significantly affect the chemical, physical, or biological integrity of traditional navigable waters, interstate waters, or the territorial seas.

In general, a Corps permit must be obtained before placing fill in wetlands or other waters of the United States. The type of permit depends on the acreage involved and the purpose of the proposed fill.

In addition, the California Regional Water Quality Control Board (RWQCB) has jurisdiction over wetlands and other Waters of the State under Section 401 of the CWA and the state Porter-Cologne Water Quality Control Act. Waters of the State are generally coincident with waters of the United States. An RWQCB Water Quality Certification must be obtained for discharges requiring Corps permits for fill and dredge discharges.

# METHODS

LSA Senior Biologist and certified wetland delineator Bernhard Warzecha investigated the Study Area on September 11, 12, and 19, 2018.

The presence of potential wetlands was determined following guidance of the *Corps of Engineers Wetlands Delineation Manual*[1] and the revised procedures in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region.*[2] This method assesses the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. All of these parameters must be satisfied for an area to be considered a jurisdictional wetland. Wetland indicator status of vegetation follows the *2016 National Wetland Plant List for the Arid West Region*.[3]

LSA established 12 sample points in the Study Area; field data sheets are included in Appendix B. CWA jurisdictional boundaries and sample point locations were mapped using a global positioning system (GPS) receiver capable of submeter accuracy. Wetland boundaries were determined by following a combination of the limits of hydrophytic plant species, the limits of observed wetland hydrology, and topographic breaks.

Potential Corps jurisdiction of observed wetlands, tributaries, ditches, and culverts was determined following the definitions in the 2015 Clean Water Rule and the *Technical Support Document for the Clean Water Rule: Definition of Waters of the United States*.[4] Specifically, tributaries were determined through presence of bed, bank, and OHWM and/or hydrological connectivity. OHWM was determined and characterized using definitions and guidance of *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States*.[5]

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

2 U.S. Army Corps of Engineers. 2008. *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.

3 Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published April 28, 2016. ISSN 2153 733X.

4 Technical Support Document for the Clean Water Rule: Definition of Waters of the United States. 2015. U.S. Army Corps of Engineers.

5 Lichvar, R.W., and S.M. McColley. 2008. A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States. U.S. Army Corps of Engineers.

# OBSERVATIONS

## POTENTIAL JURISDICTIONAL WATERS OF THE UNITED STATES

Potential jurisdictional features and sample point locations are shown on Figure 3. The dimensions of potential jurisdictional features are presented in Table A.

### Potential Jurisdictional Tributaries including Potential Jurisdictional Ditches and Culverts

Tributaries are defined as waters that contribute flow, either directly or through another water (including an impoundment), to a traditional navigable water, interstate water, or the territorial seas, and are characterized by the presence of physical indicators of bed and banks and OHWM.

All features listed in this section convey concentrated flow directly or indirectly to either English Creek or Gibson Canyon Creek. Both creeks drain via a number of canals and other tributaries to the Sacramento River, a traditional navigable water of the United States, and are therefore considered potential jurisdictional tributaries under the CWA.

*Tributary A.* The segments of Tributary A are identified as A-1, A1-1, and A-2 in Figure 3 and Table A. Tributary A is located in the northwestern watershed and drains to an unnamed tributary of English Creek. All reaches of Tributary A are characterized by bed, bank, and a 1-foot-wide OHWM. The OHWM determination is based on scour and sediment deposits. No water was present at the time of the survey, and all segments are considered ephemeral. Segments A1-1 and A-2 are first order head-water reaches. Segment A-2 is on the bottom of a 30- to 50-foot-wide erosional feature.

The entire Tributary A includes approximately 410 linear feet within the Study Area, resulting in approximately 410 square feet (0.01 acre) of potential jurisdictional waters of the United States.

*Tributary B including Culvert.* The segments of Tributary B are identified as B-1, B-2, and B-3 in Figure 3 and Table A. Tributary B is located in the northwestern watershed and drains directly to English Creek. Segments B-1 and B-3 are characterized by bed, bank, and a 1-foot-wide OHWM. The OHWM determination is based on scour and sediment deposits. No water was present at the time of the survey, and this tributary is considered an ephemeral head-water reach.

Segment B-2 consists of a 1-foot-wide corrugated metal pipe (culvert) under a ranch road, connecting Segment B-3 to B-1.

The entire Tributary B includes approximately 240 linear feet within the Study Area, for a total area of approximately 240 square feet (0.01 acre) of potential jurisdictional waters of the United States.

*Tributary C.* Tributary C is identified as C-1 in Figure 3 and Table A. Tributary C is located in the northwestern watershed and drains directly to English Creek. Tributary C is characterized by bed, bank, and a 1-foot-wide OHWM. The OHWM determination is based on scour and sediment deposits. No water was present at the time of the survey, and this tributary is considered an ephemeral head-water reach.

Tributary C includes approximately 220 linear feet within the Study Area, for a total area of approximately 220 square feet (0.01 acre) of potential jurisdictional waters of the United States.

*Tributary D including Ditch and Culvert.* The segments of Tributary D are identified as D-2 through D-3 in Figure 3 and Table A. Tributary D is located in the northwestern watershed and drains via an unnamed tributary to English Creek. All segments except the culvert are characterized by bed, bank, and a 1-foot-wide OHWM. The OHWM determination is based on scour and sediment deposits. No water was present at the time of the survey, and this tributary is considered an ephemeral head-water reach.

Segment D1-2 consists of a 1-foot-wide corrugated metal pipe (culvert) under the access road, connecting Segments D1-4 and D1-3 to D1-1.

D-3 consists of a 1-foot-wide roadside ditch excavated wholly in and draining only uplands; and does not appear to carry a relatively permanent flow of water. This roadside ditch is therefore considered to be excluded from the definition of waters of the U.S. (see separate section on Roadside Ditches, below).

The potentially jurisdictional segments of Tributary D include approximately 1,310 linear feet within the Study Area, for a total area of approximately 1,310 square feet (0.03 acre) of potential jurisdictional waters of the United States. No water was present at the time of the survey, and this tributary is considered an ephemeral head-water reach.

*Tributary E including Ditches and Culverts.* The segments of Tributary E are identified as E-1 through E-6 in Figure 3 and Table A. Tributary E is located in the northwestern watershed and drains to English Creek. All segments except the culvert are characterized by bed, bank, and an OHWM ranging between 1 and 3 feet in width. The OHWM determination is based on scour and sediment deposits. No water was present at the time of the survey, and this tributary is considered an ephemeral head-water reach.

Segments E-2a, E-2b, and E-4 consist of corrugated metal pipes (culverts) between 1.5 and 2 feet wide connecting various segments of Tributary E.

Segments E1-1 to E1-3 consist of ditches excavated wholly in and draining only uplands; and do not appear to carry a relatively permanent flow of water. They are therefore considered to be excluded from the definition of waters of the U.S. (ee separate section on Roadside Ditches, below).

All potentially jurisdictional segements of Tributary E include approximately 1,380 linear feet within the Study Area, for a total area of approximately 1,720 square feet (0.04 acre) of potential

jurisdictional waters of the United States. No water was present at the time of the survey, and this tributary is considered an ephemeral head-water reach.

*English Creek.* A 600-foot-long segment of English Creek (a USGS blue-line feature) runs along the northwestern boundary of the Study Area. This segment consists of an on average 10-foot-wide channel with a substantial OHWM, including destruction of riparian vegetation, water marks, erosion and sediment and debris depositions. Pools within the channel featured standing water at the time of the delineation survey.

The segment of English Creek includes approximately 6,000 square feet (0.14 acre) of potential jurisdictional waters of the United States.

*Tributary F.* Tributary F is identified as F-1 in Figure 3 and Table A. Tributary F is located in the northwestern watershed and drains directly to English Creek. Tributary F is characterized by bed, bank, and a 3-foot-wide OHWM. The OHWM determination is based on scour and sediment deposits. No water was present at the time of the survey, and this tributary is considered an ephemeral head-water reach.

Tributary F includes approximately 98 linear feet within the Study Area, for a total area of approximately 290 square feet (0.01 acre) of potential jurisdictional waters of the United States.

*Tributary G including Culvert.* The segments of Tributary G are identified as G-1 and G-2 in Figure 3 and Table A. Tributary G is located in the northwestern watershed and drains directly to English Creek. Segment G-1 is characterized by bed, bank, and a 3-foot-wide OHWM. The OHWM determination is based on scour and sediment deposits. No water was present at the time of the survey, and this tributary is considered an ephemeral head-water reach.

Segment G-2 consists of a 2-foot-wide corrugated metal pipe (culvert) under Cantelow Road, connecting to Segment G-1. No tributary is located upslope from Culvert G-1. However, the inlet to the culvert has an erosional scar, indicating at least ephemeral concentrated flow to this culvert.

The entire Tributary G includes approximately 130 linear feet within the Study Area, for a total area of approximately 350 square feet (0.01 acre) of potential jurisdictional waters of the United States. No water was present at the time of the survey, and this tributary is considered an ephemeral head-water reach.

*Tributary H including Culvert.* The segments of Tributary H are identified as H-1 through H-8 in Figure 3 and Table A. Tributary H is located in the northwestern watershed and drains to English Creek via Culvert Segment H-1, a 5-foot-wide corrugated metal pipe.

Segment H-2 consists of the spillway of Stock Pond H-3. Stock Pond H-3 impounds waters flowing through Tributary segments H-4 through H-8 and is discussed separately in a section covering potentially jurisdictional impoundments, below.

Segment H-4 consists of the 1,740-foot-long main channel of this deeply incised ephemeral stream and is characterized by bed, bank, and an on average 6-foot-wide OHWM. The OHWM determination is based on scour and sediment deposits.

All other segments are tributaries to the main stream channel H-4 and include eroding first order head-water reaches, with a few located on the bottom of substantially eroding gullies. All of these segments have an OHWM consisting of a scour line between 1 and 4 feet wide.

The entire Tributary H includes approximately 3,920 linear feet within the Study Area, for a total area of approximately 14,130 square feet (0.32 acre) of potential jurisdictional waters of the United States. No water was present at the time of the survey, and this tributary is considered an ephemeral head-water reach.

*Tributary I including Culvert.* The segments of Tributary I are identified as I-1 through I-5 in Figure 3 and Table A. Tributary I is located in the northwestern watershed and drains to English Creek via Culvert Segment I-1, a 3-foot-wide corrugated metal pipe.

Segment I1-1 consists of the spillway of Stock Pond I-2. Stock Pond I-2 impounds waters flowing through Tributary segments I-2 through I-5 and is discussed separately in a section covering potentially jurisdictional impoundments, below.

Segments I2 through I5 are characterized by bed, bank, and a 1-foot-wide OHWM. The OHWM determination is based on scour and sediment deposits.

The entire Tributary I includes approximately 2,010 linear feet within the Study Area, for a total area of approximately 2,070 square feet (0.05 acre) of potential jurisdictional waters of the United States. No water was present at the time of the survey, and this tributary is considered an ephemeral head-water reach.

*Tributary J.* The segments of Tributary J are identified as J-1 through J-7 in Figure 3 and Table A. Tributary J is located in the southeastern watershed, and both main arms of this tributary drain to Seasonal Swale Wetland SSW J-1, which drains to Gibson Canyon Creek. Additional seasonal swale wetlands connect segments of Tributary J. All seasonal swale wetlands are discussed separately in the Adjacent Waters section, below.

All reaches of Tributary J are characterized by bed, bank, and an OHWM ranging from 1 to 8 feet in width. The OHWM determination is based on scour and sediment deposits. No water was present at the time of the survey, and all segments are considered ephemeral.

The entire Tributary J includes approximately 2,270 linear feet within the Study Area, resulting in approximately 8,420 square feet (0.19 acre) of potential jurisdictional waters of the United States.

*Tributary L.* Tributary L is identified as L-1 in Figure 3 and Table A. Tributary L is located in the southeastern watershed and drains directly to Gibson Canyon Creek. Tributary L is characterized by bed, bank, and a 2-foot-wide OHWM. The OHWM determination is based on scour and sediment

deposits. No water was present at the time of the survey, and this tributary is considered an ephemeral head-water reach.

Tributary L includes approximately 670 linear feet within the Study Area, for a total area of approximately 1,336 square feet (0.03 acre) of potential jurisdictional waters of the United States.

*Tributary M including Culvert.* The segments of Tributary M are identified as M-1 through M-5 in Figure 3 and Table A. Tributary M is located in the southeastern watershed and drains to Gibson Canyon Creek. All segments except M-2 are characterized by bed, bank, and a 1- to 2-foot-wide OHWM. The OHWM determination is based on scour and sediment deposits. No water was present at the time of the survey, and this tributary is considered an ephemeral head-water reach.

Segment M-2 consists of a 1-foot-wide corrugated metal pipe (culvert) under a perimeter access road, connecting all upslope segments to Segment M-1.

A seasonal wetland has developed from a breached stock pond that previously has impounded flow from upstream segments of this tributary. This wetland is described in more detail as Seasonal Wetland SW M-4 in the Adjacent Waters section below.

The entire Tributary M includes approximately 950 linear feet within the Study Area, for a total area of approximately 1,570 square feet (0.04 acre) of potential jurisdictional waters of the United States.

*Tributary N including Culvert.* The segments of Tributary N are identified as N-1 through N-4 in Figure 3 and Table A. Tributary N is located in the southeastern watershed and drains to Gibson Canyon Creek. All segments are characterized by bed, bank, and a 1-foot-wide OHWM. The OHWM determination is based on scour and sediment deposits. No water was present at the time of the survey, and this tributary is considered an ephemeral head-water reach.

A potential seasonal swale wetland hydrologically connects segments N-4 and N2-1 to N-2. This wetland is described in more detail as Seasonal Wetland SSW N-3 in the Adjacent Waters section below.

The entire Tributary N includes approximately 750 linear feet within the Study Area, for a total area of approximately 750 square feet (0.02 acre) of potential jurisdictional waters of the United States.

*Tributary O.* The segments of Tributary O are identified as O-1a and O-1b in Figure 3 and Table A. Tributary O is located in the southeastern watershed and drains to an unnamed tributary of Gibson Canyon Creek. All reaches of Tributary O are characterized by bed, bank, and a 1- to 2-foot-wide OHWM. The OHWM determination is based on scour and sediment deposits. No water was present at the time of the survey, and all segments are considered ephemeral.

The entire Tributary O includes approximately 1,070 linear feet within the Study Area, resulting in approximately 2,040 square feet (0.05 acre) of potential jurisdictional waters of the United States.

## Potential Jurisdictional Adjacent Waters

Jurisdictional adjacent waters are bordering, contiguous, or neighboring to, waters of the United States. Further, waters that connect segments of, or are at the head of, a stream or river are adjacent to that stream or river. Adjacent waters include wetlands, ponds, lakes, oxbows, impoundments, and similar water features. Adjacent waters do not include waters in which established, normal farming, silviculture, and ranching activities under Section 404(f) of the CWA occur.

*Seasonal Swale Wetland SSW N-3.* Sample Point 1 was placed in a swale feature covered with senescent and grazed annual grass, predominantly consisting of Italian ryegrass and seaside barley (*Hordeum marinum*). Determining the exact proportion and extent of wetland plants in this feature would necessitate a follow-up survey in spring or early summer. No saturation was observed at the time of the survey, but potential prolonged saturation can be seen on aerial images taken during the wet season. The soil at the site is a very dark grayish brown sandy loam, with approximately five percent redox concentrations in dark red, which qualifies as hydric soil indicator Redox Dark Surface. Several gullies and hillslopes to three sides of this feature appear to be the source of extended seasonal saturation in this wetland. The wetland was mapped to the limit of its hydrophytic vegetation cover. The feature is approximately 38,850 square feet (0.89 acre) in size. The feature is located in the southeastern watershed and drains via Tributary N to Gibson Canyon Creek, which drains via a number of canals and other tributaries to the Sacramento River, a navigable water of the United States.

Sample Point 2 was placed at the edge of the hydrophytic vegetation of Seasonal Swale Wetland SSW N-3. The absence of dominant hydrophytic vegetation, hydric soil indicators, and wetland hydrology indicators led to the conclusion that no wetland is present at Sample Point 2.

*Seasonal Wetland SW M-4.* Sample Point 3 was placed in a former stock pond inserted in Tributary M. However, the berm of this stock pond is breached, and sediment has filled the basin, transforming it to a seasonal wetland. Vegetation within the former stock pond predominantly consisted of grazed narrowleaf cattails (*Typha angustifolia*) and brown-headed rush (*Juncus pheaocephalus*). Water marks, surface soil cracks, water stained leaves, and a biotic crust were indicators of wetland hydrology. No saturation was observed at the time of the survey. The soil at the site is a very dark grayish brown sandy loam, with approximately thirty percent redox concentrations in reddish yellow, which qualifies as hydric soil indicator Redox Dark Surface. The wetland was mapped to the limit of its hydrophytic vegetation cover. The feature is approximately 1,120 square feet (0.03 acre) in size. The feature is located in the southeastern watershed and drains via Tributary M to Gibson Canyon Creek, which drains via a number of canals and other tributaries to the Sacramento River, a navigable water of the United States.

Sample Point 4 was placed at the edge of the hydrophytic vegetation of Seasonal Wetland SSW N-3. The absence of both dominant hydrophytic vegetation, hydric soil indicators, and wetland hydrology indicators led to the conclusion that no wetland is present at areas represented by Sample Point 4.

*Seasonal Swale Wetland Complex SSW J-1.* Sample Points 5 and 11 were placed in a swale complex with several arms located on the eastern terrace, which is part of the southeastern watershed of the

Study Area. The swale complex conveys flows from the head-water reaches of Tributary J and additionally drains water from the watershed to the north of the Study Area. Water flowing through this swale/wetland complex traverses under Gibson Canyon Road via a culvert, ultimately draining to Gibson Canyon Creek, which drains via a number of canals and other tributaries to the Sacramento River, a navigable water of the United States.

At the time of the survey, this feature was covered with predominantly senescent and heavily grazed annual grasses and forbs, including Italian ryegrass, common lippia (*Phyla nodiflora*), and an at this time unidentifiable heavily grazed rush species (*Juncus* sp.). Determining the exact proportion and extent of wetland plants in this feature would necessitate a follow-up survey in spring or early summer. No saturation was observed at the time of the survey, but potential prolonged saturation can be seen on aerial images taken during the wet season. The soil at the site is a very dark grayish brown sandy loam, with between approximately ten and thirty percent redox concentrations in reddish yellow to dark red, which qualifies as hydric soil indicator Redox Dark Surface. The wetland was mapped to the limit of its hydrophytic vegetation cover. The entire feature is approximately 37,370 square foot (0.86) acre in size.

Sample Points 6 and 12 were placed at the edge of the hydrophytic vegetation of Seasonal Swale Wetland Complex SSW J-1. The absence of dominant hydrophytic vegetation, hydric soil indicators, and wetland hydrology indicators led to the conclusion that no wetland is present at areas represented by Sample Points 6 and 12.

*Seasonal Swale Wetland SSW K-1.* Seasonal Swale Wetland SSW K-1 is functionally an arm of Seasonal Swale Wetland Complex SSW J-1, with the confluence to the east of the Study Area. Conditions of this seasonal wetland swale are similar to the conditions of Seasonal Swale Wetland Complex SSW J-1 discussed above, with the difference that no tributaries are located directly upslope from this feature. This feature is 14,600 square feet (0.34 acre) in size and drains via a culvert under Gibson Canyon Road to Gibson Canyon Creek, which drains via a number of canals and other tributaries to the Sacramento River, a navigable water of the United States.

*Seasonal Swale Wetland Complex SSW J1.* Sample Point 7 was placed in a swale complex located upslope of the eastern terrace, which is part of the southeastern watershed of the Study Area. The swale complex conveys flows from the head-water reaches of the north fork of Tributary J. Water flowing through this swale wetland complex continues downslope via Tributary segment J1-1 and Seasonal Wetland Complex SSW J-1, ultimately draining to Gibson Canyon Creek, which drains via a number of canals and other tributaries to the Sacramento River, a navigable water of the United States.

At the time of the survey, this feature was covered with predominantly senescent and heavily grazed Italian ryegrass, but other facultative wetlands species occurred, including rush and seaside barley. No saturation was observed at the time of the survey, but potential prolonged saturation can be seen on aerial images taken during the wet season. The soil at the site is a very dark grayish brown sandy loam, with between approximately ten and thirty percent redox concentrations in reddish yellow, which qualifies as hydric soil indicator Redox Dark Surface. The wetland was mapped to the limit of its hydrophytic vegetation cover. The entire complex (consisting of two wetlands connected by a short channel) is approximately 5,080 square feet (0.12 acre) in size.

Sample Point 8 was placed at the edge of the hydrophytic vegetation of Seasonal Swale Wetland Complex SSW J1. The absence of dominant hydrophytic vegetation, hydric soil indicators, and wetland hydrology indicators led to the conclusion that no wetland is present at areas represented by Sample Point 8.

*Seasonal Swale Wetland Complex SSW J2-1, J-3, and J-5.* Sample Point 9 was placed in a swale complex located upslope of the eastern terrace, which is part of the southeastern watershed of the Study Area. The swale complex conveys flows from the head-water reaches of the south fork of Tributary J. Water flowing through this swale wetland complex continues downslope via Tributary segment J-2 and Seasonal Wetland Complex SSW J-1, ultimately draining to Gibson Canyon Creek, which drains via a number of canals and other tributaries to the Sacramento River, a navigable water of the United States.

At the time of the survey, this feature was covered with predominantly senescent and heavily grazed Italian ryegrass, but other facultative wetlands species occurred, including rush and seaside barley. No saturation was observed at the time of the survey, but potential prolonged saturation can be seen on aerial images taken during the wet season. The soil at the site is a very dark grayish brown sandy loam, with approximately twenty-five percent redox concentrations in strong brown, which qualifies as hydric soil indicator Redox Dark Surface. The wetland was mapped to the limit of its hydrophytic vegetation cover. The entire complex (consisting of two wetland swale arms connected by a short channel) is approximately 16,410 square feet (0.38 acre) in size.

Sample Point 10 was placed at the edge of the hydrophytic vegetation of Seasonal Swale Wetland Complex SSW J2-1. The absence of dominant hydrophytic vegetation, hydric soil indicators, and wetland hydrology indicators led to the conclusion that no wetland is present at areas represented by Sample Point 10.

### Potential Jurisdictional Impoundments

All impoundments of waters otherwise identified as waters of the United States are jurisdictional by rule in all cases without need to demonstrate a case-specific significant nexus.

*Stock Pond I-2.* Stock Pond I-2 consists of an approximately 1.57-acre perennial stock pond with a berm on its northern side. Stock Pond 1 impounds waters flowing through Tributary I. At the time of the delineation, vegetation was generally lacking, potentially due to heavy use by cattle. This stock pond may include a seasonal wetland component in the transition zone between open water habitat and incoming channels. Stock Pond I-2 was delineated following the OHWM where present and including a potential seasonal wetland component. A spillway on the western side of the berm appears to convey some concentrated flow (mapped as Tributary I1-1); however, no channelization was visible between the spillway and Culvert I-1 below Cantelow Road draining to English Creek.

*Stock Pond H-3.* Stock Pond H-3 consists of an approximately 0.59-acre intermittently ponding stock pond with a berm on its northern side. Analysis of aerial imagery shows that water can pond in this feature until August depending on annual rainfall rates. Stock Pond H-3 impounds waters flowing through Tributary H-4, and also appears to have seasonal wetland characteristics. At the time of the delineation, no water was present, and parts of the stock pond basin were covered with both

wetland and upland species, including spiny cocklebur (*Xanthium spinosum*), turkey-mullein (*Croton setiger*), Bermuda grass (*Cynodon dactylon*), swamp grass (*Crypsis schoenoides*), saltgrass (*Distichlis spicata*), and Italian ryegrass.

A spillway on the western side of the berm (mapped as Tributary section H-2) conveys concentrated flow to Culvert I-1 under Cantelow Road draining to English Creek to the north.

## Table A: Summary of Potentially Jurisdictional Waters of the United States

| | Length (linear feet rounded to nearest 10) | Width (linear feet) | Area (square feet rounded to nearest 10) | Area (acre) |
|---|---|---|---|---|
| **Potential Jurisdictional Tributaries (incl. Potentially Jurisdictional Ditches and Culverts)** | | | | |
| Tributary Segment A-1 | 110 | 1 | 110 | 0.00 |
| Tributary Segment A1-1 | 90 | 1 | 90 | 0.00 |
| Tributary Segment A-2 | 200 | 1 | 200 | 0.00 |
| Tributary Segment B-1 | 100 | 1 | 100 | 0.00 |
| Tributary Segment (Culvert) B-2 | 70 | 1 | 70 | 0.00 |
| Tributary Segment B-3 | 60 | 1 | 60 | 0.00 |
| Tributary Segment C-1 | 220 | 1 | 220 | 0.01 |
| Tributary Segment D-1 | 120 | 1 | 120 | 0.00 |
| Tributary Segment D1-1 | 170 | 1 | 170 | 0.00 |
| Tributary Segment (Culvert) D1-2 | 20 | 1 | 20 | 0.00 |
| Tributary Segment D1-3 | 270 | 1 | 270 | 0.01 |
| Tributary Segment D1-4 | 460 | 1 | 460 | 0.01 |
| Tributary Segment D-2 | 270 | 1 | 270 | 0.01 |
| Tributary Segment E-1 | 240 | 1 | 240 | 0.01 |
| Tributary Segment E2-1 | 60 | 1 | 60 | 0.00 |
| Tributary Segment (Culvert) E-2a | 30 | 2 | 50 | 0.00 |
| Tributary Segment (Culvert) E-2b | 50 | 1.5 | 70 | 0.00 |
| Tributary Segment E-3 | 540 | 1 | 540 | 0.01 |
| Tributary Segment (Culvert) E-4 | 30 | 2 | 50 | 0.00 |
| Tributary Segment E-5 | 280 | 2 | 560 | 0.01 |
| Tributary Segment E-6 | 150 | 1 | 150 | 0.00 |
| English Creek | 600 | 10 | 5,960 | 0.14 |
| Tributary Segment F-1 | 100 | 3 | 290 | 0.01 |
| Tributary Segment G-1 | 100 | 3 | 290 | 0.01 |
| Tributary Segment (Culvert) G-2 | 30 | 2 | 60 | 0.00 |
| Tributary Segment (Culvert) H-1 | 10 | 2 | 10 | 0.00 |
| Tributary Segment H1.1-1 | 80 | 1 | 80 | 0.00 |
| Tributary Segment H1-1 | 150 | 1 | 150 | 0.00 |
| Tributary Segment H-2 | 220 | 1 | 220 | 0.01 |
| Tributary Segment H2-1 | 110 | 3 | 320 | 0.01 |
| Tributary Segment H2-2 | 90 | 1 | 90 | 0.00 |
| Tributary Segment H3.1-1 | 110 | 2 | 220 | 0.01 |
| Tributary Segment H3-1 | 220 | 1 | 220 | 0.00 |
| Tributary Segment H3-2 | 390 | 1 | 390 | 0.01 |
| Tributary Segment H-4 | 1,740 | 6 | 10,430 | 0.24 |
| Tributary Segment H4.1-1 | 60 | 1 | 60 | 0.00 |
| Tributary Segment H4-1 | 50 | 1 | 50 | 0.00 |
| Tributary Segment H-5 | 90 | 4 | 350 | 0.01 |

| | Length (linear feet rounded to nearest 10) | Width (linear feet) | Area (square feet rounded to nearest 10) | Area (acre) |
|---|---|---|---|---|
| Tributary Segment H5-1 | 20 | 1 | 20 | 0.00 |
| Tributary Segment H-6 | 310 | 4 | 1,240 | 0.03 |
| Tributary Segment H6-1 | 70 | 1 | 70 | 0.00 |
| Tributary Segment H-7 | 100 | 1 | 100 | 0.00 |
| Tributary Segment H-8 | 110 | 1 | 110 | 0.00 |
| Tributary Segment (Culvert) I-1 | 30 | 3 | 90 | 0.00 |
| Tributary Segment I1-1 | 30 | 1 | 30 | 0.00 |
| Tributary Segment I2.1-1 | 200 | 1 | 200 | 0.00 |
| Tributary Segment I2-1 | 430 | 1 | 430 | 0.01 |
| Tributary Segment I-3 | 470 | 1 | 470 | 0.01 |
| Tributary Segment I3-1 | 70 | 1 | 70 | 0.00 |
| Tributary Segment I4-1 | 330 | 1 | 330 | 0.01 |
| Tributary Segment i5.1-1 | 50 | 1 | 50 | 0.00 |
| Tributary Segment I5-1 | 90 | 1 | 90 | 0.00 |
| Tributary Segment I5-2 | 70 | 1 | 70 | 0.00 |
| Tributary Segment I5-3 | 250 | 1 | 250 | 0.01 |
| Tributary Segment J1.1-1 | 120 | 1 | 120 | 0.00 |
| Tributary Segment J1.2.1-1 | 50 | 1 | 50 | 0.00 |
| Tributary Segment J1.2-2 | 160 | 1 | 160 | 0.00 |
| Tributary Segment J1-1 | 520 | 4 | 2,080 | 0.05 |
| Tributary Segment J1-3 | 70 | 1 | 70 | 0.00 |
| Tributary Segment J1-6 | 150 | 1 | 150 | 0.00 |
| Tributary Segment J-2 | 490 | 8 | 3,920 | 0.09 |
| Tributary Segment J2-2 | 90 | 2 | 180 | 0.00 |
| Tributary Segment J3-1 | 210 | 1 | 210 | 0.00 |
| Tributary Segment J-4 | 50 | 3 | 160 | 0.00 |
| Tributary Segment J-6 | 220 | 3 | 670 | 0.02 |
| Tributary Segment J-7 | 260 | 3 | 780 | 0.02 |
| Tributary Segment L-1 | 670 | 2 | 1,340 | 0.03 |
| Tributary Segment M-1 | 90 | 2 | 180 | 0.00 |
| Tributary Segment M1-1 | 330 | 1 | 330 | 0.01 |
| Tributary Segment (Culvert) M-2 | 10 | 1 | 10 | 0.00 |
| Tributary Segment M-3 | 50 | 2 | 90 | 0.00 |
| Tributary Segment M-5 | 480 | 2 | 960 | 0.02 |
| Tributary Segment N-1 | 160 | 1 | 160 | 0.00 |
| Tributary Segment N-2 | 160 | 1 | 160 | 0.00 |
| Tributary Segment N2-1 | 90 | 1 | 90 | 0.00 |
| Tributary Segment N2-2 | 50 | 1 | 50 | 0.00 |
| Tributary Segment N-4 | 290 | 1 | 290 | 0.01 |
| Tributary Segment O-1a | 970 | 2 | 1,940 | 0.04 |
| Tributary Segment O-1b | 100 | 1 | 100 | 0.00 |
| **Potential Jurisdictional Adjacent Waters** | | | | |
| Seasonal Swale Wetland SSW N-3 | - | - | 38,850 | 0.89 |
| Seasonal Wetland SW M-4 | - | - | 1,120 | 0.03 |
| Seasonal Swale Wetland Complex SSW J-1 | - | - | 37,370 | 0.86 |
| Seasonal Swale Wetland SSW K-1 | - | - | 14,600 | 0.34 |
| Seasonal Swale Wetland Complex SSW J1 | - | - | 5,080 | 0.12 |
| Seasonal Swale Wetland Complex SSW J2-1, J3, and J-5 | - | - | 16,410 | 0.38 |

| | Length (linear feet rounded to nearest 10) | Width (linear feet) | Area (square feet rounded to nearest 10) | Area (acre) |
|---|---|---|---|---|
| **Potential Jurisdictional Impoundments** | | | | |
| Stock Pond I-2 | - | - | 68,390 | 1.57 |
| Stock Pond H-3 | - | - | 25,693 | 0.59 |
| **SUMMARY** | | | | |
| Tributaries, Ditches, Culverts | 16,160 | - | 4,940 | 0.94 |
| Adjacent Waters | - | - | 113,430 | 2.60 |
| Impoundments | - | - | 94,083 | 2.16 |
| **All Potential Jurisdictional Features** | | | **248,453** | **5.70** |

## OTHER FEATURES POTENTIALLY EXCLUDED FROM CORPS JURISDICTION

### Features Caused by Leaking or Overflow of the Ranch Water System

*Overflow Feature 1.* Overflow Feature 1 is located at the southeastern corner of the Study Area near Tributaries N-1 and N-2. A PVC pipe appears to continuously deliver water to a cattle trough at this location. Due to prolonged leaking and/or overflow from the trough, 4,380 square feet (0.1 acre) of prolonged saturation have developed. Plant species growing in this wet spot include spiny cocklebur, rabbit's-foot grass, swamp grass, Bermuda grass, Italian thistle, and Italian ryegrass. It is anticipated that the potential wetland characteristics of this area will disappear once leaking or overflow from this ranch water infrastructure is stopped. Therefore, we believe this area may not qualify as a water of the United States as defined in the Clean Water Rule.

*Leak Feature 1.* Leak Feature 1 is located upslope from Seasonal Swale Wetland Complex J-1 (SSW J-1). A PVC pipe delivers water to a cattle trough to the east of this feature. Due to prolonged leaking from the pipe, 2,060 square feet (0.05 acre) of prolonged saturation and erosion have developed. It is anticipated that the potential wetland characteristics of this area will disappear once leaking is stopped. Therefore, we believe this area may not qualify as a water of the United States as defined in the Clean Water Rule.

### Erosional Features

The Study Area includes dozens of erosional features disconnected from head-water tributaries. These features can be identified from aerial imagery and are predominantly located on steeper slopes or between steep slopes. These features include a range of sizes from small slides to large gullies. No hydrophytic plant species were observed in these features. Where a hydrological connection to a first order tributary has developed, and bed, bank and OHWM have developed, these gullies/tributaries were included as aquatic resources (Table A). All other purely erosional features are assumed not to qualify as waters of the United States under the Clean Water Rule.

### Ditches (including Roadside Ditches and associated Culverts)

Several excavated ditches and one culvert are associated with the western access road (Features E1-1 to E1-3, and D3; Figure 3). The ditches may convey ephemeral flow, and some sections are lined

with gravel, however no clear OHWM was observed. No wetland plants were observed growing in the ditch. The ditches are not located in a tributary or replace a tributary.

These ditches are excavated wholly in and drain only uplands; do not appear to carry a relatively permanent flow of water, and are therefore considered excluded from the definition of waters of the U.S. In extension, culvert E1-2, which is associated with the roadside ditch, is therefore also considered to be excluded from the definition of waters of the U.S.

## REGIONAL WATER QUALITY CONTROL BOARD JURISDICTION

RWQCB jurisdiction (Waters of the State) for the potential jurisdictional features identified on all Study Areas for this Project is expected to be identical to Corps jurisdiction.

# CONCLUSIONS

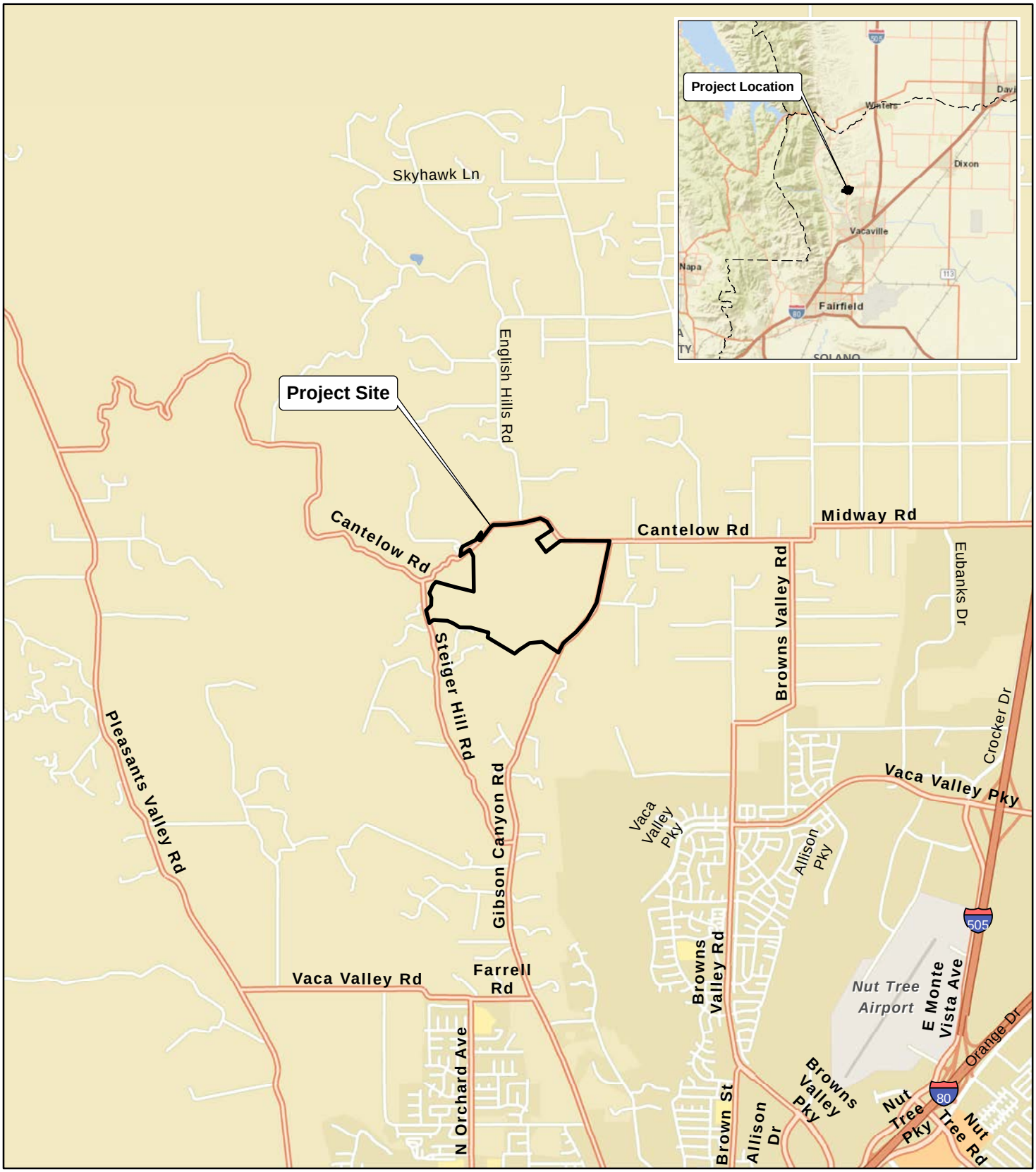
Potential Clean Water Act Section 404 waters of the United States identified in all Study Areas include 0.94 acre of tributaries, 2.16 acres of impoundments, and 2.60 acres of Adjacent Waters of the United States for a total potentially jurisdictional area of 5.70 acres. Potential jurisdictional features, Study Area boundaries, and sample point locations are mapped on Figure 3.

No traditional navigable waters, interstate waters, territorial seas, or special-case waters of the United States were observed within the Study Area.

The findings and conclusions presented in this report, including the location and extent of waters subject to regulatory jurisdiction, represent the professional opinion of LSA. These findings and conclusions should be considered preliminary until verified by the Corps.

# APPENDIX A

# FIGURES




LSA

FIGURE 1

N

0 2000 4000

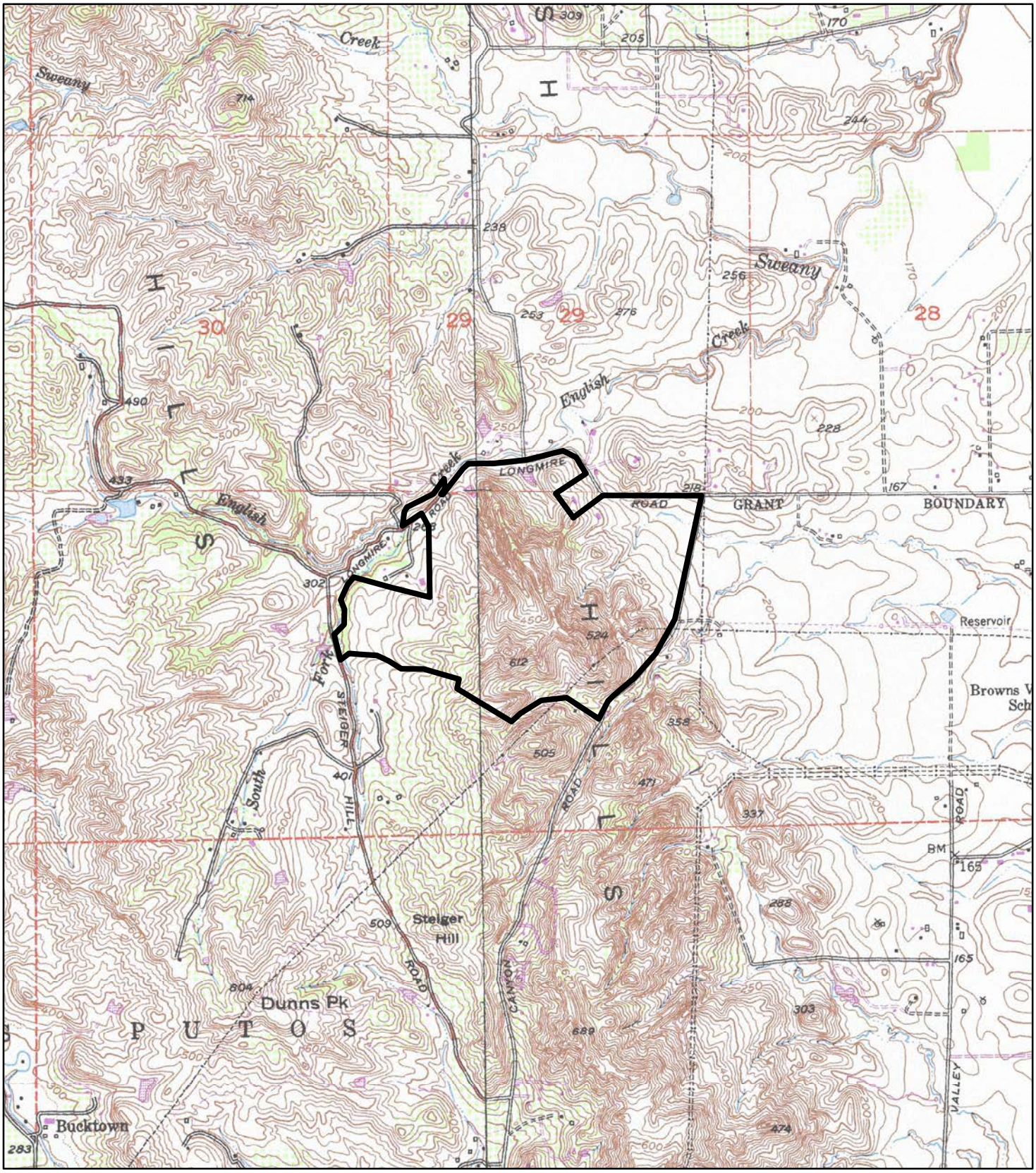
FEET

*Land of Morgan*
*Solano County, California*

Regional Location

SOURCE: ESRI StreetMap North America; Esri World Street Map (c) 2018.

I:\WIM1801\GIS\Maps\Figure 1_Regional Location.mxd (10/10/2018)




LSA

LEGEND

Project Site

FIGURE 2

N

0 1000 2000

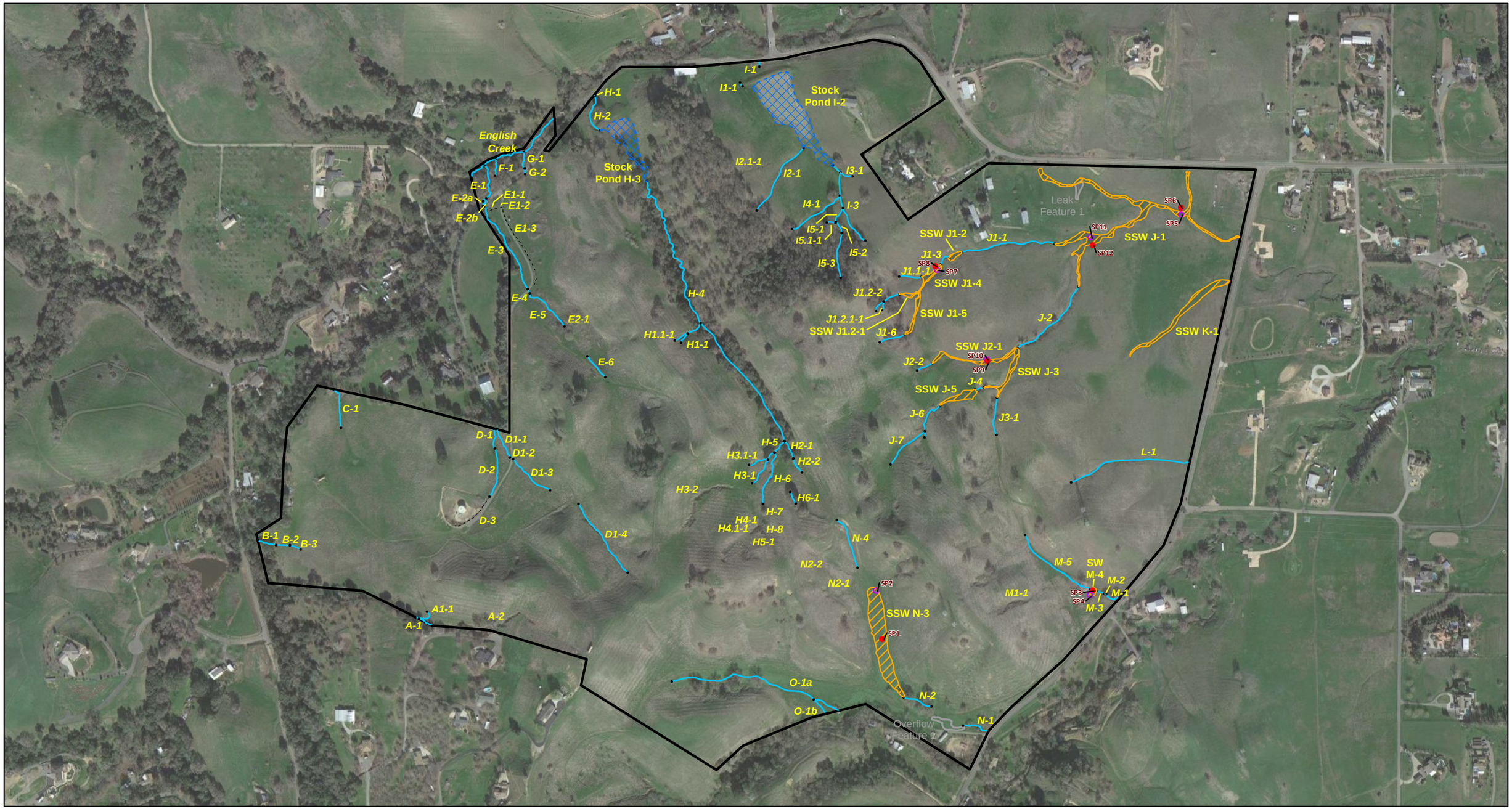
FEET

*Land of Morgan*
*Solano County, California*

Site Location

SOURCE: 7.5-minute Quads: *Mt, Vaca, Calif.* (1968) and *Allendale, Calif.* (1973)

I:\WIM1801\GIS\Maps\Figure 2_Site Location.mxd (10/10/2018)




LSA

LEGEND

- Delineation Study Area
- Wetland Sample Point
- Upland Sample Point
- Potential Non-Jurisdictional Features

Potential Waters of the United States

Adjacent Waters

- Seasonal Wetland or Seasonal Swale Wetland

Impoundments

- Stock Pond

Tributaries

- Tributary

- Roadside Ditch

0 250 500
FEET

SOURCE: Google Maps (c)2018; LSA (2018).

I:\WIM1801\GIS\Maps\Delineation\Figure 3_Potential Waters of the US.mxd (1/16/2019)

FIGURE 3

*Land of Morgan*
*Solano County, California*

Potential Waters of the United States

# APPENDIX B

# FIELD DATA SHEETS

## WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: LAND OF MORGAN City/County: VACAVILLE, SOLANO CO Sampling Date: 9/12/18

Applicant/Owner: W. MORGAN State: _____ Sampling Point: (1)

Investigator(s): B. WARZECHA Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): 0-5

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X No _____ |
| Hydric Soil Present? | Yes X No _____ | |
| Wetland Hydrology Present? | Yes _____ No _____ | |

Remarks: ideally to be re-visited in spring


### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | 0 = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 = Total Cover | | |
| **Herb Stratum** (Plot size: 1 m²) | | | |
| 1. FESTUCA PERENNIS | 50 | Y | FAC |
| 2. HORDEUM MARINUM | 50 | Y | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 100 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| | 0 = Total Cover | | |

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

**Dominance Test worksheet:**

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

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

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

**Prevalence Index worksheet:**

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

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

**Hydrophytic Vegetation Present?** Yes X No _____

Remarks: Grass dried up. hardly any seedheads, grazed / exact % cover not measurable at this time

## SOIL

Sampling Point: 1

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 4-12 | 10 YR 3/2 | 95 | 2.5YR 3/6 | 5 | C | PL | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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)
- X Redox Dark Surface (F6) (b)
- ___ 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 X No ___

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

**Wetland Hydrology Present?** Yes X No ___

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: LAND OF MORGAN City/County: VACAVILLE, SOLANO CO Sampling Date: 9/12/18

Applicant/Owner: W. MORGAN State: _____ Sampling Point: (2)

Investigator(s): B. WARZECHA Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): 5

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X | **Is the Sampled Area within a Wetland?** Yes _____ No X |
| Hydric Soil Present? | Yes _____ No X | |
| Wetland Hydrology Present? | Yes _____ No X | |

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: 1 m²) | | | |
| 1. AVENA SP | 50 | Y | UPL |
| 2. TRITICUM AESTIVUM | 50 | Y | N/A |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | _____ = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| | _____ = Total Cover | | |

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

**Dominance Test worksheet:**

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

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

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

**Prevalence Index worksheet:**

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

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

**Hydrophytic Vegetation Present?** Yes _____ No X

Remarks:

% - COVER DIFFICULT TO DETERMINE AT THIS TIME

## SOIL

Sampling Point: SP-2

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 12 | 10 YR 4/3 | 100 | | | | | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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 X

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes _____ No X

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: LAND OF MORGAN City/County: VACAVILLE, SOLANO CO Sampling Date: 9/12/18

Applicant/Owner: W. MORGAN State: CA Sampling Point: (3)

Investigator(s): B. WARZECHA Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): 0-3

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X No _____ | **Is the Sampled Area within a Wetland?** Yes X No _____ |
| Hydric Soil Present? | Yes X No _____ | |
| Wetland Hydrology Present? | Yes X No _____ | |

Remarks:


SP located in center of seasonal stockpond, breached berm. Dry.

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | = Total Cover | | |
| **Herb Stratum** (Plot size: 1 m²) | | | |
| 1. TYPHA SP. | 30 | Y | OBL |
| 2. FESTUCA PERENNIS | 10 | N | FAC |
| 3. JUNCUS PHAEOCEPHALUS | 30 | Y | FAC |
| 4. CYNODON DACTYLUS | 10 | N | FACU |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 80 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| | = Total Cover | | |

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust _____

**Dominance Test worksheet:**

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

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

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

**Prevalence Index worksheet:**

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

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

**Hydrophytic Vegetation Present?** Yes X No _____

Remarks:

## SOIL

Sampling Point: 3

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 12 | 10YR 3/2 | 70 | 7.5 YR 6/6 | 30 | C | M,PL | 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 X No _____

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- X Surface Soil Cracks (B6)
- ? Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- X 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 X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes X No _____

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Land of Morgan City/County: Vacaville, Solano Co Sampling Date: 9/12/2018

Applicant/Owner: William Morgan State: CA Sampling Point: 4

Investigator(s): B. Warzecha Section, Township, Range: T7N R1W

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): 0-5

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

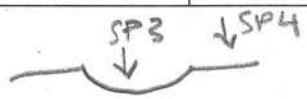
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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 X | **Is the Sampled Area within a Wetland?** Yes _____ No X |
| Hydric Soil Present? | Yes _____ No X | |
| Wetland Hydrology Present? | Yes _____ No X | |

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: 1 m²) | | | |
| 1. CARDUUS PYCNOCEPHALUS | 30 | X | N/A |
| 2. BROMUS HORDEACEUS | 40 | Y | FACU |
| 3. LACTUCA SERRIOLA | 5 | N | FACU |
| 4. HORDEUM MURINUM | 10 | N | FACU |
| 5. AVENA SP | 15 | N | UPL |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 100 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| | _____ = Total Cover | | |

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

**Dominance Test worksheet:**

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

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

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

**Prevalence Index worksheet:**

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

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

**Hydrophytic Vegetation Present?** Yes _____ No X

Remarks:

Plants senescent

## SOIL

Sampling Point: (4)

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

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 12 | 10YR 4/2 | 100 | | | | | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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 X

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

**Wetland Hydrology Present?** Yes _____ No X

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

Remarks:

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Land of Morgan City/County: Vacaville, Solano Co Sampling Date: 9/12/2018

Applicant/Owner: William Morgan State: CA Sampling Point: (5)

Investigator(s): B. Warzecha Section, Township, Range: T7N R1W

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): 1-3

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X No _____ | **Is the Sampled Area within a Wetland?** Yes X No _____ |
| Hydric Soil Present? | Yes X No _____ | |
| Wetland Hydrology Present? | Yes X No _____ | |

Remarks: SP-5 ↓ swale wetland patch

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | _____ = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | _____ = Total Cover | | |
| **Herb Stratum** (Plot size: 1 m²) | | | |
| 1. JUNCUS SP. | 45 | Y | FACW |
| 2. FESTUCA PERENNIS | 30 | Y | FAC |
| 3. CYNODON DACTYLON | 10 | N | FACU |
| 4. XANTHIUM SPINOSUM | 5 | N | FACU |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 90 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| | _____ = Total Cover | | |

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust _____

**Dominance Test worksheet:**

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

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

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

**Prevalence Index worksheet:**

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

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

**Hydrophytic Vegetation Present?** Yes X No _____

Remarks:

## SOIL

Sampling Point: 5

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 12 | 10YR 3/2 | 90 | 7.5YR 6/6 | 10 | C | PL | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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)
- X 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 X No _____

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- X 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 X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes X No _____

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

Remarks:

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Land of Morgan City/County: Vacaville, Solano Co Sampling Date: 9/12/2018

Applicant/Owner: William Morgan State: CA Sampling Point: 6

Investigator(s): B. Warzecha Section, Township, Range: T7N R1W

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): 3-5

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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.

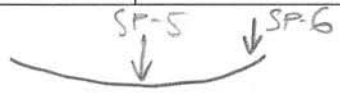
Hydrophytic Vegetation Present? Yes _____ No X

Hydric Soil Present? Yes _____ No X

Wetland Hydrology Present? Yes _____ No X

**Is the Sampled Area within a Wetland?** Yes _____ No X

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: 1m²) | | | |
| 1. AVENA SP | 45 | Y | UPL |
| 2. BROMUS HORDEACEUS | 30 | Y | FACU |
| 3. CARDUUS PYCNOCEPHALUS | 10 | N | N/A |
| 4. HORDEUM MURINUM | 10 | N | FACU |
| 5. LACTUCA SERRIOLA | 5 | N | FACU |
| 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 _____

**Dominance Test worksheet:**

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

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

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

**Prevalence Index worksheet:**

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

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

**Hydrophytic Vegetation Present?** Yes _____ No X

Remarks:

## SOIL

Sampling Point: 6

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

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Redox Features Type[1] | Redox Features Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1-12 | 10YR 2/3 | 100 | | | | | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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 X

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

**Wetland Hydrology Present?** Yes _____ No X

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Land of Morgan City/County: Vacaville, Solano Co Sampling Date: 9/12/2019

Applicant/Owner: William Morgan State: CA Sampling Point: 7

Investigator(s): B. Warzecha Section, Township, Range: T7N R1W

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): 0-5

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X No _____ | **Is the Sampled Area within a Wetland?** Yes X No _____ |
| Hydric Soil Present? | Yes X No _____ | |
| Wetland Hydrology Present? | Yes X 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: 1 $m^2$) | | | |
| 1. FESTUCA PERENNIS | 80 | Y | FAC |
| 2. JUNCUS SP. | 5 | N | FACW |
| 3. CARDUUS PYCNOCEPHA | 5 | N | N/A |
| 4. BROMUS HORDEACEUS | 5 | N | FACU |
| 5. CENTAUREA SOLSTITIALIS | 1 | N | N/A |
| 6. HORDEUM MARINUM | 4 | N | FACW |
| 7. | | | |
| 8. | | | |
| | 100 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| | _____ = Total Cover | | |

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

**Dominance Test worksheet:**

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

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

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

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: | |
|---|---|---|
| OBL species | x 1 = | |
| FACW species | x 2 = | |
| FAC species | x 3 = | |
| FACU species | 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 X No _____

Remarks:

Plants senescent, grazed.

## SOIL

Sampling Point: 7

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

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 10 | 10YR 2/3 | 70 | 7.5YR 5/6 | 30 | C | M | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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)
- X 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 X No _____

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- X Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X 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 X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes X No _____

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Land of Morgan City/County: Vacaville, Solano Co Sampling Date: 9/19/2018

Applicant/Owner: William Morgan State: CA Sampling Point: 8

Investigator(s): B. Warzecha Section, Township, Range: T7N R1W

Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): _____ Slope (%): 30

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X | **Is the Sampled Area within a Wetland?** Yes _____ No X |
| Hydric Soil Present? | Yes _____ No X | |
| Wetland Hydrology Present? | Yes _____ No X | |

Remarks:

### 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: 1m²) | | | |
| 1. TAENIATHERUM CAPUT-MEDUSAE | 60 | Y | N/A |
| 2. BROMUS HORDEACEUS | 10 | N | FACU |
| 3. CENTAUREA SOLSTITIALIS | 20 | N | N/A |
| 4. AVENA SP | 10 | N | UPL |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 100 = Total Cover | | |
| Woody Vine Stratum (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| | _____ = Total Cover | | |

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

**Dominance Test worksheet:**

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

Total Number of Dominant Species Across All Strata: 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 X

Remarks:

## SOIL

Sampling Point: 8

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

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 12 | 10YR 2/3 | 100 | — | — | | | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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 X

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes _____ No X

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Land of Morgan City/County: Vacaville, Solano Co Sampling Date: 9/19/2018

Applicant/Owner: William Morgan State: CA Sampling Point: 9

Investigator(s): B. Warzecha Section, Township, Range: T7N R1W

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): 0-5

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X No _____ | **Is the Sampled Area within a Wetland?** Yes X No _____ |
| Hydric Soil Present? | Yes X No _____ | |
| Wetland Hydrology Present? | Yes X No _____ | |

Remarks:

Swale wetland connected through tribs

### 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: 1m²) | | | |
| 1. FESTUCA PERENNIS | 90 | Y | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 90 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| | _____ = Total Cover | | |

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

**Dominance Test worksheet:**

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

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

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

**Prevalence Index worksheet:**

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

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

**Hydrophytic Vegetation Present?** Yes X No _____

Remarks:

all plants senescent, grazed

## SOIL

Sampling Point: 9

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 12 | 10YR 2/3 | 75 | 7.5YR 6/5 | 25 | C | M | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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)
- X 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 X No _____

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X 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 X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes X No _____

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Arid West Region

19

Project/Site: Land of Morgan City/County: Vacaville, Solano Co Sampling Date: 9/12/2018

Applicant/Owner: William Morgan State: CA Sampling Point: 10

Investigator(s): B. Warzecha Section, Township, Range: T7N R1W

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): 0-5

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X | **Is the Sampled Area within a Wetland?** Yes _____ No X |
| Hydric Soil Present? | Yes _____ No X | |
| Wetland Hydrology Present? | Yes _____ No X | |

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: 1 m²) | | | |
| 1. BROMUS HORDEACEUS | 70 | Y | FACU |
| 2. CENTAUREA SOLSTIT. | 20 | N | N/A |
| 3. TAENIATHERUM CAPUT-M | 10 | N | N/A |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 100 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| | _____ = Total Cover | | |

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

**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 X

Remarks:

## SOIL

Sampling Point: 10

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

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 12 | 10YR 2/3 | 100 | — | | | | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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 X

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes _____ No X

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

Remarks:

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Land of Morgan City/County: Vacaville, Solano Co Sampling Date: 9/19/2018

Applicant/Owner: William Morgan State: CA Sampling Point: 11

Investigator(s): B. Warzecha Section, Township, Range: T7N R1W

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): 0-5

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X No _____ | **Is the Sampled Area within a Wetland?** Yes X No _____ |
| Hydric Soil Present? | Yes X No _____ | |
| Wetland Hydrology Present? | Yes X 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: 1m²) | | | |
| 1. FESTUCA PERENNIS | 80 | Y | FAC |
| 2. PHYLA NODIFLORA | 10 | N | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 90 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| | _____ = Total Cover | | |

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust _____

**Dominance Test worksheet:**

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

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

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

**Prevalence Index worksheet:**

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

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

**Hydrophytic Vegetation Present?** Yes X No _____

Remarks:

## SOIL

Sampling Point: 11

**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 |
|---|---|---|---|---|---|---|---|---|
| 4+0 | 10YR 2/3 | 94 | 7.5YR 6/6 | 6 | C | PL | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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)
- X 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 X No _____

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X 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 X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes X No _____

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Land of Morgan City/County: Vacaville, Solano Co Sampling Date: 9/12/2018 (19)

Applicant/Owner: William Morgan State: CA Sampling Point: 12

Investigator(s): B. Warzecha Section, Township, Range: T7N R1W

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): 0-5

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X | **Is the Sampled Area within a Wetland?** Yes _____ No X |
| Hydric Soil Present? | Yes _____ | No X | |
| Wetland Hydrology Present? | Yes _____ | No X | |

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: 1 m²) | | | |
| 1. BROMUS HORDEACEUS | 75 | Y | FACU |
| 2. AVENA SP | 10 | N | UPL |
| 3. CENTAUREA SOLSTITIALIS | 5 | N | N/A |
| 4. CARDUUS PYCNOCEPHALUS | 10 | N | N/A |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 100 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| | _____ = Total Cover | | |

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

**Dominance Test worksheet:**

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

Total Number of Dominant Species Across All Strata: 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 X

Remarks:

## SOIL

Sampling Point: 12

**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 % | Redox Features Type[1] | Redox Features Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 10 | 10YR 2/3 | 100 | — | | | | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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 X

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes _____ No X

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

Remarks: