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## **Delineation of Waters of the United States**

**Ryan Avenue Project**  
Chico, Butte County, CA

**October 2012**



*Prepared for:*

George Santos  
634 West 4<sup>th</sup> Avenue  
Chico, CA 95926

*Prepared by:*



**NorthStar**  
**ENVIRONMENTAL**  
Formerly Gateway Consulting

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# **DRAFT**

## **DELINEATION OF WATERS OF THE UNITED STATES**

**Ryan Avenue Project**  
Chico, Butte County, CA.

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### **Introduction and Project Location**

NorthStar Environmental (NorthStar) conducted a delineation of waters of the U.S. for an approximately 6-acre project area located in Chico, Butte County, California (**Figure 1**). The Ryan Avenue Project (Project) is located in Section 34, Township 23N, Range 1E, of the Richardson Springs U.S. Geological Survey (USGS) 7.5 minute quadrangle map. A survey was conducted on October 1, 2012 by biologist Andrew Anderson and botanist Elena Gregg within the Project site and the land adjacent to Cohasset Road (Survey Area). The survey involved an examination of botanical resources, soils, hydrological features, and determination of wetland characteristics based on the *United States Army Corps of Engineers Wetlands Delineation Manual* (1987); the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (2008); and the *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* (2007).

Proposed on the site is the fill of the northwest corner of the property, the use of the eastern-most portion of the site as a materials storage area, the installation of two temporary buildings and a storm drain line, and the potential future construction of a mini storage area in the portion of the site adjacent to Ryan Avenue.

This report addresses the nature, jurisdictional status, and landscape position of the wetlands in the survey area; it does not provide information suitable for structural analysis of soils for construction purposes, flood plain delineation, or other purposes not expressly stated. Wetland acreages presented in this report should be considered preliminary, and subject to review and modification by the U.S. Army Corps of Engineers (USACE) during the wetland delineation verification process.

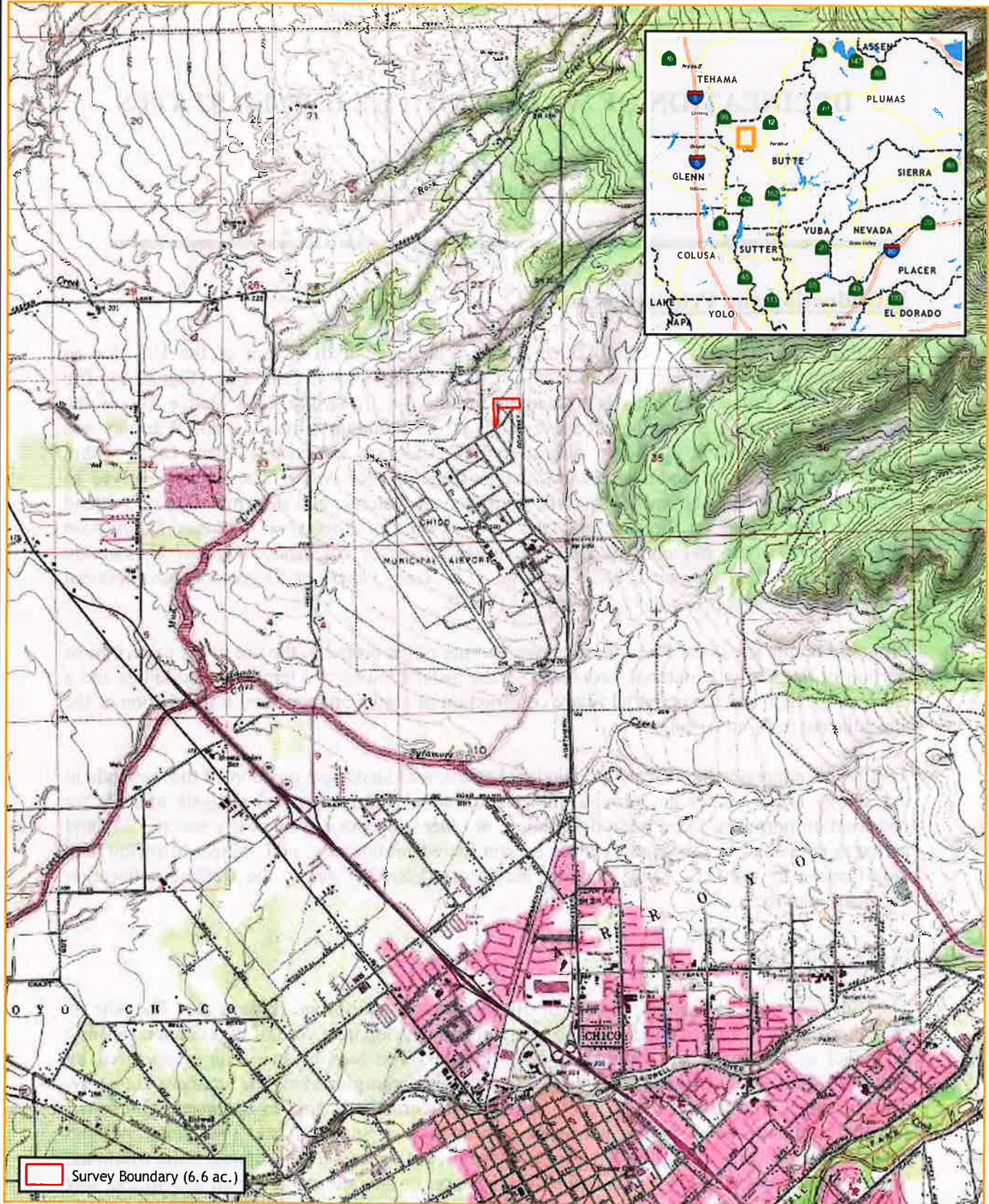
### **Site Conditions**

The Survey Area is located in Chico, Butte County, California (**Figure 1**). The site is characterized by disturbed annual grassland and urban development void of vegetation consisting of gravel access roads and equipment parking areas. The Survey Area site is bordered by Cohasset Road along the eastern boundary, a commercial complex along the southern boundary, disturbed annual grassland to the west, and a local recreational area to the north. One small seasonal wetland occurs in the northwest portion of the Survey Area. This small wetland contains plant species indicative of seasonal wetlands, but appears to be isolated. Soils within the Survey Area include sandy loams and clay. Elevation on the site ranges from 273 to 292 feet above sea level. Weather documented in the Chico area ranges from an average of 75.2 degrees



# Ryan Avenue Project

## Location



Within Section 34 of  
T23N, R1E Butte County, CA.  
Richardson Springs USGS 7.5' Quad  
Map Date: October 3, 2012

Miles  
0 0.5 1



Figure 1



Fahrenheit in the summer to 46.8 degrees Fahrenheit in the winter with average precipitation totaling 25.66 inches annually (WRCC 2012).

## **Survey Methodology**

Many of the terms used throughout this report have specific meanings relating to the federal wetland delineation process. Term definitions are based on the *USACE Wetlands Delineation Manual* (1987); the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (1989); the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region* (2008); and, the *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* (2007). The terms defined below have specific meaning relating to the delineation of waters of the U.S. as prescribed by §404 of the Clean Water Act (CWA).

### *Terminology*

**Abutting:** When referring to wetlands that are adjacent to a tributary, abutting defines those wetlands that are not separated from the tributary by an upland feature, such as a berm or dike.

**Adjacent:** Adjacent as used in “Adjacent to a traditional navigable water,” is defined in USACE and Environmental Protection Agency (EPA) regulations as “bordering, contiguous, or neighboring.” Wetlands separated from other waters of the U.S. by man-made dikes or barriers, natural river berms, beach dunes and the like are ‘adjacent wetlands.’

**Atypical situation (significantly disturbed):** In an atypical (significantly disturbed) situation, recent human activities or natural events have created conditions where positive indicators for hydrophytic vegetation, hydric soil, or wetland hydrology are not present or observable.

**Ephemeral stream:** An ephemeral stream has flowing water only during and for a short duration after, precipitation events in a typical year. Ephemeral streambeds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

**Growing season:** The growing season is the portion of the year when soil temperatures at 19.7 inches below the soil surface are above biologic zero (41° F) as defined by soil taxonomy.

**Hydric soil:** Soil is hydric that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic (oxygen-depleted) conditions in its upper part (*i.e.* within the shallow rooting zone of herbaceous plants).

**Intermittent stream:** An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

**Jurisdictional wetland:** Sites that meet the definition of wetland provided below and that fall under USACE regulations pursuant to §404 of the CWA are considered jurisdictional wetlands.

**Man-induced wetlands:** A man-induced wetland is an area that has developed at least some characteristics of naturally occurring wetlands due to either intentional or incidental human activities.

**Non-relatively permanent waters:** This describes a body of water such as an ephemeral stream, which has flowing water only during and for a short period of time following precipitation events in a typical year. Non-relatively permanent waters (NRPWs) are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

**Normal circumstances:** This term refers to the soil and hydrologic conditions that are normally present, without regard to whether the vegetation has been removed.

**Other waters of the United States:** Other waters of the U.S. are seasonal or perennial water bodies, including lakes, stream channels, drainages, ponds, and other surface water features, that exhibit an ordinary high-water mark but lack positive indicators for one or more of the three wetland parameters (hydrophytic vegetation, hydric soil, and wetland hydrology) (33 CFR 328.4).

**Perennial stream:** A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

**Plant indicator status categories:**

*Obligate wetland plants (OBL)* – plants that occur almost always (estimated probability 99%) in wetlands under normal conditions, but which may also occur rarely (estimated probability 1%) in non-wetlands.

*Facultative wetland plants (FACW)* - plants that usually occur (estimated probability 67% to 99%) in wetlands under normal conditions, but also occur (estimated probability 1% to 33%) in non-wetlands.

*Facultative plants (FAC)* – Plants with a similar likelihood (estimated probability 33% to 67%) of occurring in both wetlands and non-wetlands.

*Facultative upland plants (FACU)* – Plants that occur sometimes (estimated probability 1% to 33%) occur in wetlands, but occur more often (estimated probability 67% to 99%) in non-wetlands.

*Obligate upland plants (UPL)* – Plants that occur rarely (estimated probability 1%) in wetlands, but occur almost always (estimated probability 99%) in non-wetlands under natural conditions.



**Ponded:** Ponding is a condition in which free water covers the soil surface (e.g., in a closed depression) and is removed only by percolation, evaporation, or transpiration.

**Problem area:** Problem areas are those where one or more wetland parameters may be lacking because of normal seasonal or annual variations in environmental conditions that result from causes other than human activities or catastrophic natural events.

**Relatively permanent:** As defined in the *Rapanos* guidance document, a water body is “relatively permanent” if its flow is year round or its flow is continuous at least “seasonally,” (e.g., typically 3 months). Wetlands adjacent to a “relatively permanent” tributary are also jurisdictional if those wetlands directly abut such a tributary.

**Significant nexus:** A water body is considered to have a “significant nexus” with a traditional navigable water if its flow characteristics and functions in combination with the ecologic and hydrologic functions performed by all wetlands adjacent to such a tributary, affect the chemical, physical, and biological integrity of a downstream traditional navigable water.

**Traditional navigable water:** Includes all of the “navigable water of the United States,” defined in 33 C.F.R. § 329, and by numerous decisions of the Federal courts, plus all other waters that are navigable-in-fact. As defined in 33 C.F.R. § 329, “Navigable waters of the United States are those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the water body, and is not extinguished by later actions or events which impede or destroy navigable capacity.”

**Tributary:** As defined in the *Rapanos* guidance document a tributary is a natural, man-altered, or man-made water body that carries flow directly or indirectly into traditional navigable waters. For purposes of determining “significant nexus” with a traditional navigable water, a “tributary” is the entire reach of the stream that is of the same order (i.e., from the point of confluence, where two lower order streams meet to form the tributary, downstream to the point where such tributary enters a higher order stream).

**Waters of the United States:** This is the encompassing term for areas under federal jurisdiction pursuant to § 404 of the CWA. Waters of the U.S. are divided into “wetlands” and “other waters of the U.S.”

**Wetland:** Wetlands are defined as “areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR 328.3 [b], 40 CFR 230.3). To be considered under federal jurisdiction, a wetland must support positive indicators for hydrophytic vegetation, hydric soil, and wetland hydrology.

### *Determination of Hydrophytic Vegetation*

The presence of hydrophytic vegetation was determined using the methods outlined in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (1989) and the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region* (2008), which are approved by the USACE for use in conjunction with the *Wetlands Delineation Manual* (1987). Areas are considered to have positive indicators of hydrophytic vegetation if they pass the dominance test, meaning more than 50 percent of the dominant species are OBL, FACW, FAC (Reed 1988). Plant species were identified to the lowest taxonomy possible.

### *Determination of Hydric Soils*

Soil survey information was reviewed for the Survey Area and the Natural Resources Conservation Service (NRCS) database was consulted on the local soil conditions. The use of hydric soil indicators, as outlined in the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region* (2008), was applied to all soil samples. Official soil series descriptions are provided in **Appendix A** and the distribution of soil map units for the site is shown in **Figure 2**.

### *Determination of Wetland Hydrology*

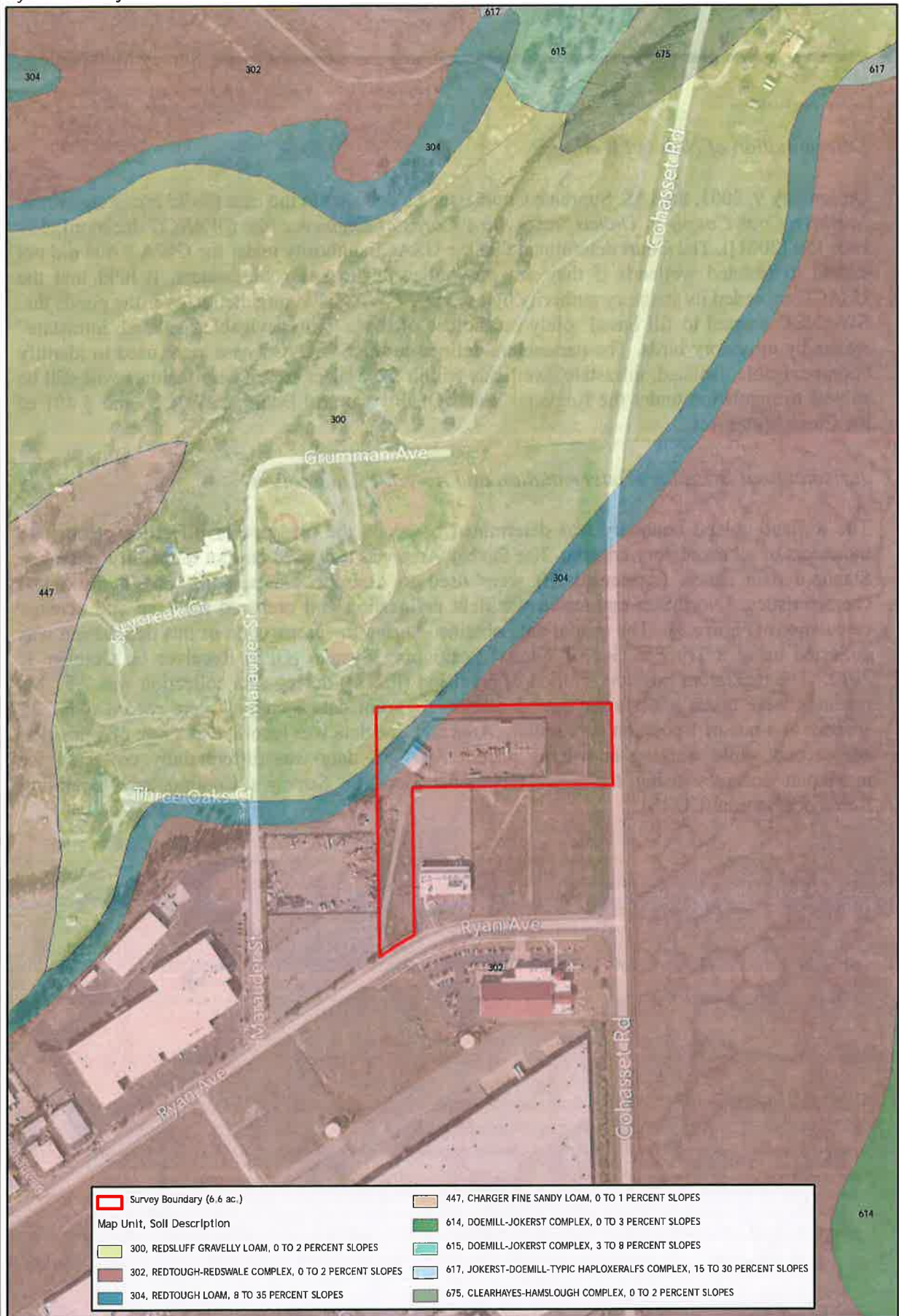
Wetland hydrology was determined to be present if a site supported one or more of the following characteristics:

- Landscape position and surface topography (e.g. position of the site relative to an up-slope water source, location within a distinct wetland drainage pattern, and concave surface topography);
- Inundation or saturation for a long duration either inferred based on field indicators or observed during repeated site visits; and
- Residual evidence of ponding or flooding resulting in field indicators such as scour marks, sediment deposits, algal matting, and drift lines.

The presence of water or saturated soil for approximately 5 to 12.5 percent of the growing season typically creates anaerobic conditions in the soil, and these conditions affect the types of plants that can grow and the types of soils that develop (Environmental Laboratory 1987).

### *Determination of Ordinary High Water Mark*

The lateral extent of non-tidal water bodies (e.g. intermittent streams) were based on the ordinary high water mark (OHWM), which is “the line on the shore established by the fluctuations of water” (USACE 2005). The OHWM was determined based on physical characteristics of the area, including scour, multiple observed flow events (from current and historical aerial photos), shelving, changes in the character of soil, presence of mature vegetation, deposition, and topography. Due to the wide extent of some floodplains, adjacent riparian areas characterized by hydric soils, hydrophytic vegetation, and hydrology may be included within the OHWM of a non-tidal water body.



Soils classification provided by NRCS  
Imagery date: 2/2012 (Bing Maps)  
Map Date: 10/3/2012

1 inch = 300 feet  
Feet  
0 300 600



**NorthStar**  
ENVIRONMENTAL  
SUSTAINABLE SOLUTIONS

Figure 2

### *Determination of Isolated Wetlands*

On January 9, 2001, the U.S. Supreme Court issued a decision in the case (*Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers* [the *SWANCC* decision], 531 U.S. 159 [2001]). The Court determined that the USACE authority under the CWA § 404 did not extend to isolated wetlands if they are not “adjacent” to navigable waters. It held that the USACE exceeded its statutory authority by asserting CWA § 404 jurisdiction over the ponds that SWANCC wanted to fill based solely on the use of those “non-navigable, isolated, intrastate” waters by migratory birds. The parameters defined in the SWANCC case were used to identify “non-navigable, isolated, intrastate” wetlands within the project area. These features will still be subject to regulation under the Regional Water Quality Control Board (RWQCB) and § 401 of the Clean Water Act.

### *Jurisdictional Boundary Determination and Acreage Calculation*

The wetland-upland boundary was determined based on the presence or inference of positive indicators of all mandatory criteria. The Survey Area was traversed on foot to identify wetlands. Standard data sheets (**Appendix B**) were used to describe plants, soils, and hydrological characteristics. NorthStar conducted the field delineation and prepared the map and acreage calculations (**Figure 3**). The spatial data obtained during the preparation of this delineation was collected using a Trimble GeoXT Global Positioning System (GPS) Receiver on October 1, 2012. The maximum position dilution of precision (PDOP) during data collection was 7.5. No readings were taken with fewer than 5 satellites. Point data locations were recorded for 25 seconds at a rate of 1 position per second. Area and line data was recorded at a rate of 1 position per second while walking at a slow pace. All GPS data was differentially corrected for maximum accuracy using the nearest National Geodetic Survey’s Continuously Operating Reference Station (CORS).





All features to remain preliminary until written verification from USACE.  
 Survey date: 10/1/2012 (EG)  
 Imagery date: 2/2012 (Bing Maps)  
 Map Date: 10/3/2012

1 inch = 100 feet  
 Feet  
 0 100 200



Figure 3



## **Results**

A total of 0.03 acre of potentially non-jurisdictional wetlands were delineated within the Survey Area. The one wetland identified on-site is distinguished as a seasonal wetland (**Table 1**). This feature is mapped at a 1" to 200' scale and is presented in **Figure 3**. Wetland acreages presented in this report should be considered preliminary, subject to review and modification by the USACE during the wetland delineation verification process. The wetlands, and the data of interpretation used to delineate their jurisdictional boundaries are described above.

**Table 1.** Wetland totals delineated within the Ryan Avenue Project Survey Area.

<b>Wetland Features</b>						
Type	Adjacency	Label	Avg. Width (ft.)	Length (ft.)	Area (ft. <sup>2</sup> )	Acres
Seasonal Wetland	Isolated	NJW01	n/a	n/a	1326.722	0.030
Non-jurisdictional Wetland Total =				n/a	1326.722	0.030
Total of All NJW =				n/a	1326.722	0.030

### *Jurisdictional Features*

No jurisdictional wetlands or other waters of the U.S. were identified within the Survey Area.

### *Potentially Non-Jurisdictional Features*

One potentially non-jurisdictional feature was observed within the Survey Area. This potentially non-jurisdictional wetland (NJW) is classified as a seasonal wetland. Seasonal wetlands are defined by the positive indication of three wetland parameters: hydrophytic vegetation, hydric soils, and hydrology (*i.e.*, ponding). All three parameters must be present to satisfy the wetland definition, which was applied while delineating all seasonal wetlands present on-site. These features allow water to pond for a long enough period of time to support hydrophytic vegetation and hydric soils. Seasonal wetlands tend to lack standing water during the late summer months, or during prolonged dry periods. They support hydrophytic plant species, such as *Eleocharis* that require longer and typically deeper inundation periods than those species occurring in vernal pools. The Survey Area supports 0.03 acre of potentially non-jurisdictional seasonal wetlands. The wetland is potentially non-jurisdictional since the feature is isolated. All hydrologic connection to this wetland is cut off by a large fill pile present, and the remaining upland habitat is higher in elevation than the area in which the wetland has formed. The water that collects within the wetland is quickly absorbed into the moderately well draining soil and the remaining ponded water gradually evaporates. The water is not directed into the adjacent drainage.

### *Significant Nexus*

A jurisdictional determination and significant nexus determination will be required per the *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* (May 30, 2007) and the *Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision*

*Rapanos v. United States and Carabell v. United States* for the one seasonal wetland within the Survey Area. This seasonal wetland is located within hydric soils and lowland topography typical of wetlands and has all three wetland parameters. However, this wetland is isolated and does not have a significant effect on the chemical, physical, and biological integrity of down gradient drainages. The wetland within the Survey Area intercepts sheet flow from uplands and collects and holds water during significant rain events, but water that collects in the wetland is cut off from the nearby drainage to the north of the Survey Area, Mud Creek, by a large fill pile. Furthermore, the wetland is man-made since the wetland would not exist if the fill pile present did not force the water to unnaturally pond.

### *Soils*

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) 2006 *Soil Survey of Butte Area, California Parts of Butte and Plumas Counties* identified three soil map units within the Survey Area including the Redsluff gravelly loam, 0-2 percent slopes, Redtough loam, 8-35 percent slopes, and the Redtough-Redswale complex, 0-2 percent slopes map unit (**Appendix A**). The majority of the Survey Area is composed of the Redtough-Redswale complex map unit, with the two other soil map units only occurring within the northwestern portion of the Survey Area (**Figure 2**). Soil series descriptions are presented in **Appendix A** and wetland data sheets are presented in **Appendix B**.

When pooled water and/or obligate plants were present, hydric soils were assumed. In areas with questionable upland/wetland distinction, soil pit samples were observed to determine the presence or absence of hydric soil indicators. Pooled water was not observed within the wetland on-site during the field visit.

### *Vegetation*

The vegetation within the Survey Area is characterized by weedy annual grass and forb plant species. The upland areas consist of urbanized land, graded land void of vegetation, and previously disturbed areas that have been colonized by weedy annual plants. Some of the dominant weedy plants observed within the upland areas included medusahead, prickly lettuce, soft chess, wild oats, filaree, yellow star thistle, and ryegrass. One seasonal wetland occurs within the northwestern portion of the Survey Area and continues off-site to the west. Within this one seasonal wetland, the dominant plant species included Mediterranean barley, loosestrife, ryegrass, bindweed, and curly dock. The lowest point of the wetland did contain some pale spikerush, but this area occurred in the off-site portion of the wetland.

### *Hydrology*

The hydrology within the Survey Area is characterized by localized runoff from precipitation events. However, within the northwestern portion of the Survey Area, additional water inputs occur when the adjacent Cal Water well is pumped to clear the lines of bacteria. This is conducted on an as needed basis but is typically done during the summer months. To the north of the Survey Area is Mud Creek, which does not typically have water present. Historically, the runoff from the Survey Area would sheet flow into this drainage, however, a large pile of fill has

been placed on the adjacent property which has cut off the natural sheet flow which would typically occur and has caused the runoff from the Survey Area and adjacent properties to pool at the base of this large fill pile, creating the one isolated seasonal wetland within the Survey Area. Furthermore, the water collected within the wetland does not drain around the fill pile since the surrounding upland areas are higher in elevation than the wetland area.

Copies of field data sheets are provided in **Appendix B**.

## Site Photos



Fill pile with NJW 01 occurring at its toe, looking northeast

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## Appendix A. Official Soils Series Descriptions

## Butte Area, California, Parts of Butte and Plumas Counties

### 300—REDSLUFF GRAVELLY LOAM, 0 TO 2 PERCENT SLOPES

#### Map Unit Setting

*Elevation:* 180 to 400 feet

*Mean annual precipitation:* 24 to 29 inches

*Mean annual air temperature:* 61 to 63 degrees F

*Frost-free period:* 250 to 255 days

#### Map Unit Composition

*Redsluff, gravelly loam, and similar soils:* 80 percent

*Minor components:* 20 percent

#### Description of Redsluff, Gravelly Loam

##### Setting

*Landform:* Fan terraces

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Fine-loamy alluvium derived from igneous, metamorphic and sedimentary rock over gravelly alluvium derived from volcanic rock

##### Properties and qualities

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Moderately well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.28 to 0.99 in/hr)

*Depth to water table:* About 35 to 80 inches

*Frequency of flooding:* Rare

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 0.5 mmhos/cm)

*Available water capacity:* Low (about 5.5 inches)

##### Interpretive groups

*Land capability classification (irrigated):* 2s

*Land capability (nonirrigated):* 3s

##### Typical profile

*0 to 2 inches:* Gravelly loam

*2 to 5 inches:* Gravelly loam

*5 to 12 inches:* Gravelly clay loam

*12 to 21 inches:* Gravelly loam

*21 to 29 inches:* Gravelly loam

*29 to 37 inches:* Gravelly loam

*37 to 42 inches:* Extremely gravelly sandy loam

*42 to 80 inches:* Extremely gravelly loamy sand

### **Minor Components**

#### **Unnamed, weak cementation below 40 inches**

*Percent of map unit: 4 percent*

*Landform: Fan terraces*

#### **Fernandez, sandy loam**

*Percent of map unit: 4 percent*

*Landform: Fan terraces*

#### **Anita, gravelly duripan**

*Percent of map unit: 3 percent*

*Landform: Fan terraces*

#### **Typic haploxeralfs, very deep**

*Percent of map unit: 3 percent*

*Landform: Fan terraces*

#### **Redtough**

*Percent of map unit: 2 percent*

*Landform: Fan terraces*

#### **Pachic argixerolls**

*Percent of map unit: 2 percent*

*Landform: Fan terraces*

#### **Munjar**

*Percent of map unit: 2 percent*

*Landform: Fan terraces*

## **Data Source Information**

Soil Survey Area: Butte Area, California, Parts of Butte and Plumas Counties

Survey Area Data: Version 9, Jun 2, 2009

## Butte Area, California, Parts of Butte and Plumas Counties

### 304—REDTOUGH LOAM, 8 TO 35 PERCENT SLOPES

#### Map Unit Setting

*Elevation:* 200 to 300 feet

*Mean annual precipitation:* 23 to 28 inches

*Mean annual air temperature:* 61 to 63 degrees F

*Frost-free period:* 255 days

#### Map Unit Composition

*Redtough, loam, and similar soils:* 80 percent

*Minor components:* 20 percent

#### Description of Redtough, Loam

##### Setting

*Landform:* Fan terraces

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Parent material:* Loamy alluvium over cemented cobbly and gravelly  
alluvium derived from volcanic rock

##### Properties and qualities

*Slope:* 8 to 35 percent

*Depth to restrictive feature:* 10 to 20 inches to duripan

*Drainage class:* Somewhat poorly drained

*Capacity of the most limiting layer to transmit water (Ksat):* Very low  
(0.00 to 0.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water capacity:* Very low (about 1.6 inches)

##### Interpretive groups

*Land capability classification (irrigated):* 7s

*Land capability (nonirrigated):* 7s

##### Typical profile

*0 to 1 inches:* Loam

*1 to 7 inches:* Gravelly loam

*7 to 13 inches:* Very cobbly loam

*13 to* Cemented very gravelly material

#### Minor Components

##### Unnamed, duripan 20 to 40 inches

*Percent of map unit:* 10 percent

*Landform:* Fan terraces



**Redswale**

*Percent of map unit: 8 percent*

*Landform: Fan terraces*

**Unnamed, duripan outcrop**

*Percent of map unit: 2 percent*

*Landform: Fan terraces*

## **Data Source Information**

Soil Survey Area: Butte Area, California, Parts of Butte and Plumas Counties

Survey Area Data: Version 9, Jun 2, 2009

## Butte Area, California, Parts of Butte and Plumas Counties

### 302—REDTOUGH-REDSWALE COMPLEX, 0 TO 2 PERCENT SLOPES

#### Map Unit Setting

*Elevation:* 200 to 400 feet

*Mean annual precipitation:* 23 to 28 inches

*Mean annual air temperature:* 61 to 63 degrees F

*Frost-free period:* 250 to 255 days

#### Map Unit Composition

*Redtough, loam, and similar soils:* 50 percent

*Redswale, cobbly loam, and similar soils:* 35 percent

*Minor components:* 15 percent

#### Description of Redtough, Loam

##### Setting

*Landform:* Fan terraces

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Tread

*Microfeatures of landform position:* Mounds

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Parent material:* Loamy alluvium over cemented cobbly and gravelly  
alluvium derived from volcanic rock

##### Properties and qualities

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* 10 to 20 inches to duripan

*Drainage class:* Somewhat poorly drained

*Capacity of the most limiting layer to transmit water (Ksat):* Very low  
(0.00 to 0.00 in/hr)

*Depth to water table:* About 2 to 20 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water capacity:* Very low (about 1.6 inches)

##### Interpretive groups

*Land capability classification (irrigated):* 7s

*Land capability (nonirrigated):* 7s

*Other vegetative classification:* CLAYEY TERRACE (null\_3)

##### Typical profile

*0 to 1 inches:* Loam

*1 to 7 inches:* Gravelly loam

*7 to 13 inches:* Very cobbly loam

*13 to* Cemented very gravelly material

## **Description of Redswale, Cobbly Loam**

### **Setting**

*Landform:* Fan terraces  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Tread  
*Microfeatures of landform position:* Swales  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Parent material:* Cobbly and loamy alluvium over cemented cobbly and gravelly alluvium derived from volcanic rock

### **Properties and qualities**

*Slope:* 0 to 3 percent  
*Surface area covered with cobbles, stones or boulders:* 0.0 percent  
*Depth to restrictive feature:* 4 to 10 inches to duripan  
*Drainage class:* Poorly drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)  
*Depth to water table:* About 0 to 10 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Available water capacity:* Very low (about 0.7 inches)

### **Interpretive groups**

*Land capability classification (irrigated):* 8  
*Land capability (nonirrigated):* 8  
*Other vegetative classification:* CLAYEY TERRACE (null\_3)

### **Typical profile**

*0 to 1 inches:* Cobbly loam  
*1 to 7 inches:* Very cobbly loam  
*7 to* Cemented very gravelly material

## **Minor Components**

### **Redswale, frequent long flooding**

*Percent of map unit:* 3 percent  
*Landform:* Fan terraces  
*Microfeatures of landform position:* Swales

### **Unnamed, frequent long ponding**

*Percent of map unit:* 3 percent  
*Landform:* Fan terraces  
*Microfeatures of landform position:* Vernal pools

### **Munjar**

*Percent of map unit:* 2 percent  
*Landform:* Fan terraces  
*Microfeatures of landform position:* Mounds

### **Abruptic durixeralfs**

*Percent of map unit:* 2 percent  
*Landform:* Fan terraces  
*Microfeatures of landform position:* Mounds

**Tuscan**

*Percent of map unit: 2 percent*

*Landform: Fan terraces*

*Microfeatures of landform position: Mounds*

**Anita, gravelly duripan**

*Percent of map unit: 2 percent*

*Landform: Fan terraces*

*Microfeatures of landform position: Swales*

**Unnamed, riser slopes**

*Percent of map unit: 1 percent*

*Landform: Fan terraces*

## Data Source Information

Soil Survey Area: Butte Area, California, Parts of Butte and Plumas Counties

Survey Area Data: Version 9, Jun 2, 2009





# WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Ryan Avenue Property City/County: Chico / Butte County Sampling Date: 10/1/12  
 Applicant/Owner: G. Santos State: CA Sampling Point: U 01  
 Investigator(s): E. Gregg, A. Anderson Section, Township, Range: Section 34, T 23N, R 1E  
 Landform (hillslope, terrace, etc.): Fan terrace Local relief (concave, convex, none): none Slope (%): 1  
 Subregion (LRR): C - Mediterranean California Lat: \_\_\_\_\_ Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: Redsuff Gravelly Loam, 0-2% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Hydric Soil Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
Wetland Hydrology Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
Remarks:		

## VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)  Total Number of Dominant Species Across All Strata: <u>1</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0</u> % (A/B)																								
1.																												
2.																												
3.																												
4.																												
Total Cover: <u>0</u> %				<b>Prevalence Index worksheet:</b> <table border="1"> <thead> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> <th></th> </tr> </thead> <tbody> <tr><td>OBL species</td><td>x 1 =</td><td><u>0</u></td></tr> <tr><td>FACW species</td><td>x 2 =</td><td><u>0</u></td></tr> <tr><td>FAC species</td><td>x 3 =</td><td><u>135</u></td></tr> <tr><td>FACU species</td><td>x 4 =</td><td><u>0</u></td></tr> <tr><td>UPL species</td><td>x 5 =</td><td><u>275</u></td></tr> <tr><td>Column Totals:</td><td></td><td><u>100</u> (A) <u>410</u> (B)</td></tr> <tr><td colspan="2">Prevalence Index = B/A =</td><td><u>4.10</u></td></tr> </tbody> </table>	Total % Cover of:	Multiply by:		OBL species	x 1 =	<u>0</u>	FACW species	x 2 =	<u>0</u>	FAC species	x 3 =	<u>135</u>	FACU species	x 4 =	<u>0</u>	UPL species	x 5 =	<u>275</u>	Column Totals:		<u>100</u> (A) <u>410</u> (B)	Prevalence Index = B/A =		<u>4.10</u>
Total % Cover of:	Multiply by:																											
OBL species	x 1 =	<u>0</u>																										
FACW species	x 2 =	<u>0</u>																										
FAC species	x 3 =	<u>135</u>																										
FACU species	x 4 =	<u>0</u>																										
UPL species	x 5 =	<u>275</u>																										
Column Totals:		<u>100</u> (A) <u>410</u> (B)																										
Prevalence Index = B/A =		<u>4.10</u>																										
<b>Sapling/Shrub Stratum</b> 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ Total Cover: _____ %																												
<b>Herb Stratum</b> 1. <i>Festuca perennis</i> 45 FAC 2. <i>Elymus caput medusae</i> 50 Yes UPL 3. <i>Lactuca serriola</i> 3 UPL 4. <i>Eremocarpus setigerius</i> 2 UPL 5. _____ 6. _____ 7. _____ 8. _____ Total Cover: <u>100</u> %																												
<b>Woody Vine Stratum</b> 1. _____ 2. _____ Total Cover: _____ %																												
<b>% Bare Ground in Herb Stratum</b> _____ % <b>% Cover of Biotic Crust</b> _____ %																												
<b>Hydrophytic Vegetation Present?</b> Yes <input type="radio"/> No <input checked="" type="radio"/>																												
Remarks:																												

## SOIL

**Sampling Point: U 01**

[illegible]

## HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)	
Primary Indicators (any one indicator is sufficient)				
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1) (Riverine)		
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)		
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)		
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)		
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)		
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Thin Muck Surface (C7)		
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)		
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)		
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Shallow Aquitard (D3)		
		<input type="checkbox"/> FAC-Neutral Test (D5)		
Field Observations:				
Surface Water Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches):		
Water Table Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches):		
Saturation Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches):		
(includes capillary fringe)			Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:				
Remarks:				

# WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Ryan Avenue Property City/County: Chico / Butte County Sampling Date: 10/1/12  
 Applicant/Owner: G. Santos State: CA Sampling Point: W 01  
 Investigator(s): E. Gregg, A. Anderson Section, Township, Range: Section 34, T 23N, R 1E  
 Landform (hillslope, terrace, etc.): Fan terrace Local relief (concave, convex, none): slightly concave Slope (%): 1  
 Subregion (LRR): C - Mediterranean California Lat: \_\_\_\_\_ Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: Redsuff Gravelly Loam, 0-2% slopes NWI classification: Seasonal Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="radio"/>	No <input type="radio"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="radio"/> No <input type="radio"/>
Hydric Soil Present?	Yes <input checked="" type="radio"/>	No <input type="radio"/>		
Wetland Hydrology Present?	Yes <input checked="" type="radio"/>	No <input type="radio"/>		
Remarks:				

## VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
1. _____				
2. _____				
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0</u> % (A/B)
4. _____				
Sapling/Shrub Stratum				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____
1. _____				
2. _____				OBL species <u>0</u> x 1 = <u>0</u>
3. _____				
4. _____				FACW species <u>10</u> x 2 = <u>20</u>
5. _____				FAC species <u>82</u> x 3 = <u>246</u>
Total Cover: _____ %				FACU species _____ x 4 = <u>0</u>
Herb Stratum				UPL species <u>5</u> x 5 = <u>25</u>
1. <u>Lolium perenne</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	Column Totals: <u>97</u> (A) <u>291</u> (B)
2. <u>Hordeum maritimum gussoneanum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index = B/A = <u>3.00</u>
3. <u>Rumex crispus</u>	<u>2</u>		<u>FAC</u>	
4. <u>Lythrum sp.</u>	<u>10</u>		<u>FACW</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
5. <u>Convolvulus arvensis</u>	<u>5</u>		<u>UPL</u>	
6. _____				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present.
7. _____				
8. _____				Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
Total Cover: <u>97</u> %				
Woody Vine Stratum				Remarks:
1. _____				
2. _____				
Total Cover: _____ %				
% Bare Ground in Herb Stratum <u>3</u> % % Cover of Biotic Crust _____ %				

# SOIL

Sampling Point: W 01

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

Depth (inches)	Matrix		Redox Features				Texture <sup>3</sup>	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-1	5 YR 2.5/2	65	2.5 YR 4/8	30	C	M	clay loam	
			2.5 YR 2.5/1	5	C	PL		
1-4	2.5 YR 3/2	89	2.5 YR 2.5/1	1	C	PL	clay loam	
			2.5 YR 4/8	10	C	M		

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix. <sup>2</sup>Location: PL=Pore Lining, RC=Root Channel, M=Matrix.  
<sup>3</sup>Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

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

<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<b>Indicators for Problematic Hydric Soils:</b> <input type="checkbox"/> 1 cm Muck (A9) (LRR C) <input type="checkbox"/> 2 cm Muck (A10) (LRR B) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input checked="" type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Vernal Pools (F9)	

<sup>4</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present.

**Restrictive Layer (if present):**  
 Type: hardpan  
 Depth (inches): 4

Hydric Soil Present? Yes ☒ No ☐

Remarks:

# HYDROLOGY

**Wetland Hydrology Indicators:**

**Primary Indicators (any one indicator is sufficient)**

<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<b>Secondary Indicators (2 or more required)</b> <input type="checkbox"/> Water Marks (B1) (Riverine) <input type="checkbox"/> Sediment Deposits (B2) (Riverine) <input type="checkbox"/> Drift Deposits (B3) (Riverine) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Crayfish Burrows (C8) <input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input checked="" type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input checked="" type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input checked="" type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Water-Stained Leaves (B9)		

**Field Observations:**

Surface Water Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches):	
Water Table Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches):	

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: