BIOLOGICAL RESOURCES ASSESSMENT

LANDS OF MORGAN SOLANO COUNTY, CALIFORNIA





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Submitted to:

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Project No. WIM1801



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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 specialstatus 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 Quadrangle¹.
- 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

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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*. 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*.

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

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.

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.

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
DIE	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 Fritillaria pluriflora	Not likely to occur			1B.2	
Baker's navarretia Navarretia leucocephala ssp. bakeri	Not likely to occur			1B.1	
Bearded popcornflower Plagiobothrys hystriculus	Not likely to occur			1B.1	
Brewer's western flax Hesperolinon breweri	Not likely to occur			1B.2	
Dwarf downingia Downingia pusilla	Not likely to occur			2B.2	

⁶ E= Endangered, T=Threatened

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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

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

Tributary Segment H-2 220 1 220 Tributary Segment H2-1 110 3 320 Tributary Segment H3.1-1 110 2 220 Tributary Segment H3-1 110 2 220 Tributary Segment H3-2 390 1 390 Tributary Segment H4-1 1,740 6 10,430 Tributary Segment H4-1 50 1 50 Tributary Segment H4-1 50 1 50 Tributary Segment H5-1 90 4 350 Tributary Segment H5-1 20 1 20 Tributary Segment H6-1 70 1 70 Tributary Segment H6-1 70 1 70 Tributary Segment H8-8 110 1 100 Tributary Segment (Culvert) I-1 30 3 90 Tributary Segment (Culvert) I-1 30 1 30 Tributary Segment (Culvert) I-1 30 1 30 Tributary Segment (Culvert) I-1 30 1 <td< th=""><th>Area (acre)</th></td<>	Area (acre)
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	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.
 - Wildlife Habitat: A Watershed Preservation and Management Zone should be adopted for higher elevations.
- 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.

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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.

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FIGURES

Figure 1: Location Map Figure 2: Topography Figure 3: Soil Map

Figure 4: Vegetation Communities and Habitat Types



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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*).

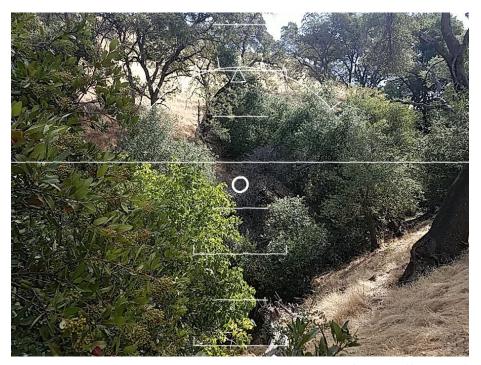


Photo 5: Oak woodlands with mature valley oak, and California coffeeberry (*Frangula california*) as understory.



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



CLEAN WATER ACT JURISDICTIONAL DELINEATION

LAND OF MORGAN SOLANO COUNTY, CALIFORNIA

Submitted to:

William Morgan 7545-B Pleasants Valley Road Vacaville, California 95688

Prepared by:

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Project No. WIM1801



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Figure 1: Regional Location

Figure 2: Project Site and Study Areas

Figure 3: Potential Waters of the United States

B: FIELD DATA SHEETS

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.* 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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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.

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

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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 headwater 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 headwater 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 headwater 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		Area	
	(linear feet	Width	(square feet	Area
	rounded to	(linear feet)	rounded to	(acre)
	nearest 10)		nearest 10)	
Potential Jurisdictional Tributaries (incl. Potentially Juris			_	T
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 13-1	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	0.00
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		0.05
, 0			2,080	
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.

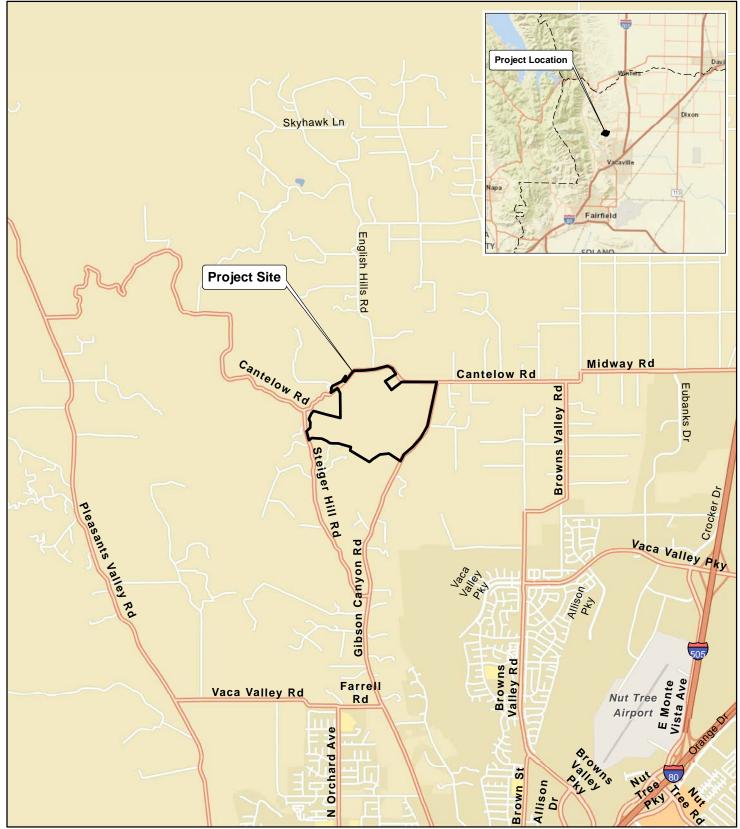
APPENDIX A

FIGURES

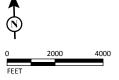
Figure 1: Regional Location

Figure 2: Project Site and Study Areas

Figure 3: Potential Waters of the United States

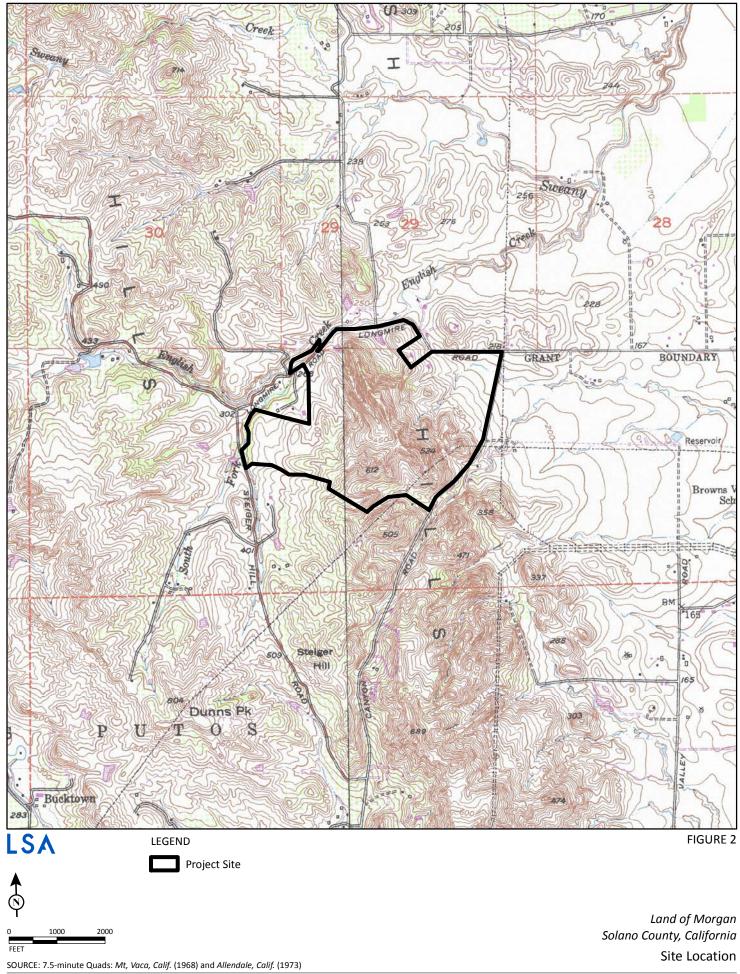


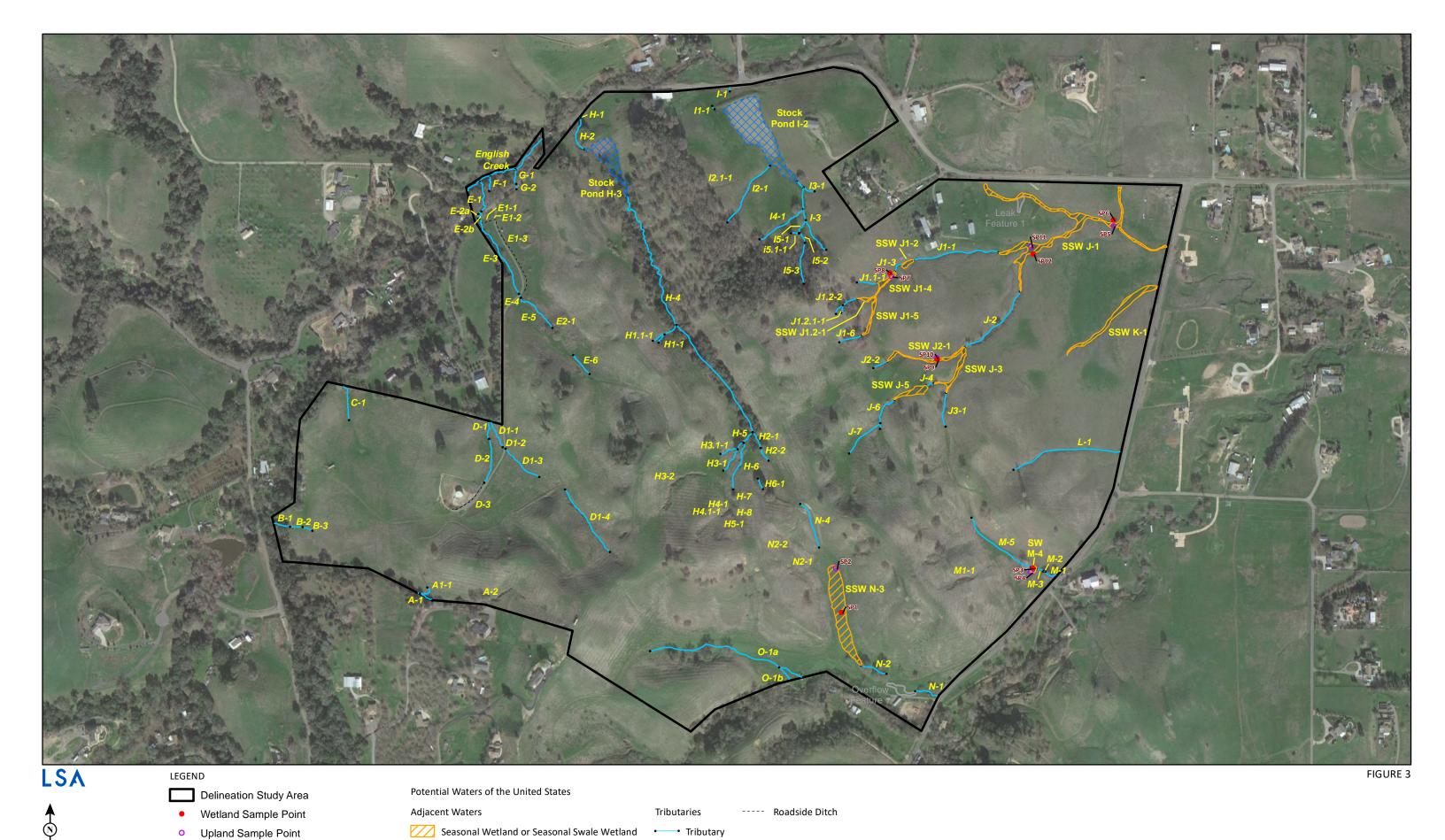
LSA FIGURE 1



Land of Morgan Solano County, California

Regional Location





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

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

Potential Non-Jurisdictional Features

Impoundments

Stock Pond

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: VACA	VILLE, SOLANO	Sampling Date: 9/12/1
Applicant/Owner: W. MORGAN		199331	State:	Sampling Point:
Investigator(s): B. WARZELHA	Sec	tion, Township, Ra	inge:	
Landform (hillslope, terrace, etc.):				
Subregion (LRR):				
Soil Map Unit Name:				
Are climatic / hydrologic conditions on the site typical for		ACCORD		
Are Vegetation, Soil, or Hydrology				present? Yes X No
Are Vegetation, Soil, or Hydrology			eeded, explain any answ	A STATE OF THE PROPERTY OF THE
SUMMARY OF FINDINGS – Attach site ma				
	No No No	Is the Sampled		No
Remarks: idealy to be ve-	viriled	in /		SPI
SP	rius			V
VEGETATION – Use scientific names of pl			<u>-</u>	
<u>Tree Stratum</u> (Plot size:) 1	% Cover Sp	ominant Indicator oecies? Status	Number of Dominant : That Are OBL, FACW	Species 7
2			Total Number of Dom Species Across All Str	inant 7
4			Percent of Dominant S	Secretary and the secretary an
Sapling/Shrub Stratum (Plot size:)		Fotal Cover	That Are OBL, FACW	
1			Prevalence Index wo	
2			Same Comments	Multiply by:
3			100 to 10	x 1 = x 2 =
4 5.				x 3 =
. 2		Fotal Cover	1-000.00.00.00.00.00.00.00	x 4 =
Herb Stratum (Plot size:)		y FAC	Barrier Barrier B	x 5 =
1. FESTUCA PERENNIS			Salara Salara Salara	(A) (B)
2. HORDEUM MARINUM		Y FAC	Dravelance Inde	- D/A -
3			Hydrophytic Vegetat	ex = B/A =
4			Dominance Test	
5			Prevalence Index	
6				laptations ¹ (Provide supporting
8.			data in Remar	ks or on a separate sheet)
590.	100 =	Fotal Cover	Problematic Hydr	ophytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size:)	,		1	19 M 72 75 1 P 25 7 1 M 5 7 1
1		****		oil and wetland hydrology must sturbed or problematic.
	D = 7	Total Cover	Hydrophytic Vegetation Present? Y	'es No
Remarks:			rieseitt Y	es_/\ NU
Grass dried up. h	sed he	ads,	grated &	xait % cover of measurable this time
			1	1.444

	(1)	
Sampling Point: _	V	
Sampling Form.		_

Profile Description: (Describe to the dep Depth Matrix		Features				
(inches) Color (moist) %	Color (moist)	%	Type ¹	Loc ²		Remarks
4-12 10 YR 3/2 95	2.5YR 3/6	5	C	PL	SL	15.
) 				(Ni
					, , , , , , , , , , , , , , , , , , , ,	
					<u> </u>	<u> </u>
						P
	R -				S T - S S	*
Type: C=Concentration, D=Depletion, RM	=Reduced Matrix CS=	Covered	or Coated	Sand Gr	ains ² l oc	cation: PL=Pore Lining, M=Matrix.
lydric Soil Indicators: (Applicable to all				ound Of		for Problematic Hydric Soils ³ :
	Sandy Redox					fuck (A9) (LRR C)
_ Histosol (A1) _ Histic Epipedon (A2)	Stripped Mate	(2) (2)			100	fuck (A10) (LRR B)
Black Histic (A3)	Loamy Muck		(F1)			ed Vertic (F18)
Hydrogen Sulfide (A4)	Loamy Gleye					arent Material (TF2)
Stratified Layers (A5) (LRR C)	Depleted Mat		/			(Explain in Remarks)
_ 1 cm Muck (A9) (LRR D)	✓ Redox Dark \$		(A)(A)		0,,,,,	
_ Depleted Below Dark Surface (A11)	Depleted Dar					
_ Thick Dark Surface (A12)	Redox Depre				3Indicators	of hydrophytic vegetation and
Sandy Mucky Mineral (S1)	Vernal Pools					hydrology must be present,
Sandy Gleyed Matrix (S4)		3 /				isturbed or problematic.
estrictive Layer (if present):					I	
estrictive Layer (ii present).					1	
						2: W
Type:	 8				Hydric Soil	Present? Vas X No
					Hydric Soil	Present? Yes No
Type: Depth (inches): Remarks:					Hydric Soil	Present? Yes X No
Type:					Hydric Soil	Present? Yes X No
Type:	id: check all that apply	v				
Type:					Secon	ndary Indicators (2 or more required)
Type:	Salt Crust (F	B11)			Secon	ndary Indicators (2 or more required) /ater Marks (B1) (Riverine)
Type:	Salt Crust (I	B11) (B12)			<u>Secon</u> W S	ndary Indicators (2 or more required) /ater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine)
Type:	Salt Crust (I Biotic Crust Aquatic Inve	B11) (B12) ertebrates			Secon W S D	dary Indicators (2 or more required) /ater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine) rift Deposits (B3) (Riverine)
Type:	Salt Crust (I Biotic Crust Aquatic Inve	B11) (B12) ertebrates sulfide Od	or (C1)		Secon W Si D D	dary Indicators (2 or more required) /ater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine) rift Deposits (B3) (Riverine) rainage Patterns (B10)
Type:	Salt Crust (I Biotic Crust Aquatic Inve	B11) (B12) ertebrates ulfide Od	or (C1) es along L		Secon	Idary Indicators (2 or more required) Idater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine) rift Deposits (B3) (Riverine) rainage Patterns (B10) ry-Season Water Table (C2)
Type:	Salt Crust (I Biotic Crust Aquatic Inve Hydrogen S Oxidized Rh	B11) (B12) ertebrates ulfide Od nizosphere	or (C1) es along L i Iron (C4))	<u>Secon</u> W S D D D D D ts (C3) D	Indary Indicators (2 or more required) //ater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine) rift Deposits (B3) (Riverine) rainage Patterns (B10) ry-Season Water Table (C2) rayfish Burrows (C8)
Type:	Salt Crust (I Biotic Crust Aquatic Inve Hydrogen S Oxidized Rh Presence of Recent Iron	B11) (B12) ertebrates ulfide Od nizosphere	or (C1) es along L i Iron (C4))	<u>Secon</u> W S D D D D D ts (C3) D	Idary Indicators (2 or more required) Idater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine) rift Deposits (B3) (Riverine) rainage Patterns (B10) ry-Season Water Table (C2)
Type:	Salt Crust (I Biotic Crust Aquatic Inve Hydrogen S Oxidized Rh Presence of Recent Iron	B11) (B12) ertebrates culfide Odinizosphere f Reduced Reductio	or (C1) es along L I Iron (C4) n in Tilled)	Secon W S D D ots (C3) D C C S) S	Indary Indicators (2 or more required) //ater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine) rift Deposits (B3) (Riverine) rainage Patterns (B10) ry-Season Water Table (C2) rayfish Burrows (C8)
Type:	Salt Crust (I Biotic Crust Aquatic Inve Hydrogen S Oxidized Rh Presence of Recent Iron	B11) (B12) ertebrates rulfide Od nizosphere f Reduced Reductio	or (C1) es along L d Iron (C4) n in Tilled C7))	Secon W Si D D ts (C3) D C Si) Si	adary Indicators (2 or more required) //ater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine) rift Deposits (B3) (Riverine) rainage Patterns (B10) ry-Season Water Table (C2) rayfish Burrows (C8) aturation Visible on Aerial Imagery (C9)
Type:	Salt Crust (I Biotic Crust Aquatic Inve Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S	B11) (B12) ertebrates rulfide Od nizosphere f Reduced Reductio	or (C1) es along L d Iron (C4) n in Tilled C7))	Secon W Si D D ts (C3) D C Si) Si	Indary Indicators (2 or more required) //ater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine) rift Deposits (B3) (Riverine) rainage Patterns (B10) ry-Season Water Table (C2) rayfish Burrows (C8) aturation Visible on Aerial Imagery (C9) hallow Aquitard (D3)
Type:	Salt Crust (I Biotic Crust Aquatic Inve Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S	B11) (B12) ertebrates ulfide Od- nizosphere f Reduced Reductio Surface (Cain in Rer	or (C1) es along L I Iron (C4) n in Tilled C7) narks)	Soils (C6	Secon W Si D D ts (C3) D C Si) Si	Indary Indicators (2 or more required) //ater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine) rift Deposits (B3) (Riverine) rainage Patterns (B10) ry-Season Water Table (C2) rayfish Burrows (C8) aturation Visible on Aerial Imagery (C9) hallow Aquitard (D3)
Type:	Salt Crust (I Biotic Crust Aquatic Inve Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S Other (Expla	B11) (B12) ertebrates ulfide Od nizosphere f Reduceo Reductio Surface (C	or (C1) es along L d Iron (C4) n in Tilled C7) narks)	Soils (C6	Secon W S D D C C C S S S F	Indary Indicators (2 or more required) I/ater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine) rift Deposits (B3) (Riverine) rainage Patterns (B10) ry-Season Water Table (C2) rayfish Burrows (C8) aturation Visible on Aerial Imagery (C8) hallow Aquitard (D3) AC-Neutral Test (D5)
Type:	Salt Crust (I Biotic Crust Aquatic Inve Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S Other (Explain	B11) (B12) ertebrates ulfide Od nizosphere f Reduceo Reductio Surface (C ain in Rer	or (C1) es along L d Iron (C4) n in Tilled C7) narks)	Soils (C6	Secon W S D D C C C S S S F	Indary Indicators (2 or more required) I/ater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine) rift Deposits (B3) (Riverine) rainage Patterns (B10) ry-Season Water Table (C2) rayfish Burrows (C8) aturation Visible on Aerial Imagery (C8) hallow Aquitard (D3) AC-Neutral Test (D5)
Type:	Salt Crust (I Biotic Crust Aquatic Inve Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S Other (Expla	B11) (B12) ertebrates ulfide Od nizosphere f Reduceo Reductio Surface (C ain in Rer	or (C1) es along L d Iron (C4) n in Tilled C7) narks)	Soils (C6	Secon W S D D C C C S S S F	Indary Indicators (2 or more required) //ater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine) rift Deposits (B3) (Riverine) rainage Patterns (B10) ry-Season Water Table (C2) rayfish Burrows (C8) aturation Visible on Aerial Imagery (C9) hallow Aquitard (D3)
Type:	Salt Crust (I Biotic Crust Aquatic Inve Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S Other (Explain No Depth (inch	B11) (B12) crtebrates ulfide Od nizosphere f Reduceo Reductio Surface (C ain in Rer nes): nes):	or (C1) es along L d Iron (C4) n in Tilled C7) narks)	Soils (C6	Secon	Indary Indicators (2 or more required) I/ater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine) rift Deposits (B3) (Riverine) rainage Patterns (B10) ry-Season Water Table (C2) rayfish Burrows (C8) aturation Visible on Aerial Imagery (C8) hallow Aquitard (D3) AC-Neutral Test (D5)
Type:	Salt Crust (I Biotic Crust Aquatic Inve Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S Other (Explain No Depth (inch	B11) (B12) crtebrates ulfide Od nizosphere f Reduceo Reductio Surface (C ain in Rer nes): nes):	or (C1) es along L d Iron (C4) n in Tilled C7) narks)	Soils (C6	Secon	Indary Indicators (2 or more required) I/ater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine) rift Deposits (B3) (Riverine) rainage Patterns (B10) ry-Season Water Table (C2) rayfish Burrows (C8) aturation Visible on Aerial Imagery (C8) hallow Aquitard (D3) AC-Neutral Test (D5)
Type:	Salt Crust (I Biotic Crust Aquatic Inve Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S Other (Explain No Depth (inch	B11) (B12) crtebrates ulfide Od nizosphere f Reduceo Reductio Surface (C ain in Rer nes): nes):	or (C1) es along L d Iron (C4) n in Tilled C7) narks)	Soils (C6	Secon	Indary Indicators (2 or more required) I/ater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine) rift Deposits (B3) (Riverine) rainage Patterns (B10) ry-Season Water Table (C2) rayfish Burrows (C8) aturation Visible on Aerial Imagery (C8) hallow Aquitard (D3) AC-Neutral Test (D5)
Type:	Salt Crust (I Biotic Crust Aquatic Inve Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S Other (Explain No Depth (inch	B11) (B12) crtebrates ulfide Od nizosphere f Reduceo Reductio Surface (C ain in Rer nes): nes):	or (C1) es along L d Iron (C4) n in Tilled C7) narks)	Soils (C6	Secon	Indary Indicators (2 or more required) I/ater Marks (B1) (Riverine) ediment Deposits (B2) (Riverine) rift Deposits (B3) (Riverine) rainage Patterns (B10) ry-Season Water Table (C2) rayfish Burrows (C8) aturation Visible on Aerial Imagery (C8) hallow Aquitard (D3) AC-Neutral Test (D5)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

(If needed, explain any answers in Remarks.)

Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	Yes Yes	No> No> No>	<u>x</u> x	Is the Sampled Area within a Wetland?	Yes	NoX
Remarks:	SRISP	-2 _				

VEGETATION - Use scientific names of plants.

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic?

Tree Stratum (Plot size:)		Species? Status	Dominance Test worksheet: Number of Dominant Species That Are OBL FACW or FAC: (A)
1			That Are OBL, FACW, or FAC: (A)
2			Total Number of Dominant
3			Species Across All Strata: 2 (B)
4			Percent of Dominant Species
Sapling/Shrub Stratum (Plot size:)		= Total Cover	That Are OBL, FACW, or FAC: (A/B)
1			Prevalence Index worksheet:
2			Total % Cover of: Multiply by:
3			OBL species x 1 =
4.			FACW species x 2 =
		<u></u>	FAC species x 3 =
1 2-		= Total Cover	FACU species x 4 =
Herb Stratum (Plot size: / M²)	OF THE PARTY		UPL species x 5 =
1. AVENA SP 2. TRITICUM AESTIVUM	50	Y UPL Y N/A	Column Totals: (A) (B)
3.			Prevalence Index = B/A =
4			Hydrophytic Vegetation Indicators:
5			Dominance Test is >50%
6			Prevalence Index is ≤3.0¹
7			Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
8			Problematic Hydrophytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size:)		= Total Cover	550 16 550 000 10 500 000
1	7:77		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2		= Total Cover	Hydrophytic
% Bare Ground in Herb Stratum % Cove	r of Biotic C	rust	Vegetation
Remarks:		51.6	1.
% - COVER DIFFICUL	T TO	DETERMI	NE
AT THIS T			

Sampling Point: 5P-2

Depth Matrix	Redox Features	
(inches) Color (moist) %	Color (moist) % Type ¹	
12 10 YR 4/3 100		SL_
	. — — — — — —	
		2 Coolean 2 Plane Blader Manualina
	M=Reduced Matrix, CS=Covered or Coated S	Sand Grains. ² Location: PL=Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils ³ :
lydric Soil Indicators: (Applicable to a		es anno esta de la companio del companio de la companio della comp
_ Histosol (A1)	Sandy Redox (S5)	1 cm Muck (A9) (LRR C)
Histic Epipedon (A2)	Stripped Matrix (S6)	2 cm Muck (A10) (LRR B)
Black Histic (A3)	Loamy Mucky Mineral (F1)	Reduced Vertic (F18)
Hydrogen Sulfide (A4)	Loamy Gleyed Matrix (F2)	Red Parent Material (TF2)
_ Stratified Layers (A5) (LRR C)	Depleted Matrix (F3)	Other (Explain in Remarks)
1 cm Muck (A9) (LRR D)	Redox Dark Surface (F6)	
Depleted Below Dark Surface (A11)	Depleted Dark Surface (F7)	*
Thick Dark Surface (A12)	Redox Depressions (F8)	³ Indicators of hydrophytic vegetation and
Sandy Mucky Mineral (S1)	Vernal Pools (F9)	wetland hydrology must be present,
_ Sandy Gleyed Matrix (S4)		unless disturbed or problematic.
Restrictive Layer (if present):		
Type:		
		L C
Depth (inches):		Hydric Soil Present? Yes No
Depth (inches):Remarks:		Hydric Soil Present? Yes No
Remarks:		Hydric Soil Present? Yes No
Pemarks: YDROLOGY		Hydric Soil Present? Yes No
YDROLOGY Wetland Hydrology Indicators:		Hydric Soil Present? Yes No Secondary Indicators (2 or more required)
YDROLOGY Vetland Hydrology Indicators:		
YDROLOGY Vetland Hydrology Indicators: Primary Indicators (minimum of one required Surface Water (A1)	red; check all that apply) Salt Crust (B11)	Secondary Indicators (2 or more required) Water Marks (B1) (Riverine)
YDROLOGY Vetland Hydrology Indicators: Primary Indicators (minimum of one require Surface Water (A1) High Water Table (A2)	red; check all that apply) Salt Crust (B11) Biotic Crust (B12)	Secondary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine)
YDROLOGY Vetland Hydrology Indicators: Primary Indicators (minimum of one requir Surface Water (A1) High Water Table (A2) Saturation (A3)	red; check all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13)	Secondary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Drift Deposits (B3) (Riverine)
YDROLOGY Vetland Hydrology Indicators: Primary Indicators (minimum of one requir Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nonriverine)	red; check all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1)	Secondary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Drift Deposits (B3) (Riverine) Drainage Patterns (B10)
YDROLOGY Vetland Hydrology Indicators: Primary Indicators (minimum of one requir Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nonriverine) Sediment Deposits (B2) (Nonriverine)	red; check all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Liv	Secondary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Drift Deposits (B3) (Riverine) Drainage Patterns (B10) ing Roots (C3) Dry-Season Water Table (C2)
YDROLOGY Vetland Hydrology Indicators: Primary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nonriverine) Sediment Deposits (B2) (Nonriverine) Drift Deposits (B3) (Nonriverine)	red; check all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) e) Oxidized Rhizospheres along Liv Presence of Reduced Iron (C4)	Secondary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Drift Deposits (B3) (Riverine) Drainage Patterns (B10) ing Roots (C3) Dry-Season Water Table (C2) Crayfish Burrows (C8)
YDROLOGY Netland Hydrology Indicators: Primary Indicators (minimum of one required 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)	red; check all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Liv Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled S	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) Soils (C6) Saturation Visible on Aerial Imagery (C6)
YDROLOGY Vetland Hydrology Indicators: Primary Indicators (minimum of one required 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 (red; check all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Liv Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Sign.	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) Soils (C6) Saturation Visible on Aerial Imagery (C6) Shallow Aquitard (D3)
Primary Indicators (minimum of one requirement) 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 (Water-Stained Leaves (B9)	red; check all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Liv Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled S	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) Soils (C6) Saturation Visible on Aerial Imagery (C6)
YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one requir 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 (Water-Stained Leaves (B9)	red; check all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Liv Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled S B7) 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) ring Roots (C3) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C8) Shallow Aquitard (D3) FAC-Neutral Test (D5)
Primary Indicators (minimum of one requirement of the property	red; check all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Double Oxidized Rhizospheres along Live Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Section (B7) 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) ring Roots (C3) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C8) Shallow Aquitard (D3) FAC-Neutral Test (D5)
Primary Indicators (minimum of one requirement) 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 (Water-Stained Leaves (B9) Field Observations: Surface Water Present? Ves Water Table Present? Yes	red; check all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Liv Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Sign Thin Muck Surface (C7) Other (Explain in Remarks) No Depth (inches): Depth (inches):	Secondary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Drift Deposits (B3) (Riverine) Drainage Patterns (B10) ring Roots (C3) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C8) Shallow Aquitard (D3) FAC-Neutral Test (D5)
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Primary Indicators (minimum of one requirements) 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 (Water-Stained Leaves (B9) Field Observations: Surface Water Present? Water Table Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes Saturation Present? Yes	red; check all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Liv Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Sign Thin Muck Surface (C7) Other (Explain in Remarks) No Depth (inches): Depth (inches):	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) Soils (C6) Saturation Visible on Aerial Imagery (C8) Shallow Aquitard (D3) FAC-Neutral Test (D5) Wetland Hydrology Present? Yes No
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Property Pro	red; check all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Double Oxidized Rhizospheres along Live Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Signature (C7) Other (Explain in Remarks) No Depth (inches): No Depth (inches): No Depth (inches): No Depth (inches):	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) Soils (C6) Saturation Visible on Aerial Imagery (C8) Shallow Aquitard (D3) FAC-Neutral Test (D5) Wetland Hydrology Present? Yes No
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Project/Site: LAND OF MORGAN	City/County: VACAVILLE, SOLAND CO Sampling Date: 9/17/18
	State: A Sampling Point:
Investigator(s): B. WARZECHA	
Landform (hillslope, terrace, etc.):	Local relief (concave, convex, none): Slope (%): 0 -3
	Long: Datum:
Soil Map Unit Name:	NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of ye	ear? Yes No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly	y disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology naturally pr	roblematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing	g sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No	Is the Sampled Area
Hydric Soil Present? Yes No	within a Wetland? Yes X No
Wetland Hydrology Present? Yes No	
Remarks: SP 6	cated in center of seasonal
8h	ockpoud, breached bern.
	Pry.
VEGETATION – Use scientific names of plants.	
Absolute Tree Stratum (Plot size:) % Cover	Speciae? Status
1	Number of Dominant Species
2	Total Number of Deminant
3	
4	Percent of Lominant Species
Sapling/Shrub Stratum (Plot size:)	= Total Cover That Are OBL, FACW, or FAC: (A/B)
1	Prevalence Index worksheet:
2	
3	
4	FACW species x 2 = FAC species x 3 =
5	= Total Cover
Herb Stratum (Plot size: M)	UPL species x 5 =
1. TYPHA SP. 30	Column Totals: (A) (B)
3 DUNCUS PHAEOCEPHAUM 30	Y FAC Prevalence Index = B/A =
4. CYNODON PACTYLUS 10	Hydrophytic Vegetation Indicators:
5	Dominance Test is >50%
6	Prevalence Index is ≤3.0¹
7	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
8	= Total Cover Problematic Hydrophytic Vegetation¹ (Explain)
Woody Vine Stratum (Plot size:)	_ = Total Cover
1	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2	
% Bare Ground in Herb Stratum 20 % Cover of Biotic 6	_ = Total Cover
2.55 (2-100)(2-100 (2-1	Crust Present? Yes No
Remarks:	

Sampling Point: 3

Profile Desc	cription: (Describe	to the depth	needed to docum	ent the i	ndicator	or confirm	the absenc	e of indicato	rs.)	
Depth	Matrix		Redox	Features						
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	_Loc ²	Texture	-111	Remarks	
12	10YR 3/2	70	7.5 Y/R 6/6	30	<u>C</u>	M,PL	l	0 0		
3						7				
		· — · · · ·						-		
								* *		
	-									
	X-									
¹Type: C=C	oncentration, D=Dep	letion, RM=R	Reduced Matrix, CS	=Covered	or Coate	ed Sand Gra	ains. ² L	ocation: PL=	Pore Lining, Ma	=Matrix.
	Indicators: (Applic								matic Hydric S	
Histosol	(A1)		Sandy Redo	x (S5)	8		1 cm	Muck (A9) (L	RR C)	
-	oipedon (A2)		Stripped Mat	55 35				Muck (A10) (
2	istic (A3)		Loamy Muck	400	(F1)			ced Vertic (F		
195555 00	en Sulfide (A4)		Loamy Gleye					Parent Materi	A 10 (10) 10 (
	d Layers (A5) (LRR (C)	Depleted Ma		18/0/11/81			r (Explain in F		
	ick (A9) (LRR D)	2,5	Redox Dark	Surface (F6)					
Deplete	d Below Dark Surfac	e (A11)	Depleted Da	rk Surfac	e (F7)					
Thick Da	ark Surface (A12)		Redox Depre	essions (F	-8)		3Indicator	s of hydrophy	tic vegetation	and
	Mucky Mineral (S1)		Vernal Pools	(F9)					nust be present	,
	Sleyed Matrix (S4)						unless	disturbed or	problematic.	
Restrictive	Layer (if present):									
Type:										
Depth (in	ches):						Hydric So	il Present?	Yes X	No
Remarks:						i	1	FO. 14 TO 1 S. PO. 15 TO 1 S. PO. 15 TO 1	102700000000000000000000000000000000000	
HYDROLO	GY									
Wetland Hy	drology Indicators:									
	cators (minimum of o		check all that apply)			Sec	ondary Indica	tors (2 or more	required)
The same of the sa	Water (A1)	no rodanoa,	Salt Crust (S				August 1	(B1) (Riverine	
	iter Table (A2)		Biotic Crust						posits (B2) (Ri	
Saturati			Aguatic Inv		(D12)		1,7			
									(B3) (Riverine	∌)
The second secon	larks (B1) (Nonriver		Hydrogen S			Listan Dool		Drainage Pat		0)
	nt Deposits (B2) (No							[선생] 라마양성 살아가 아니었다.	Nater Table (C	2)
	oosits (B3) (Nonrive	rine)	Presence o					Crayfish Burr		
17	Soil Cracks (B6)		Recent Iron			d Soils (C6)			sible on Aerial	Imagery (C9)
Property and the second	on Visible on Aerial I	magery (B7)	Thin Muck					Shallow Aqui	하면 이 가게 되었다.	
	tained Leaves (B9)		Other (Expl	ain in Re	marks)			FAC-Neutral	Test (D5)	
Field Obser	vations:									
Surface Wat			Depth (inc	7 C D P P R P R P R P R P R P R P R P R P R						
Water Table	Present? Y	es No	Depth (inc	hes):					,	
Saturation P	resent? Y	es No	Depth (inc	hes):		Wetla	nd Hydrolo	gy Present?	Yes	No
	oillary fringe)		N	78.7				3,		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Describe Re	corded Data (stream	gauge, moni	toring well, aerial p	hotos, pre	evious ins	pections), it	f available:			
Remarks:	-									

Project/Site: Land of Morgan	(City/County: Vacaville	e, Solano Co	Sampling	Date:9/	/12/2018
Applicant/Owner: William Morgan			State:	CA Sampling	Point:	9
nvestigator(s): B. Warzecha						
Landform (hillslope, terrace, etc.):		Local relief (concave,	convex, none):		Slope (%): 0 -5
Subregion (LRR):						
Soil Map Unit Name:						
Are climatic / hydrologic conditions on the site typical for this		70.000		17.		
Are Vegetation, Soil, or Hydrology sig	2000	VA AUTO DATE OF THE STATE OF TH	"Normal Circumsta		Yes X	No
Are Vegetation, Soil, or Hydrology na			eeded, explain any		217703040	*
SUMMARY OF FINDINGS – Attach site map s		50.00 MB0.00				ıres, etc.
Hydrophytic Vegetation Present? Yes No	77.0		200			
Hydric Soil Present? Yes No		Is the Sampled	i Area		×	
Wetland Hydrology Present? Yes No	×	within a Wetla	nd? Ye	esNo	/3	
Remarks: VEGETATION – Use scientific names of plants	55	3 12h4				
	Absolute	Dominant Indicator	Dominance Tes	st workshoot		
		Species? Status	Number of Dom		0	
1			That Are OBL, F		0	(A)
2			Total Number of	f Dominant	2	
3			Species Across	All Strata:		(B)
4		= Total Cover	Percent of Dom That Are OBL, F		0	(A/B)
Sapling/Stirub Stratum (Plot size.			Prevalence Ind		76-	
1				ver of:	Multiply by	r.
3			STORY OF THE RESERVE OF THE PERSON OF THE PE	x 1		
4.			100000000000000000000000000000000000000	x 2		
5.				x 3		
1 2		= Total Cover	FACU species	x 4	=	
Herb Stratum (Plot size: ML) 1. CARDUS PYCHOCEPHALUS	26	X N/A	UPL species	x 5	; =	
	410	FACU	Column Totals:	(A)		(B)
2. BROWNS HORBEACEUS 3. LACTUCA SERBIOLA	5	N FACU	Prevalenc	ce Index = B/A =		
4. HOEDEUM MEINUM	10	N FACU		egetation Indicat		
5. AVENA SP		N UPL		e Test is >50%	#15#	
6			Prevalence			
7			Morphologi	ical Adaptations ¹ (Provide sup	porting
8.				Remarks or on a s		
	100	= Total Cover	Problemation	c Hydrophytic Veg	etation' (Ex	(plain)
Woody Vine Stratum (Plot size:)			1			
1	-			ydric soil and wetla ess disturbed or pr		gy must
2						
		= Total Cover	Hydrophytic Vegetation		~	/
% Bare Ground in Herb Stratum % Cover	of Biotic Cr	rust	Present?	Yes	No	<u> </u>
Remarks:	- A					
Plants senes	cent					

	Ŷ.	(1)	
Sampling Point:		9	

Profile Description: (Describe to the dep Depth Matrix	Redox Features		
(inches) Color (moist) %	Color (moist) % Type ¹	Loc ² Texture	Remarks
12 10 YR 4/2 100		SL	
			where sold discover
¹ Type: C=Concentration, D=Depletion, RM=			re Lining, M=Matrix.
Hydric Soil Indicators: (Applicable to all	The state of the s	Indicators for Problema	Control of the Contro
Histosol (A1)	Sandy Redox (S5)	1 cm Muck (A9) (LR	
Histic Epipedon (A2)	Stripped Matrix (S6)	2 cm Muck (A10) (LI	
Black Histic (A3)	Loamy Mucky Mineral (F1)	Reduced Vertic (F18	
Hydrogen Sulfide (A4)	Loamy Gleyed Matrix (F2)	Red Parent Material	Market Street St
Stratified Layers (A5) (LRR C)	Depleted Matrix (F3)	Other (Explain in Re	marks)
1 cm Muck (A9) (LRR D)	Redox Dark Surface (F6)		
Depleted Below Dark Surface (A11)	Depleted Dark Surface (F7)	31	
Thick Dark Surface (A12)	Redox Depressions (F8)Vernal Pools (F9)	³ Indicators of hydrophytic	
Sandy Mucky Mineral (S1)Sandy Gleyed Matrix (S4)	Vernai Pools (F9)	wetland hydrology mus	7-12-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1
Restrictive Layer (if present):		unless disturbed or pro	oblematic.
Type:			X
Depth (inches):Remarks:		Hydric Soil Present?	/esNo
Remarks:		Hydric Soil Present?	/es No <u></u>
Remarks:		Hydric Soil Present?	/esNo
HYDROLOGY Wetland Hydrology Indicators:	tropock all that apply)		
Remarks: HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required	Company of the Compan	Secondary Indicator	s (2 or more required)
Remarks: HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required Surface Water (A1)	Salt Crust (B11)	Secondary Indicator — Water Marks (B	es (2 or more required)
Remarks: HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required Surface Water (A1) High Water Table (A2)	Salt Crust (B11) Biotic Crust (B12)	Secondary Indicator Water Marks (B Sediment Depo	s (2 or more required) (1) (Riverine) sits (B2) (Riverine)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3)	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13)	Secondary Indicator Water Marks (B Sediment Depo	s (2 or more required) (1) (Riverine) sits (B2) (Riverine) (33) (Riverine)
Remarks: HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nonriverine)	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1)	Secondary Indicator Water Marks (B Sediment Depo Drift Deposits (I Drainage Patter	rs (2 or more required) r1) (Riverine) sits (B2) (Riverine) r33) (Riverine) rns (B10)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nonriverine) Sediment Deposits (B2) (Nonriverine)	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1)	Secondary Indicator Water Marks (B Sediment Depo	rs (2 or more required) r1) (Riverine) sits (B2) (Riverine) r33) (Riverine) rns (B10)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nonriverine) Sediment Deposits (B2) (Nonriverine) Drift Deposits (B3) (Nonriverine)	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Li Presence of Reduced Iron (C4)	Secondary Indicator Water Marks (E Sediment Depo Drift Deposits (I Drainage Patter iving Roots (C3) Crayfish Burrov	s (2 or more required) (1) (Riverine) (3) (Riverine) (3) (Riverine) (5) (B10) (6) (C2) (7) (C8)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required 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)	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Li Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled	Secondary Indicator Water Marks (E Sediment Depo Drift Deposits (I Drainage Patter iving Roots (C3) Crayfish Burrov	s (2 or more required) (1) (Riverine) (3) (Riverine) (3) (Riverine) (5) (B10) (6) (C2) (7) (C8)
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HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required 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)	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Li Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled	Secondary Indicator Water Marks (B Sediment Depo Drift Deposits (I Drainage Patter iving Roots (C3) Dry-Season Wa Crayfish Burrov Soils (C6) Saturation Visib	rs (2 or more required) (1) (Riverine) (33) (Riverine) (33) (Riverine) (35) (Riverine) (36) (Riverine) (37) (Riverine) (38) (Riverine) (39) (R
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required 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 (B3)	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Li Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Thin Muck Surface (C7)	Secondary Indicator Water Marks (B Sediment Depo Drift Deposits (I Drainage Patter iving Roots (C3) Dry-Season Wa Crayfish Burrov Soils (C6) Saturation Visib Shallow Aquitar	rs (2 or more required) (1) (Riverine) (33) (Riverine) (33) (Riverine) (35) (Riverine) (36) (Riverine) (37) (Riverine) (38) (Riverine) (39) (R
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required 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 (B3) Water-Stained Leaves (B9) Field Observations:	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Li Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Thin Muck Surface (C7)	Secondary Indicator Water Marks (E Sediment Depo Drift Deposits (I Drainage Patter iving Roots (C3) Dry-Season Wa Crayfish Burrov Soils (C6) Saturation Visib Shallow Aquitar FAC-Neutral Te	rs (2 or more required) (1) (Riverine) (33) (Riverine) (33) (Riverine) (35) (Riverine) (36) (Riverine) (37) (Riverine) (38) (Riverine) (39) (R
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HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required 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 (B3) Water-Stained Leaves (B9) Field Observations: Surface Water Present? Yes I	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Li Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Thin Muck Surface (C7) Other (Explain in Remarks) No Depth (inches):	Secondary Indicator Water Marks (E Sediment Depo Drift Deposits (I Drainage Patter iving Roots (C3) Dry-Season Wa Crayfish Burrov Soils (C6) Saturation Visit Shallow Aquitar FAC-Neutral Te	rs (2 or more required) ri) (Riverine) sits (B2) (Riverine) ris (B10) ris (B10) ris (C8) ris (C8) ris (C8) ris (D3) ris (D3) ris (D5)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required 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) Field Observations: Surface Water Present? Water Table Present? Yes Saturation Present? Yes Includes capillary fringe)	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Li Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Thin Muck Surface (C7) Other (Explain in Remarks) No Depth (inches): No Depth (inches):	Secondary Indicator Water Marks (E Sediment Depo Drift Deposits (I Drainage Patter iving Roots (C3) Dry-Season Wa Crayfish Burrov Soils (C6) Saturation Visib Shallow Aquitar FAC-Neutral Te	rs (2 or more required) (1) (Riverine) (3) (Riverine) (4) (B10) (5) (C2) (6) (C3) (7) (C4) (7) (C5) (8) (C5) (9) (C5) (9) (C5) (9) (C5) (9) (C5) (9) (C5) (9) (C5)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required 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 (B3) Water-Stained Leaves (B9) Field Observations: Surface Water Present? Yes I	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Li Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Thin Muck Surface (C7) Other (Explain in Remarks) No Depth (inches): No Depth (inches):	Secondary Indicator Water Marks (E Sediment Depo Drift Deposits (I Drainage Patter iving Roots (C3) Dry-Season Wa Crayfish Burrov Soils (C6) Saturation Visib Shallow Aquitar FAC-Neutral Te	rs (2 or more required) ri) (Riverine) sits (B2) (Riverine) ris (B10) ris (B10) ris (C8) ris (C8) ris (C8) ris (D3) ris (D3) ris (D5)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required 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) Field Observations: Surface Water Present? Water Table Present? Yes Saturation Present? Yes Includes capillary fringe)	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Li Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Thin Muck Surface (C7) Other (Explain in Remarks) No Depth (inches): No Depth (inches):	Secondary Indicator Water Marks (E Sediment Depo Drift Deposits (I Drainage Patter iving Roots (C3) Dry-Season Wa Crayfish Burrov Soils (C6) Saturation Visib Shallow Aquitar FAC-Neutral Te	rs (2 or more required) ri) (Riverine) sits (B2) (Riverine) ris (B10) ris (B10) ris (C8) ris (C8) ris (C8) ris (D3) ris (D3) ris (D5)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required 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) Field Observations: Surface Water Present? Water Table Present? Yes Saturation Present? Yes Includes capillary fringe)	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Li Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Thin Muck Surface (C7) Other (Explain in Remarks) No Depth (inches): No Depth (inches):	Secondary Indicator Water Marks (E Sediment Depo Drift Deposits (I Drainage Patter iving Roots (C3) Dry-Season Wa Crayfish Burrov Soils (C6) Saturation Visib Shallow Aquitar FAC-Neutral Te	rs (2 or more required) ri) (Riverine) sits (B2) (Riverine) ris (B10) ris (B10) ris (C8) ris (C8) ris (C8) ris (D3) ris (D3) ris (D5)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required and 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 (B3) Water-Stained Leaves (B9) Field Observations: Surface Water Present? Yes Includes Capillary fringe) Describe Recorded Data (stream gauge, moderate)	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Li Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Thin Muck Surface (C7) Other (Explain in Remarks) No Depth (inches): No Depth (inches):	Secondary Indicator Water Marks (E Sediment Depo Drift Deposits (I Drainage Patter iving Roots (C3) Dry-Season Wa Crayfish Burrov Soils (C6) Saturation Visib Shallow Aquitar FAC-Neutral Te	rs (2 or more required) ri) (Riverine) sits (B2) (Riverine) ris (B10) ris (B10) ris (C8) ris (C8) ris (C8) ris (D3) ris (D3) ris (D5)
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Project/Site: Land of Morgan		City/County:	Vacaville	, Solano Co	Sampling Date:9/12/201
Applicant/Owner: William Morgan		Date		State:CA	_ Sampling Point:
Investigator(s): B. Warzecha					
Landform (hillslope, terrace_etc.):		Local relief (concave,	convex, none):	Slope (%):
Subregion (LRR):					
Soil Map Unit Name:					
Are climatic / hydrologic conditions on the site typical for this ti	me of year	ar? Yes >	No	(If no, explain in	Remarks.)
Are Vegetation, Soil, or Hydrology sign					s" present? Yes X No
Are Vegetation, Soil, or Hydrology nat				eeded, explain any ansv	
SUMMARY OF FINDINGS – Attach site map sh					
Hydrophytic Vegetation Present? Yes X No.		lo the	Compled	Avan	
Hydric Soil Present? Yes X No			Sampled a Wetlar	nd? Yes	× No
Wetland Hydrology Present? Yes X No				10: 165	
Remarks:		SF-	2	swale	2
		1		211111	and patch
				Wetts	moi parcen
VEGETATION – Use scientific names of plants					
	Absolute	Dominant I	ndicator	Dominance Test wo	orkehoot:
		Species?		Number of Dominant	
1				That Are OBL, FACV	
2				Total Number of Dom	ninant
3				Species Across All St	,
4				Percent of Dominant	
Sapling/Shrub Stratum (Plot size:)		= Total Cov	er	That Are OBL, FACV	V, or FAC: (A/B
1		·		Prevalence Index w	orksheet:
2.				Total % Cover of	f: Multiply by:
3				OBL species	x 1 =
4					x 2 =
5					x 3 =
Herb Stratum (Plot size: 1 m ²)		= Total Cov	er	18	x 4 =
1. JUNIUS SP.	45	YF	ACW	The second secon	x 5 = (A) (B)
2. FISTUCK PERENNIS	30	1	FAC	Column Totals.	(A) (B)
3. CYNODON DACTYLON	10		FACU	Prevalence Inde	lex = B/A =
4. XNTHUM SPINDJUM	5	<u>H</u>	FACU	Hydrophytic Vegeta	
5				Dominance Test	
6				Prevalence Index	
7				data in Rema	daptations ¹ (Provide supporting arks or on a separate sheet)
8	90			Problematic Hyd	drophytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size:)	-70	= Total Cov	er		
1					soil and wetland hydrology must
2				pe present, unless di	isturbed or problematic.
		= Total Cov	er	Hydrophytic Vegetation	
% Bare Ground in Herb Stratum % Cover o	f Biotic C	rust		Present?	Yes No
Remarks:					

Sampling Point: 5

Depth	Matrix		Redo					
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	_Loc²	Texture	Remarks
12	10 YR 3/2	90	7.5 48616	10		PL	SL	
	W 	-						-
	0							-
					-			-
					73	7		
Type: C=C	oncentration, D=Dep	etion, RM=	Reduced Matrix, CS	S=Covered	d or Coate	ed Sand Gra	ains.	² Location: PL=Pore Lining, M=Matrix.
lydric Soil	Indicators: (Applica	able to all	LRRs, unless other	wise note	ed.)		Indicat	ors for Problematic Hydric Soils ³ :
Histoso	I (A1)		Sandy Redo	ox (S5)			1 0	m Muck (A9) (LRR C)
	pipedon (A2)		Stripped Ma					m Muck (A10) (LRR B)
	istic (A3)		Loamy Muc		I (F1)			duced Vertic (F18)
	en Sulfide (A4)		Loamy Gley	The second secon			- CO. CO.	d Parent Material (TF2)
	d Layers (A5) (LRR C	:)	Depleted M		· -/			ner (Explain in Remarks)
	uck (A9) (LRR D)		× Redox Dark		(F6)			io (Explair III (orialito)
	d Below Dark Surface	e (A11)	Depleted Da		10 05			
	ark Surface (A12)	, , , , ,	Redox Depr				3Indicat	ors of hydrophytic vegetation and
- Marine Carlot	Mucky Mineral (S1)		Vernal Pool		. 0)			and hydrology must be present,
	Gleyed Matrix (S4)		vernari cor	3 (1 3)				ss disturbed or problematic.
	Layer (if present):						T	of distarbed of problematic.
COLLICEIVE	Layer (ii present).							
Truncal							1	X
Type:							l	/\
Depth (in	iches):			7			Hydric \$	Soil Present? Yes No No
Depth (in Remarks:				*			Hydric \$	Soil Present? Yes No No
Depth (in Remarks:)GY						Hydric	Soil Present? Yes No No
Depth (in Remarks: YDROLC Vetland Hy	OGY drology Indicators:	ne required	t: check all that apply	v)				
Depth (in Depth	OGY drology Indicators: cators (minimum of o	ne required	Enter the Property of State of	Commence of the Commence of th				econdary Indicators (2 or more required)
Depth (in Depth	OGY drology Indicators: cators (minimum of o Water (A1)	ne requirec	Salt Crust	(B11)				econdary Indicators (2 or more required) _ Water Marks (B1) (Riverine)
Depth (in temarks: /DROLO /etland Hy rimary Indi Surface High W	OGY drology Indicators: cators (minimum of o Water (A1) ater Table (A2)	ne requirec	Salt Crust Biotic Crus	(B11) st (B12)				econdary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine)
Depth (in Permarks: YDROLO Vetland Hy Primary Indi Surface High Wa Saturati	order (A1) ater Table (A2) on (A3)		Salt Crust Biotic Crus Aquatic Inv	(B11) st (B12) vertebrate				econdary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Drift Deposits (B3) (Riverine)
Depth (in Permarks: YDROLC Yetland Hy Primary Indi Surface High Water M	oGY rdrology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) Marks (B1) (Nonriveri	ne)	Salt Crust Biotic Crust Aquatic Int Hydrogen	(B11) st (B12) vertebrate Sulfide Od	dor (C1)		Se	econdary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Drift Deposits (B3) (Riverine) Drainage Patterns (B10)
Depth (in Remarks: YDROLC Vetland Hy Primary Indi Surface High Water Management Water Management Sedime	ogy drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) Marks (B1) (Nonriveri nt Deposits (B2) (Nor	ne) nriverine)	Salt Crust Biotic Crust Aquatic Int Hydrogen	(B11) st (B12) vertebrate Sulfide Od	dor (C1)	Living Root	Se	econdary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Drift Deposits (B3) (Riverine)
Depth (in Remarks: YDROLC Vetland Hy Primary Indi Surface High Water M Sedime	oGY rdrology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) Marks (B1) (Nonriveri	ne) nriverine)	Salt Crust Biotic Crust Aquatic Int Hydrogen	(B11) st (B12) vertebrate Sulfide Oo Rhizosphe	dor (C1) res along		Se	econdary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Drift Deposits (B3) (Riverine) Drainage Patterns (B10)
Popth (in Remarks: YDROLO Vetland Hy Primary Indi Surface High Water M Saturati Water M Sedime Drift De	ogy drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) Marks (B1) (Nonriveri nt Deposits (B2) (Nor	ne) nriverine)	Salt Crust Biotic Crust Aquatic Inv Hydrogen Oxidized F	(B11) st (B12) vertebrate Sulfide Oc Rhizosphei of Reduce	dor (C1) res along ed Iron (C	4)	<u>Se</u> ts (C3)	econdary 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)
Popth (in Popth	oGY drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) Marks (B1) (Nonriveri nt Deposits (B2) (Non posits (B3) (Nonriver Soil Cracks (B6)	ne) nriverine) ine)	Salt Crust Biotic Crust Aquatic Inv Hydrogen Oxidized R Presence of Recent Iro	(B11) st (B12) vertebrate Sulfide Oc Rhizospher of Reduce n Reduction	dor (C1) res along ed Iron (Co on in Tille	4)	<u>Se</u> ts (C3)	econdary 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 (C5)
Popth (in Remarks: YDROLO Vetland Hy Primary Indi Surface High W Saturati Water N Sedime Drift De Surface Inundat	oGY drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) Marks (B1) (Nonriveri nt Deposits (B2) (Non posits (B3) (Nonriver Soil Cracks (B6) ion Visible on Aerial In	ne) nriverine) ine)	Salt Crust Biotic Crust Aquatic Int Hydrogen Oxidized R Presence of Recent Iro Thin Muck	(B11) st (B12) vertebrate Sulfide Oc Rhizospher of Reduce n Reduction	dor (C1) res along d Iron (C4 on in Tille C7)	4)	<u>Se</u> ts (C3)	econdary 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)
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Project/Site: Land of Morgan	City/County: Vacaville	e, Solano Co	_ Sampling Date:9/12/2018
Applicant/Owner: William Morgan			
Investigator(s): B. Warzecha			
Landform (hillslope, terrace, etc.):	Local relief (concave,	convex, none):	Slope (%): 3-1
Subregion (LRR): Lat: _		Long:	Datum:
Soil Map Unit Name:			
Are climatic / hydrologic conditions on the site typical for this time of			
Are Vegetation, Soil, or Hydrology significar			present? YesX No
Are Vegetation, Soil, or Hydrology naturally		eeded, explain any answ	
SUMMARY OF FINDINGS - Attach site map showi			
Hydrophytic Vegetation Present? Yes NoX			
Hydric Soil Present? Yes No	Is the Sampledwithin a Wetlar		No_ <u></u> _
Wetland Hydrology Present? Yes NoX	DOSC SANGE ENGLE DIVERSALL S		
Remarks:	SF-5 JSF	2.6	
	V		
VEGETATION – Use scientific names of plants.			
Absolu	te Dominant Indicator ver Species? Status	Dominance Test wor	_
Tree Stratum (Plot size:) % Cov 1		Number of Dominant S That Are OBL, FACW,	
2.			
3.		Total Number of Domi Species Across All Str	
4.		Percent of Dominant S	Species
Sapling/Shrub Stratum (Plot size:)	= Total Cover	That Are OBL, FACW	
1		Prevalence Index wo	orksheet:
2.		Total % Cover of:	Multiply by:
3.		OBL species	x 1 =
4		The same of the sa	x 2 =
5			x 3 =
Herb Stratum (Plot size: 122)	= Total Cover		x 4 =
1. AVENA SP 45	Y UTL		x 5 = (A) (B)
2 BROWNS HORDEACEUS 30	Y FACU	Column rotals.	(A) (D)
3. LARBUUS PYCNOCEPHAUS IC	N N/A	Prevalence Inde	ex = B/A =
4. HORDEUM MRINUM 10	N FACU	Hydrophytic Vegetat	
5. LACTUCA SECTRICIA 5	- N FACU	Dominance Test i	
6		Prevalence Index	SACTOR MANAGEMENT OF THE PROPERTY OF THE PROPE
7		data in Remar	laptations ¹ (Provide supporting ks or on a separate sheet)
8		Problematic Hydr	rophytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size:)	O = Total Cover	No. 1992 Aprophisms Commission (1997)	100 V 100
1		¹ Indicators of hydric s	oil and wetland hydrology must
2		be present, unless dis	sturbed or problematic.
	= Total Cover	Hydrophytic Vegetation	21
% Bare Ground in Herb Stratum % Cover of Biot	ic Crust		res No
Remarks:		1	

	Profile Des	cription: (Describe to the dep	oth needed to docu	ment the indicator	or confirm	the absence of	indicators.)
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. This Coated Sand Sand Sand Sand Sand Sand Sand San	Depth						
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. Ptyper (Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Sandy Redox (S5) Indicators for Problematic Hydric Soils ³ : Histosol (A2) Stripped Matrix (S6) 2 cm Muck (A9) (LRR C) Histosol (A2) Stripped Matrix (S6) 2 cm Muck (A10) (LRR B) Black Histic (A3) Lanny Mucky Mineral (F1) Reduced Vertic (F18) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Red Parent Material (TF2) Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (A9) (LRR C) Redox Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F6) Depleted Below Dark Surface (A12) Redox Depressions (F8) Sandy Mucky Mineral (S1) Vernal Pools (F9) Vernal Pools (F9) Sandy Gleyed Matrix (S4) Restrictive Layer (if present): Type: Depth (inches): Hydric Soil Present? Yes No PREMARKS: YPROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required: check all that apply) Sediment Deposits (62) (Riverine) Surface Water (A1) Salt Crust (B12) Sediment Deposits (62) (Riverine) Surface Water (A1) Salt Crust (B12) Sediment Deposits (62) (Riverine) Water Marks (B1) (Nonriverine) Hydrogen Sulfide Odor (C1) Drift Deposits (63) (Riverine) Water Marks (B1) (Nonriverine) Oxidized Rhizospheres along Living Roots (C3) Dry-Season Water Table (C2) Drift Deposits (B3) (Nonriverine) Presence of Reduced Iron (C4) Saturation Visible on Aerial Imagery (F) Inundation Visible on Aerial Imagery (F7) Thin Muck Surface (C7) Saturation (Visible on Aerial Imagery (F7) Thin Muck Surface (C7) Saturation Visible on Aerial Imagery (F7) Thin Muck Surface (C7) Saturation Visible on Aerial Imagery (F7)	(inches)		Color (moist)	%Type'	_Loc ² _		Remarks
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histosol (A2) Black Histic (A3) Black Histic (A3) Hydrogen Sulfide (A4) Hydrogen Sulfide (A4) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Tom Muck (A9) (LRR B) Reduced Vertic (F18) Red	1-12	10412 43 100				21	
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histosol (A2) Black Histic (A3) Black Histic (A3) Hydrogen Sulfide (A4) Hydrogen Sulfide (A4) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Tom Muck (A9) (LRR B) Reduced Vertic (F18) Red							
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histosol (A2) Black Histic (A3) Black Histic (A3) Hydrogen Sulfide (A4) Hydrogen Sulfide (A4) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Tom Muck (A9) (LRR B) Reduced Vertic (F18) Red		·	49		,		
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histosol (A2) Black Histic (A3) Black Histic (A3) Hydrogen Sulfide (A4) Hydrogen Sulfide (A4) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Tom Muck (A9) (LRR B) Reduced Vertic (F18) Red			% 				
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Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosal (A1) Sandy Redox (S5)							
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosal (A1) Sandy Redox (S5)	Type: C=C	Concentration D=Depletion RM	I=Reduced Matrix C	S=Covered or Coate	ed Sand Gra	ains ² l ocat	ion: PL=Pore Lining M=Matrix
Histosol (A1) Sandy Redox (S5) 1 cm Muck (A9) (LRR C) Histic Epipedon (A2) Stripped Matrix (S6) 2 cm Muck (A10) (LRR B) Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Vertic (F18) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Red Parent Material (TF2) Stratified Layers (A5) (LRR C) Depleted Matrix (F2) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Depleted Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) Vernal Pools (F9) Vernal Pools (F0) Vernal Pools (F9) Vernal Pools (F0) Ve					od Odrid Oil		
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Water Marks (B1) (Nonriverine)	Saturat	ion (A3)					
Sediment Deposits (B2) (Nonriverine) Drift Deposits (B3) (Nonriverine) Drift Deposits (B3) (Nonriverine) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery (B7) Oxidized Rhizospheres along Living Roots (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (Shallow Aquitard (D3)	Water I	Marks (B1) (Nonriverine)					
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	Surface				The state of the s		
		ion Visible on Aerial Imagery (E	37) Thin Muck	Surface (C7)		Shall	llow Aquitard (D3)
Surface Water Present? Yes No Depth (inches):	Inundat Water-S Field Obse	Stained Leaves (B9) rvations:	. 4	MANAGE OF STREET			

Water Table Present?

Saturation Present?

Remarks:

Yes ____ No ___ Depth (inches):

(includes capillary fringe)

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

__ No ____ Depth (inches): __

Wetland Hydrology Present? Yes _

WETLAND DETERMINATION DATA FORM - Arid West Region Project/Site: Land of Morgan City/County: Vacaville, Solano Co Sampling Date: 9/12/2018 State: <u>CA</u> Sampling Point: ___ Applicant/Owner: William Morgan Investigator(s): B. Warzecha Section, Township, Range: T7N R1W Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): _____ Slope (%): 0 - 2 _____ Lat: ______ Long: ______ Datum: _____ Subregion (LRR): Soil Map Unit Name: ___ NWI classification: Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.) Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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. Yes X No Hydrophytic Vegetation Present? Is the Sampled Area Yes _ X__ No ____ Hydric Soil Present? within a Wetland? Yes X No____ Wetland Hydrology Present? Remarks: Willand VEGETATION - Use scientific names of plants. Absolute Dominant Indicator Dominance Test worksheet: Absolute Dominant Indicator

% Cover Species? Status Tree Stratum (Plot size: _____) Number of Dominant Species That Are OBL, FACW, or FAC: Total Number of Dominant Species Across All Strata: Percent of Dominant Species = Total Cover That Are OBL, FACW, or FAC: Sapling/Shrub Stratum (Plot size: ____) Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = __ = Total Cover Herb Stratum (Plot size: x 5 = 1. FESTUCA PE Column Totals: _____ (A) _____ (B) FACW 2 700000 Prevalence Index = B/A = NA 4. BROWS HORDEACEUS FACU Hydrophytic Vegetation Indicators: __ Dominance Test is >50% Prevalence Index is ≤3.01 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) | 0 0 = Total Cover Woody Vine Stratum (Plot size: ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic = Total Cover Vegetation % Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____ Present? Plants senescent, grazed.

	(-)
2 2 0	(7)
ampling Point: _	1

	ription: (Describe			-		-11			
Depth (inches)	Color (moist)	%	Color (m		Features %	Type ¹	Loc ²	- Texture	Remarks
(inches)	10YR 2/3	70	7.5 YR	5/6	30	T.	M	CL	
10_	10/2 0/3		1.3 11	2/10	50		1 -1	2 Press	
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	oncentration, D=Dep						ed Sand (² Location: PL=Pore Lining, M=Matrix.
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	pipedon (A2)		The state of the s	ipped Ma				C - C - C - C - C - C - C - C - C - C -	cm Muck (A10) (LRR B)
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	ark Surface (A12)			dox Depre		F8)			tors of hydrophytic vegetation and
	Mucky Mineral (S1)		Ve	rnal Pools	(F9)				and hydrology must be present,
	Gleyed Matrix (S4)							unle	ss disturbed or problematic.
Restrictive	Layer (if present):								
Type:									99
	ches):		7					Hydric	Soil Present? Yes X No
Type:	ches):							Hydric	Soil Present? Yes X No
Type: Depth (in	ches):							Hydric	Soil Present? Yes X No
Type: Depth (in Remarks:								Hydric	Soil Present? Yes X No
Type: Depth (in Remarks:								Hydric	Soil Present? Yes X No
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Type:	GY drology Indicators: cators (minimum of of water (A1) ater Table (A2) on (A3) larks (B1) (Nonriver nt Deposits (B2) (No posits (B3) (Nonriver Soil Cracks (B6) on Visible on Aerial tained Leaves (B9) vations: er Present? Present?	rine) nriverine) rine) Imagery (E	Si Bi Ai Pi Pi Ri 37) Ti O	alt Crust (iotic Crust quatic Inv ydrogen S xidized R resence o ecent Iror hin Muck ther (Expl Depth (inc	B11) t (B12) ertebrate Sulfide Ochizosphe of Reduce of Reducti Surface (lain in Re thes): thes):	dor (C1) res along d Iron (C on in Tille C7) marks)	4) ed Soils (C	Sa	econdary 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)
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Type:	drology Indicators: cators (minimum of of water (A1) ater Table (A2) on (A3) larks (B1) (Nonriver on Deposits (B2) (No posits (B3) (Nonriver Soil Cracks (B6) on Visible on Aerial stained Leaves (B9) vations: er Present? Present? Yesent? Yesent?	rine) nriverine) Imagery (E 'es 'es	Si	alt Crust (iotic Crusi quatic Inv ydrogen S xidized R resence o ecent Iror hin Muck ther (Expl Depth (inc	B11) t (B12) ertebrate Sulfide Ochizosphe of Reduce Reducti Surface (lain in Re hes): hes):	dor (C1) res along d Iron (C on in Tille C7) marks)	4) ed Soils (C	oots (C3)	econdary 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)
Type:	drology Indicators: cators (minimum of of water (A1) ater Table (A2) on (A3) larks (B1) (Nonriver on Deposits (B2) (No posits (B3) (Nonriver Soil Cracks (B6) on Visible on Aerial stained Leaves (B9) vations: er Present? Present? Yesent? Yesent?	rine) nriverine) Imagery (E 'es 'es	Si	alt Crust (iotic Crusi quatic Inv ydrogen S xidized R resence o ecent Iror hin Muck ther (Expl Depth (inc	B11) t (B12) ertebrate Sulfide Ochizosphe of Reduce Reducti Surface (lain in Re hes): hes):	dor (C1) res along d Iron (C on in Tille C7) marks)	4) ed Soils (C	oots (C3)	econdary 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)

WETLAND DETERMINATION DATA FORM - Arid West Region Project/Site: Land of Morgan _____ City/County: Vacaville, Solano Co Sampling Date: 9/12/2018 State: <u>CA</u> Sampling Point: <u>&</u> Applicant/Owner: William Morgan Section, Township, Range: T7N R1W Investigator(s): B. Warzecha Landform (hillslope, terrace, etc.): Slope (%): 30 ______ Lat: ______ Long: ______ Datum: _____ Subregion (LRR): NWI classification: ____ Soil Map Unit Name: Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No _____ (If no, explain in Remarks.) Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____ (If needed, explain any answers in Remarks.) Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes _____ No _ Is the Sampled Area Hydric Soil Present? within a Wetland? Wetland Hydrology Present? Yes No Remarks: VEGETATION - Use scientific names of plants. Absolute Dominant Indicator **Dominance Test worksheet:** Tree Stratum (Plot size: _____) % Cover Species? Status Number of Dominant Species That Are OBL, FACW, or FAC: Total Number of Dominant Species Across All Strata: Percent of Dominant Species ____ = Total Cover That Are OBL, FACW, or FAC: Sapling/Shrub Stratum (Plot size: ____) Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species _____ x 1 = _____ FACW species x 2 = ____ FAC species _____ x 3 = _____ _____ = Total Cover FACU species _____ x 4 = _____ Herb Stratum (Plot size: __ l w 2 ____ x 5 = ____ UPL species __ 1 TAENIATHERUM CAPUT-MEDUSAE Column Totals: _____ (A) ____ (B) 2 BEOWS HORREACENS 10 FACU 3. CENTAVICEA SOLITIMU ZO NIA Prevalence Index = B/A = 7 Hydrophytic Vegetation Indicators: __ Dominance Test is >50% Prevalence Index is ≤3.0¹ Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) 100 = Total Cover Woody Vine Stratum (Plot size: ____) ¹Indicators of hydric soil and wetland hydrology must 1. be present, unless disturbed or problematic. ____ = Total Cover Hydrophytic Vegetation Present? % Bare Ground in Herb Stratum _____ % Cover of Biotic Crust ____ Remarks:

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Sampling Point: &	,

Profile Des	cription: (Descri	be to the dept	h needed to docu	ment the i	ndicator	or confirm	the absence o	f indicators.)
Depth	Matri			x Feature		1 - 2	T202	Domodes
(inches)	Color (moist)	The second secon	Color (moist)		Type ¹	_Loc ²	Texture	Remarks
12	10YR 2/3	100					SL_	
	*							*
								
	-			-			-	
					-			
¹Type: C=C	Concentration, D=I	Depletion, RM=	Reduced Matrix, C	S=Covered	d or Coate	ed Sand Gra	ains. ² Loca	tion: PL=Pore Lining, M=Matrix.
			RRs, unless other					or Problematic Hydric Soils ³ :
Histoso			Sandy Red				1 cm Mu	ick (A9) (LRR C)
	pipedon (A2)		Stripped M				200	ick (A10) (LRR B)
	listic (A3)		Loamy Mu		I (F1)			d Vertic (F18)
	en Sulfide (A4)		Loamy Gle				Red Par	ent Material (TF2)
Stratifie	d Layers (A5) (LF	RR C)	Depleted M				Other (E	explain in Remarks)
	uck (A9) (LRR D)		Redox Dar					
	ed Below Dark Sur		Depleted D		Contract of the second			
	ark Surface (A12)		Redox Dep		F8)			f hydrophytic vegetation and
	Mucky Mineral (S		Vernal Poo	ls (F9)				ydrology must be present,
	Gleyed Matrix (S4	7.4					unless dis	turbed or problematic.
5325700000	Layer (if present	t):						
Type:								
Depth (in	nches):						Hydric Soil P	Present? Yes No _X
Remarks:								
4								
HYDROLC	GY	V.						
	drology Indicato			L.A				
		of one required	; check all that app	C SCOWCON LINES			29/507	ary Indicators (2 or more required)
	: Water (A1)		Salt Crust	70			27-20	ter Marks (B1) (Riverine)
200	ater Table (A2)		Biotic Cru					diment Deposits (B2) (Riverine)
	ion (A3)			vertebrate			Dri	ft Deposits (B3) (Riverine)
	Marks (B1) (Nonri		Hydrogen					ainage Patterns (B10)
Sedime	nt Deposits (B2) ((Nonriverine)	Oxidized	Rhizosphe	res along	Living Root	ts (C3) Dry	/-Season Water Table (C2)
Drift De	posits (B3) (Nonr	riverine)	Presence	of Reduce	ed Iron (C4	1)	Cra	ayfish Burrows (C8)
Surface	Soil Cracks (B6)		Recent Iro	n Reducti	on in Tille	d Soils (C6)	Sat	turation Visible on Aerial Imagery (C9)
Inundat	ion Visible on Aer	ial Imagery (B7) Thin Mucl	Surface (C7)		Sha	allow Aquitard (D3)
Water-S	Stained Leaves (B	9)	Other (Ex	plain in Re	marks)		FA	C-Neutral Test (D5)
Field Obser	rvations:		627.97					
Surface Wat	ter Present?	Yes N	lo <u>×</u> Depth (in	ches):		_		
Water Table	Present?	Yes N	lo <u>×</u> Depth (in	ches):	- 4			
Saturation P	Present?		lo 🔀 Depth (in				nd Hydrology	Present? Yes No X
	pillary fringe)							
Describe Re	ecorded Data (stre	eam gauge, mor	nitoring well, aerial	photos, pr	evious ins	pections), it	f available:	
Remarks:								

WETLAND DETERMINATION DATA FORM - Arid West Region Project/Site: Land of Morgan City/County: Vacaville, Solano Co Sampling Date: 9/12/2018 State: <u>CA</u> Sampling Point: ____ Applicant/Owner: William Morgan Investigator(s): B. Warzecha Section, Township, Range: T7N R1W Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): _____ Slope (%): O-S ______ Lat: ______ Datum: _____ Subregion (LRR): _____ Soil Map Unit Name: NWI classification: Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.) Are "Normal Circumstances" present? Yes X Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? 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? No _____ Is the Sampled Area Hydric Soil Present? __ No _____ within a Wetland? Wetland Hydrology Present? Yes __ No ____ Remarks: Shale willand VEGETATION - Use scientific names of plants. Absolute Dominant Indicator **Dominance Test worksheet:** Tree Stratum (Plot size: ____) % Cover Species? Status Number of Dominant Species That Are OBL, FACW, or FAC: Total Number of Dominant Species Across All Strata: Percent of Dominant Species _____ = Total Cover That Are OBL, FACW, or FAC: Sapling/Shrub Stratum (Plot size: ____) Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species _____ x 1 = ____ FACW species _____ x 2 = ____ FAC species _____ x 3 = ____ _____ = Total Cover FACU species _____ x 4 = _____ Herb Stratum (Plot size: 1 m UPL species ____ ____ x 5 = ____ 1. PESTUCA PERENNIS Column Totals: (A) _____(B) Prevalence Index = B/A = Hydrophytic Vegetation Indicators: __ Dominance Test is >50% Prevalence Index is ≤3.0¹ Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) 0 0 = Total Cover Woody Vine Stratum (Plot size: ¹Indicators of hydric soil and wetland hydrology must 1. _____ be present, unless disturbed or problematic. = Total Cover Hydrophytic Vegetation % Bare Ground in Herb Stratum % Cover of Biotic Crust Present? Remarks: All plants suresunt, grazed

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Sampling	Point:	1	

Depth	Matrix			x Feature				
inches)	Color (moist)	%	Color (moist)	%	Type'	Loc ²	<u>Texture</u>	Remarks
1/	10 NK 5/3	75	7.54R 6/5	25		M	SL	
	(i):							
	167					<u> </u>	-	
				•>>			-	
					-			
								- E
	· 							
- 0			D. 1 1 M . 1 . 0			1010-	-: 21	Name of the Part of the Manager
	Concentration, D=Dep					d Sand Gr		ation: PL=Pore Lining, M=Matrix. for Problematic Hydric Soils ³ :
•		able to all			ieu.j			
_ Histoso	Epipedon (A2)		Sandy Red Stripped M	100				luck (A9) (LRR C) luck (A10) (LRR B)
	listic (A3)		Loamy Muc		al (F1)			ed Vertic (F18)
	en Sulfide (A4)		Loamy Gle					arent Material (TF2)
	ed Layers (A5) (LRR (C)	Depleted M					Explain in Remarks)
	uck (A9) (LRR D)	3.6	Redox Darl	10000				
	ed Below Dark Surfac	e (A11)	Depleted D					
	ark Surface (A12)		Redox Dep				3Indicators	of hydrophytic vegetation and
Sandy	Mucky Mineral (S1)		Vernal Poo	ls (F9)			wetland I	hydrology must be present,
	Gleyed Matrix (S4)						unless di	sturbed or problematic.
Restrictive	Layer (if present):							
Type:								~
Depth (in	nches):						Hydric Soil	Present? Yes No
DROLO								
	drology Indicators:		dbbb	CA:			0	
Control of the Control	icators (minimum of o	ne require						dary Indicators (2 or more required)
	Water (A1)		Salt Crust					/ater Marks (B1) (Riverine)
	ater Table (A2)		Biotic Cru		(0.40)			ediment Deposits (B2) (Riverine)
	ion (A3)		Aquatic In					rift Deposits (B3) (Riverine)
- was re-life or	Marks (B1) (Nonriver		Hydrogen			95 D 123 -		rainage Patterns (B10)
	ent Deposits (B2) (No							ry-Season Water Table (C2)
	posits (B3) (Nonrive	rine)	Presence				200	rayfish Burrows (C8)
	Soil Cracks (B6)					d Soils (C6		aturation Visible on Aerial Imagery (C9
	ion Visible on Aerial I	magery (B			A CONTRACTOR OF THE PARTY OF TH			hallow Aquitard (D3)
	Stained Leaves (B9)		Other (Ex	plain in Re	emarks)		F/	AC-Neutral Test (D5)
ield Obse			w V -	escore e				
			No Depth (in					
Vater Table			No Depth (in					\times
Saturation F		es	NoX_ Depth (in	ches):		_ Wetla	and Hydrology	Present? Yes No
	ipillary fringe) ecorded Data (stream	gauge mo	onitoring well aerial	nhotos ni	revious ins	nections) i	if available:	
COOLIDO I (oorded Data (stream	gaage, me	ormorning went, aeriar	priotos, pi	CVIOUS IIIS	pections), i	ii available.	
omerk-								
Remarks:								

Project/Site: Land of Morgan City/County: Vacaville, Solano Co Sampling Date: 9/12/2018 State: <u>CA</u> Sampling Point: <u>10</u> Applicant/Owner: William Morgan Investigator(s): B. Warzecha Section, Township, Range: T7N R1W Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): ____ Slope (%): ____ Slope (%): ______ Lat: ______ Long: _____ Datum: _____ Subregion (LRR): NWI classification: Soil Map Unit Name: ___ Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.) Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes 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. Yes _____ No _____ Hydrophytic Vegetation Present? Is the Sampled Area Hydric Soil Present? Yes _____ No __X__ within a Wetland? Wetland Hydrology Present? Yes No X Remarks: VEGETATION – Use scientific names of plants. Absolute Dominant Indicator **Dominance Test worksheet:** Tree Stratum (Plot size: ____) % Cover Species? Status Number of Dominant Species That Are OBL, FACW, or FAC: Total Number of Dominant Species Across All Strata: Percent of Dominant Species _____ = Total Cover That Are OBL, FACW, or FAC: (A/B) Sapling/Shrub Stratum (Plot size: Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species _____ x 1 = ____ FACW species _____ x 2 = ____ FAC species _____ x 3 = _____ _____ = Total Cover FACU species _____ x 4 = _____ Herb Stratum (Plot size: M UPL species _____ x 5 = _____ 1. BEOMUS HORBEAGENS Column Totals: ___ _____ (A) _____ (B) 2 CENTARET COUTIT 3. THAENIATTIERUM APUT-M Prevalence Index = B/A = ____ . 10 N Hydrophytic Vegetation Indicators: __ Dominance Test is >50% Prevalence Index is ≤3.0¹ Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) 100 = Total Cover Woody Vine Stratum (Plot size: ____) ¹Indicators of hydric soil and wetland hydrology must 1.__ be present, unless disturbed or problematic. = Total Cover Hydrophytic Vegetation % Bare Ground in Herb Stratum % Cover of Biotic Crust ____ Present? Remarks:

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Sampling Point:	10

Depth	Matrix			x Features			W
(inches)	Color (moist)		Color (moist)	%Type	e ¹ Loc ²	Texture	Remarks
12	10YR 2/3	100	_			SL	
				100			
-							
S	9						¥
3-		×	193		~	-	
0	V 						v
110-							
1Type: C=C	concentration, D=Dep	lotion DM=D	adused Matrix CS	C=Covered or Co	atod Sand Cr	nine 21 nor	ation: PL=Pore Lining, M=Matrix.
	Indicators: (Applic				aleu Sanu Gi		for Problematic Hydric Soils ³ :
		able to all Li					
Histoso			Sandy Redo	1.0		12	uck (A9) (LRR C)
	pipedon (A2)		Stripped Ma				uck (A10) (LRR B)
The state of the s	listic (A3) en Sulfide (A4)			ky Mineral (F1)			d Vertic (F18)
	d Layers (A5) (LRR (*1	Depleted M	red Matrix (F2)			rent Material (TF2)
100	uck (A9) (LRR D)	•)	0	Surface (F6)		_ Other (E	Explain in Remarks)
	d Below Dark Surfac	- (Δ11)		ark Surface (F7)			
	ark Surface (A12)	(////		ressions (F8)		3Indicators of	of hydrophytic vegetation and
	Mucky Mineral (S1)		Vernal Pool				lydrology must be present,
	Gleyed Matrix (S4)		_ *************************************	0 (1 0)			sturbed or problematic.
	Layer (if present):					1	starbed of problematic.
Type:	,,,-						
Depth (in			-			Undela Call I	Descrit Vec
Remarks:	icries)					Hydric Soil F	Present? Yes No
HYDROLO	OGY						
	drology Indicators:						
	cators (minimum of o	ne required: (sheck all that apple	Λ.		Sacana	dany Indicators (2 or more required)
		ne required, t	Service residence	(0.850.859)		The state of the s	dary Indicators (2 or more required)
1	Water (A1)		Salt Crust	S			ater Marks (B1) (Riverine)
	ater Table (A2)		Biotic Crus				diment Deposits (B2) (Riverine)
Saturati		e e e e e e e e e e e e e e e e e e e	Description of the second	vertebrates (B13)	t.,,		ift Deposits (B3) (Riverine)
	Marks (B1) (Nonriver			Sulfide Odor (C1	.500		ainage Patterns (B10)
	nt Deposits (B2) (No						y-Season Water Table (C2)
	posits (B3) (Nonrive	rine)		of Reduced Iron			ayfish Burrows (C8)
	Soil Cracks (B6)			n Reduction in T	illed Soils (C6) Sa	turation Visible on Aerial Imagery (C9)
Inundati	ion Visible on Aerial I	magery (B7)	Thin Muck	Surface (C7)		Sh	allow Aquitard (D3)
	Stained Leaves (B9)		Other (Exp	lain in Remarks)		FA	C-Neutral Test (D5)
Field Obser	vations:		880				
Surface Wat	ter Present? Y	es No	Depth (inc	ches):			
Water Table			Depth (inc				
Saturation P			Depth (inc	PACE AND A SEC.		and Hydrology	Present? Yes No
	pillary fringe)					and riyarology	11050III. 105 NO
Describe Re	corded Data (stream	gauge, monit	oring well, aerial p	photos, previous	inspections), i	if available:	
		-100					*
Remarks:							

WETLAND DETERMINATION DATA FORM - Arid West Region Project/Site: Land of Morgan City/County: Vacaville, Solano Co Sampling Date: __9/12/2018 State: <u>CA</u> Sampling Point: _____ Applicant/Owner: William Morgan Section, Township, Range: T7N R1W Investigator(s): B. Warzecha Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): _____ Slope (%): _____ ______ Lat: ______ Long: _____ Datum: ____ Subregion (LRR): _____ NWI classification: ____ Soil Map Unit Name: ____ Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.) Are "Normal Circumstances" present? Yes _____ No Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? 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? __ No ____ Is the Sampled Area Hydric Soil Present? within a Wetland? Wetland Hydrology Present? Remarks: VEGETATION – Use scientific names of plants. Absolute Dominant Indicator Dominance Test worksheet: Tree Stratum (Plot size: ____) % Cover Species? Status Number of Dominant Species That Are OBL, FACW, or FAC: Total Number of Dominant Species Across All Strata: Percent of Dominant Species _____ = Total Cover That Are OBL, FACW, or FAC: Sapling/Shrub Stratum (Plot size:) Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species _____ x 1 = ____ FACW species _____ x 2 = ____ FAC species _____ x 3 = _____ _____ = Total Cover FACU species _____ x 4 = _____ Herb Stratum (Plot size: __ |m^2 UPL species ____ x 5 = ___ 1. FESTUCA PERENNIS Column Totals: _____ (A) ____ (B) PHYLA NODIFLORA Prevalence Index = B/A = Hydrophytic Vegetation Indicators: ___ Dominance Test is >50% Prevalence Index is ≤3.0¹ Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) 90 = Total Cover Problematic Hydrophytic Vegetation¹ (Explain) Woody Vine Stratum (Plot size: ____) ¹Indicators of hydric soil and wetland hydrology must 1. be present, unless disturbed or problematic. Hydrophytic = Total Cover Vegetation % Bare Ground in Herb Stratum 1 0 % Cover of Biotic Crust Present? Remarks:

	- 11	
Sampling Point:	- 11	

Depth (inches)	Matrix Color (moist)		Redo olor (moist)	%	Type ¹	Loc ²	Texture	Remarks
10_	10YR 2/3	014 7.5	YR 6/6	_6_	<u>C</u>	PL_	SL	
							-	
			_===					·
	ncentration, D=Deple					d Sand Gra		cation: PL=Pore Lining, M=Matrix.
	ndicators: (Applical	DIE TO AII LKKS			u.)			Silve Ober 1 State Control of the Co
_ Histosol (=	_ Sandy Red					Muck (A9) (LRR C)
_ Histic Epi _ Black His	pedon (A2)	-	Stripped MaLoamy Muc	City and Colored Street Services	(E1)			Muck (A10) (LRR B) ced Vertic (F18)
	Sulfide (A4)	-	Loamy Gley	전투 10명 경험 (BR) (BR) (BR) (1)	3000000			Parent Material (TF2)
	Layers (A5) (LRR C)	,	_ Depleted M		(1 2)			(Explain in Remarks)
	k (A9) (LRR D)		Redox Dark		- 6)			
	Below Dark Surface	_	_ Depleted Da					
	k Surface (A12)	-	_ Redox Depi				3Indicators	of hydrophytic vegetation and
Sandy Mi	ucky Mineral (S1)		_ Vernal Pool	s (F9)			wetland	hydrology must be present,
4111	eyed Matrix (S4)						unless o	disturbed or problematic.
estrictive L	ayer (if present):							
Туре:								V
Denth (incl								*
	nes):						Hydric Soi	I Present? Yes No
emarks:							Hydric Soi	I Present? Yes /\ No
emarks:							Hydric Soi	I Present? Yes No
emarks: DROLOC etland Hyd	SY	e required; che	ck all that appl	y)				ndary Indicators (2 or more required)
emarks: 'DROLOC etland Hyd rimary Indica	SY rology Indicators:	e required; che	ck all that appl Salt Crust	100 C 100 C 100 C			Seco	
PETAL OCT OF THE PROPERTY OF T	SY rology Indicators: ators (minimum of one	e required; che		(B11)			<u>Seco</u>	ndary Indicators (2 or more required)
emarks: 'DROLOC 'etland Hyd rimary Indica _ Surface V	GY rology Indicators: ators (minimum of one Vater (A1) er Table (A2)	e required; che	Salt Crust Biotic Crus	(B11)	(B13)		Secon V	ndary Indicators (2 or more required) Vater Marks (B1) (Riverine)
PROLOC Vetland Hyd rimary Indica Surface V High Wat Saturation	GY rology Indicators: ators (minimum of one Vater (A1) er Table (A2)		Salt Crust Biotic Crus	(B11) st (B12) vertebrates	- Transmitted		<u>Seco</u> V S	ndary Indicators (2 or more required) Vater Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine)
PROLOC Petland Hyd rimary Indica Surface V High Wat Saturation Water Ma	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) n (A3)	e)	Salt Crust Biotic Crus Aquatic Inv	(B11) st (B12) vertebrates Sulfide Odd	or (C1)	Living Root	Seco V S C	ndary Indicators (2 or more required) Vater Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Orift Deposits (B3) (Riverine)
PROLOC Vetland Hyd rimary Indica Surface V High Wat Saturation Water Ma	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) n (A3) irks (B1) (Nonriverin	e) iverine)	Salt Crust Biotic Crust Aquatic In Hydrogen	(B11) st (B12) vertebrates Sulfide Odo Rhizosphere	or (C1) es along		Seco V S C C	ndary Indicators (2 or more required) Vater Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Orift Deposits (B3) (Riverine) Orainage Patterns (B10)
/DROLOC /etland Hyd rimary Indica _ Surface V _ High Wat _ Saturation _ Water Ma _ Sediment _ Drift Depo	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) n (A3) arks (B1) (Nonriverin Deposits (B2) (Nonr	e) iverine) ne)	Salt Crust Biotic Crust Aquatic In Hydrogen Oxidized F	(B11) st (B12) vertebrates Sulfide Odd Rhizosphere of Reduced	or (C1) es along d Iron (C4	1)	<u>Seco</u> V S C C	ndary Indicators (2 or more required) Vater Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Orift Deposits (B3) (Riverine) Orainage Patterns (B10) Ory-Season Water Table (C2)
/DROLOC /etland Hyd rimary Indica _ Surface V _ High Wat _ Saturation _ Water Ma _ Sediment _ Drift Depo _ Surface S	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) n (A3) urks (B1) (Nonriverin Deposits (B2) (Nonriverin osits (B3) (Nonriverin	e) iverine) ne)	Salt Crust Biotic Crust Aquatic Int Hydrogen Oxidized F Presence	(B11) st (B12) vertebrates Sulfide Odd Rhizosphere of Reduced n Reductio	or (C1) es along d Iron (C4 n in Tilled	1)	Seco V S C C ts (C3) C	ndary Indicators (2 or more required) Vater Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Orift Deposits (B3) (Riverine) Orainage Patterns (B10) Ory-Season Water Table (C2) Crayfish Burrows (C8)
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WETLAND DETERMINATION DATA FORM - Arid West Region City/County: Vacaville, Solano Co Sampling Date: 9/32/2018 Project/Site: Land of Morgan State: <u>CA</u> Sampling Point: ____ Applicant/Owner: William Morgan Investigator(s): B. Warzecha Section, Township, Range: T7N R1W Lat: Long: Datum: Subregion (LRR): NWI classification: ___ Soil Map Unit Name: _____ Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.) Are "Normal Circumstances" present? Yes _____ No _____ Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? 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 Hydric Soil Present? Yes No within a Wetland? Wetland Hydrology Present? Yes ____ No _ Remarks: VEGETATION – Use scientific names of plants. Absolute Dominant Indicator **Dominance Test worksheet:** Tree Stratum (Plot size: _____) % Cover Species? Status Number of Dominant Species That Are OBL, FACW, or FAC: Total Number of Dominant Species Across All Strata: Percent of Dominant Species _____ = Total Cover That Are OBL, FACW, or FAC: Sapling/Shrub Stratum (Plot size:) Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = ____ FAC species _____ x 3 = _____ = Total Cover FACU species _____ x 4 = _____ Herb Stratum (Plot size: _ ____ x 5 = __ UPL species ___ BROWNS HORDEN Column Totals: (A) _____(B) AVENIA CD 3. CENTAUNEA SOUPPITAK Prevalence Index = B/A = ____ 4. CARDUS PY(NOCEPHANIC Hydrophytic Vegetation Indicators: __ Dominance Test is >50% Prevalence Index is ≤3.01 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) 1 0 0 = Total Cover Woody Vine Stratum (Plot size: ____) ¹Indicators of hydric soil and wetland hydrology must 1. ___ be present, unless disturbed or problematic. Hydrophytic = Total Cover Vegetation % Bare Ground in Herb Stratum ____ % Cover of Biotic Crust Present? Remarks:

_	_	_	
c	\sim	81	
o	v	ш	_

	19	
Sampling Point	16	

Depth	Matrix		Redox Featu		
(inches)	Color (moist)		olor (moist) %	Type ¹ Loc ²	Texture Remarks
10	10YR 2/3	100			26
					
-					· · · · · · · · · · · · · · · · · · ·
				100	
¹ Type: C=C	oncentration, D=Depl	etion, RM=Redu	iced Matrix, CS=Cove	red or Coated Sand G	rains. ² Location: PL=Pore Lining, M=Matrix.
Hydric Soil	Indicators: (Applica	able to all LRRs	, unless otherwise n	oted.)	Indicators for Problematic Hydric Soils ³ :
Histosol	(A1)	4	Sandy Redox (S5)		1 cm Muck (A9) (LRR C)
Histic E	pipedon (A2)	32	Stripped Matrix (S6	6)	2 cm Muck (A10) (LRR B)
Black H	stic (A3)		_ Loamy Mucky Mine		Reduced Vertic (F18)
	en Sulfide (A4)	_	_ Loamy Gleyed Mat		Red Parent Material (TF2)
	Layers (A5) (LRR C	-	Depleted Matrix (F:		Other (Explain in Remarks)
	ick (A9) (LRR D)	'	Redox Dark Surface		one (Explain in Centario)
	d Below Dark Surface	(A11)	_ Depleted Dark Surf		
	ark Surface (A12)		_ Redox Depressions		³ Indicators of hydrophytic vegetation and
	fucky Mineral (S1)	_	Vernal Pools (F9)	o (1 o)	wetland hydrology must be present,
	Gleyed Matrix (S4)	·	_ vernar r dois (r d)		unless disturbed or problematic.
The same of the sa	Layer (if present):				unless disturbed of problematic.
	Layer (ii present).				
Type:	10 Total				×
Depth (in Remarks:	ches):				Hydric Soil Present? Yes No
224452000000000000000000000000000000000	ches):				Hydric Soil Present? Yes No
Remarks:					Hydric Soil Present? Yes No
Remarks:	GY				Hydric Soil Present? Yes No
Remarks: HYDROLO Wetland Hy	GY drology Indicators:	ne required; chec	ck all that anniv)		
Remarks: HYDROLO Wetland Hy Primary India	GY drology Indicators: cators (minimum of o	ne required; chec	A SEPTEMBER OF THE PROPERTY OF		Secondary Indicators (2 or more required)
HYDROLO Wetland Hy Primary India Surface	GY drology Indicators: cators (minimum of or Water (A1)	ne required; chec	Salt Crust (B11)		Secondary Indicators (2 or more required) Water Marks (B1) (Riverine)
HYDROLO Wetland Hy Primary India Surface High Wa	GY drology Indicators: cators (minimum of or Water (A1) tter Table (A2)	ne required; chec	Salt Crust (B11) Biotic Crust (B12)		Secondary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine)
HYDROLO Wetland Hy Primary India Surface High Wa Saturatia	GY drology Indicators: cators (minimum of or Water (A1) ter Table (A2) on (A3)		Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra	ates (B13)	Secondary Indicators (2 or more required) Water Marks (B1) (Riverine)
HYDROLO Wetland Hy Primary India Surface High Wa Saturatia	GY drology Indicators: cators (minimum of or Water (A1) tter Table (A2)		Salt Crust (B11) Biotic Crust (B12)	ates (B13)	Secondary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine)
HYDROLO Wetland Hy Primary India Surface High Wa Saturati Water M	GY drology Indicators: cators (minimum of or Water (A1) ter Table (A2) on (A3)	- ne)	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide	ates (B13) Odor (C1)	Secondary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Drift Deposits (B3) (Riverine)
HYDROLO Wetland Hy Primary India Surface High Wa Saturati Water W Sedimel	GY drology Indicators: cators (minimum of or Water (A1) ster Table (A2) on (A3) larks (B1) (Nonriveri	ne) _	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide	ates (B13) Odor (C1) heres along Living Roo	Secondary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Drift Deposits (B3) (Riverine) Drainage Patterns (B10)
HYDROLO Wetland Hy Primary India Surface High Wa Saturatia Water M Sedimer Drift Der	GY drology Indicators: cators (minimum of or Water (A1) ster Table (A2) on (A3) larks (B1) (Nonriveri at Deposits (B2) (Nor posits (B3) (Nonriver)	ne) iniverine) ine)	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide Oxidized Rhizospl Presence of Redu	ates (B13) Odor (C1) heres along Living Roc iced Iron (C4)	Secondary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Drift Deposits (B3) (Riverine) Drainage Patterns (B10) ots (C3) Dry-Season Water Table (C2) Crayfish Burrows (C8)
HYDROLO Wetland Hy Primary India Surface High Wa Saturati Water M Sedimer Drift Der	GY drology Indicators: cators (minimum of or Water (A1) hter Table (A2) on (A3) larks (B1) (Nonriveri ant Deposits (B2) (Nor loosits (B3) (Nonriver Soil Cracks (B6)	ne) _ ine) _	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide Oxidized Rhizospl Presence of Redu Recent Iron Redu	ates (B13) Odor (C1) heres along Living Roc aced Iron (C4) ction in Tilled Soils (C6	Secondary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Drift Deposits (B3) (Riverine) Drainage Patterns (B10) ots (C3) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9)
HYDROLO Wetland Hy Primary India Surface High Wa Saturati Water M Sedimer Drift Dep Surface Inundati	GY drology Indicators: cators (minimum of or Water (A1) hter Table (A2) on (A3) larks (B1) (Nonriveri ht Deposits (B2) (Nor cosits (B3) (Nonriver Soil Cracks (B6) on Visible on Aerial In	ne) _ ine) _	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide Oxidized Rhizospi Presence of Redu Recent Iron Redu Thin Muck Surface	ates (B13) Odor (C1) heres along Living Roc nced Iron (C4) ction in Tilled Soils (C6) e (C7)	Secondary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Drift Deposits (B3) (Riverine) Drainage Patterns (B10) Ots (C3) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Shallow Aquitard (D3)
HYDROLO Wetland Hy Primary India Surface High Wa Saturati Water M Sedimer Drift Dep Surface Inundati Water-S	drology Indicators: cators (minimum of or Water (A1) ter Table (A2) on (A3) larks (B1) (Nonriveri at Deposits (B2) (Nor cosits (B3) (Nonriver Soil Cracks (B6) on Visible on Aerial In tained Leaves (B9)	ne) _ ine) _	Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide Oxidized Rhizospl Presence of Redu Recent Iron Redu	ates (B13) Odor (C1) heres along Living Roc nced Iron (C4) ction in Tilled Soils (C6) e (C7)	Secondary Indicators (2 or more required) Water Marks (B1) (Riverine) Sediment Deposits (B2) (Riverine) Drift Deposits (B3) (Riverine) Drainage Patterns (B10) ots (C3) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9)
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