Aquatic Resources Delineation Report

Ferndale Drainage Project

City of Ferndale

October 15, 2024, Rev 2

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This document has been prepared for:

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Appendices

1. Summary

GHD prepared this Aquatic Resources Delineation Report and accompanying appendices on behalf of the City of Ferndale (City), in support of the proposed Ferndale Drainage Project (Project) within the City of Ferndale, California (**Appendix A, Figure 1**). GHD conducted the aquatic resource delineation fieldwork on January 27th, 2022, with a follow up site visit on October 7, 2024. The delineation was conducted within the 6.5-acre Project Study Boundary (PSB) as shown in **Appendix A, Figure 2**. United States Army Corps of Engineers (USACE) three-parameter wetlands were mapped based on wetland indicative vegetation, hydric soils, and wetland hydrology. The northern portion of the PSB is located within the local jurisdiction of the Coastal Zone which is managed by Humboldt County through the Eel River Area Plan (see **Appendix A, Figure 2**), and therefore one-parameter wetlands were also eligible to be mapped. However, the PSB only contained three-parameter wetlands and no one-parameter wetlands were observed or delineated.

Two three-parameter wetlands were observed within the PSB (see **Appendix A, Figure 3**). Wetland 1 was observed running along the western edge of 5th Street in a discreet drainage pathway, and Wetland 2 was observed along southeast edge of the intersection between 5th Street and Van Ness Avenue ("Wetland 2 - South") and extended north (via a culvert) to the northern adjacent field ("Wetland 2 - North"). Wetland 2 - South, and Wetland 2 - North are hydrologically connected via a culvert beneath Van Ness Avenue. Of the three three-parameter wetlands, Wetland 1 did not appear to hydrologically connect to a receiving waterway and is therefore considered an isolated wetland and non-jurisdictional to the USACE but anticipated to be jurisdictional to the RWQCB. Wetland 2 (North and South) is located within the Salt River floodplain which has exhibited surface-level hydrologic connectivity historically and episodically. Therefore Wetland 2 (North and South) may be USACE-jurisdictional, and is anticipated to be Regional Water Quality Control Board (RWQCB)-jurisdictional. Wetland 2 - North is within the Coastal Zone, and is therefore also County jurisdictional, and Wetland 2 - South is outside of the Coastal Zone and is not anticipated to be County jurisdictional. See **Table 4.1** below for a summary of anticipated jurisdictional status, and **Appendix A, Figure 2** for the location of the Coastal Zone).

The total area of three-parameter wetlands encompasses 159,850 ft^2 or 3.67 acres, or 56% of the PSB. No Project work is proposed in Wetland 1, or Wetland 2 – South.

2. Introduction

This report supports the Project's environmental documentation, permitting, and construction planning as deemed appropriate. The proposed PSB includes the proposed area of impact and adjacent areas which encompass 6.5 acres (**Appendix A, Figure 2**). The proposed area of impact was established to identify impacts based on variations in depth, width and location of proposed facilities to be further defined during Project design. This report is subject to, and must be read in conjunction with, the limitations set out in Section 5, Special Terms and Conditions, and the assumptions and qualifications contained throughout the report.

2.1 Project Description

The proposed Project involves replacing the existing storm drain inlets with new inlets that include a combination of water quality treatment and tree planting on Arlington Avenue. A new storm drain pipe would be installed along Arlington Avenue, conveying runoff to a new storm drain pipe on 5th Street. A manhole

would be installed at the junction of the Arlington Avenue and 5th Street lines. The 5th Street pipe alignment would transition to a vegetated swale along the east side of the roadway along the frontage of the fairgrounds with culvert/pipe crossings at existing pedestrian and vehicle access points to the fairgrounds parking lot. Existing pavement in areas not identified as pedestrian or vehicle access points, would be removed. The new swale would connect to a new drain pipe below 5th Street, and runoff would then flow to the existing culvert under Van Ness Avenue, which would remain in place. After exiting the culvert, runoff would flow through over 500 feet of vegetated swale and into a detention basin. No work is proposed in Wetland 1, or in the existing ditch at 5th Street and Van Ness Avenue (Wetland 2 – South).

2.2 Project Location

The Project is located along Arlington Ave, 5th Street, a small portion of Van Ness Ave, and an adjacent agricultural pasture to the north (**Appendix A, Figure 2**). The PSB is comprised of roadway shoulders and the agricultural pasture. Trees and other woody vegetation were documented within the PSB, particularly along northern 5th Street and Van Ness Avenue, but outside of all delineated aquatic resources. The northern portion of the PSB is included in the mapped FEMA 100-year and 500-year flood zones (**Appendix A, Figure 6**).

2.3 Regulatory Background

2.3.1 Federal

Waters of the United States

The Code of Federal Regulations (CFR), 40 CFR, Section 120.2 states the following:

a) Waters of the United States means:

1) Waters which are:

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

ii) The territorial seas; or

iii) Interstate waters;

2) Impoundments of waters otherwise defined as Waters of the United States under this definition, other than impoundments of waters identified under paragraph (a)(5) of this section.

3) Tributaries of waters identified in paragraph (a)(1) or (2) of this section:

i) That are relatively permanent, standing or continuously flowing bodies of water;

4) Wetlands adjacent to the following waters:

i) Waters identified in paragraph (a)(1) of this section; or

ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection[1] to those waters;

[1] The duration of the surface connection is undefined and considered on a case by case basis; however, the wetland does not have to hydrologically be connected every day of the year to be considered waters of the United States, just continuous seasonal flow…wetlands

within the floodplain of Waters of the United States will likely be considered jurisdictional (sourced from pers. comm. with W. Connor, USACE North Branch Chief).

5) Intrastate lakes and ponds, streams, or wetlands not identified in paragraphs (a)(1) through (4) of this section that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraph (a)(1) or (a)(3) of this section.

b) The following are not "waters of the United States" even where they otherwise meet the terms of paragraphs (a)(2) through (5) of this section:

1) Waste treatment systems, including treatment ponds or lagoons, designed to meet the requirements of the Clean Water Act;

2) Prior converted cropland designated by the Secretary of Agriculture. The exclusion would cease upon a change of use, which means that the area is no longer available for the production of agricultural commodities. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA;

3) Ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water;

4) Artificially irrigated areas that would revert to dry land if the irrigation ceased;

5) Artificial lakes or ponds created by excavating or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing;

6) Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating or diking dry land to retain water for primarily aesthetic reasons;

7) Waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States; and

8) Swales and erosional features (e.g., gullies, small washes) characterized by low volume, infrequent, or short duration flow.

(c) In this section, the following definitions apply:

(1) Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

(2) Adjacent means bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes, and the like are "adjacent wetlands."

(3) High tide line means the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line

encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

(4) Ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

(5) Tidal waters means those waters that rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by hydrologic, wind, or other effects.

Wetland Delineation Manual

The 1987 USACE Wetland Delineation Manual provides guidelines and methods to determine whether an area is a wetland subject to federal regulation under Section 404 of the Clean Water Act. The manual specifies that wetland hydrology, soil, and vegetation indicators must be present to identify a wetland (USACE 1987, p. 10). In addition, the Wetlands Delineation Manual states, “If hydrophytic vegetation is being maintained only because of man-induced wetland hydrology that would no longer exist if the activity (e.g., irrigation) were to be terminated, the area should not be considered a wetland,” (USACE 1987).

Federal Geographic Data Committee (FGDC) Wetland Classification Standard

The Classification of Wetlands and Deepwater Habitats of the United States (FGDC, 2013) provides a nationally standardized hierarchical system for classifying wetland and deepwater habitats based on Cowardin et al. (1979). The National Wetland Inventory (NWI), a publicly available resource that provides information on the distribution of wetlands in the U.S., classifies wetlands according to the FDGC standard. The FDGC classification is based on a definition of wetlands with at least one of the three wetland attributes: predominantly hydrophytic vegetation, predominantly hydric soil, and hydrology. However, they state that all available information should be used, and all three attributes should be considered if they are present (FGDC 2013).

2.3.2 State

The State Water Resources Control Board’s (SWRCB) April 2021 Procedures for Discharges of Dredged or Fill Material to Waters of the State says the following:

An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area’s vegetation is dominated by hydrophytes or the area lacks vegetation.

The Water Code defines “waters of the state” broadly to include “any surface water or groundwater, including saline waters, within the boundaries of the state.” “Waters of the state” includes all “waters of the U.S.” The following wetlands are waters of the state:

1. *Natural wetlands,*
2. *Wetlands created by modification of a surface water of the state, and*

3. Artificial wetlands that meet any of the following criteria:

a. Approved by an agency as compensatory mitigation for impacts to other waters of the state, except where the approving agency explicitly identifies the mitigation as being of limited duration;

b. Specifically identified in a water quality control plan as a wetland or other water of the state;

c. Resulted from historic human activity, is not subject to ongoing operation and maintenance, and has become a relatively permanent part of the natural landscape; or

d. Greater than or equal to one acre in size, unless the artificial wetland was constructed, and is currently used and maintained, primarily for one or more of the following purposes (i.e., the following artificial wetlands are not waters of the state unless they also satisfy the criteria set forth in 2, 3a, or 3b):

i. Industrial or municipal wastewater treatment or disposal,

ii. Settling of sediment,

iii. Detention, retention, infiltration, or treatment of stormwater runoff and other pollutants or runoff subject to regulation under a municipal, construction, or industrial stormwater permitting program,

iv. Treatment of surface waters,

v. Agricultural crop irrigation or stock watering,

vi. Fire suppression,

vii. Industrial processing or cooling,

viii. Active surface mining – even if the site is managed for interim wetlands functions and values,

ix. Log storage,

x. Treatment, storage, or distribution of recycled water, or

xi. Maximizing groundwater recharge (this does not include wetlands that have incidental groundwater recharge benefits); or

xii. Fields flooded for rice growing.

All artificial wetlands that are less than an acre in size and do not satisfy the criteria set forth in 2, 3.a, 3.b, or 3.c are not waters of the state. If an aquatic feature meets the wetland definition, the burden is on the applicant to demonstrate that the wetland is not a water of the state" (SWRCB, 2019).

The April 2020 Implementation Guidance for the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State further clarifies as follows:

Human activity can cause changes to the surrounding landscape (e.g., grading activities, road construction, direct hydromodification) such that wetlands form where wetlands did not previously exist. Where such artificial wetlands are now a relatively permanent part of the natural landscape, and are not subject to ongoing operation and maintenance, they are waters of the state. By requiring that the wetlands are relatively permanent, the framework excludes wetlands that are temporary or transitory. That they are part of the natural landscape also indicates the

relative permanence of the wetlands and suggests that the wetland is self-sustaining without ongoing operation and maintenance activities, and provides similar ecosystem services as natural wetlands. By way of example, this category of wetlands includes situations where water flow is permanently redirected as the result of human activity, such as grading in another area, such that new wetlands form in areas that were previously dry. These wetlands may not be natural wetlands because they result from human activity and they were not formed by modifying a water of the state (rather they were an indirect result), but nevertheless they take on the function of natural wetlands such that they should be considered waters of the state. This category would not include artificial wetlands constructed for specific purposes listed in section II.3.d because the construction of the artificial wetlands would be too recent to be deemed "historic" and the artificial wetland would likely require ongoing maintenance such that they would not be deemed "relatively permanent," and/or the artificial wetland is not part of the "natural landscape" (SWRCB 2020).

The RWQCBs carry out and regionally regulate the SWRCB's definition of Waters of the State.

2.3.3 Local

The northern portion of the Project is within the local jurisdiction of the Coastal Zone, which is managed by Humboldt County under the Eel River Area Plan.

Eel River Area Plan

The Eel River Area Plan (ERAP; certified in 1982) uses the California Coastal Act definition of wetlands (which includes one-parameter wetlands that are defined below. The ERAP also states "*No land use or development shall be permitted in areas adjacent to coastal wetlands, called Wetland Buffer Areas, which degrade the wetland or detract from the natural resource value*" (Ch.3, p.31, Humboldt County 2014).

California Coastal Act

The Coastal Commission's "one-parameter definition" is outlined in the California Code of Regulations, Title 14 Section 13577 where it states, "*Wetland shall be defined as land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent and drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deep-water habitats*" (California Coastal Commission 2011).

The California Coastal Act Section 30121 also defines wetlands as "*[L]ands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens*" (California Coastal Commission 2011).

3. Methodology

3.1 Aquatic Resources Delineation Approach

GHD wetland scientists conducted the aquatic resource delineation on January 27th, 2022. To define a wetland, the USACE requires that vegetation, soil, and hydrology (three-parameters) all show wetland attributes (USACE 1987; USACE 2010). Wetlands in the Coastal Zone only need to meet one-parameter of the three to be present (14 CCR 13577). The wetland delineation used USACE criteria from the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region (Version 2.0)* (USACE 2010). The current standard field forms provided by the USACE (2010) were used to collect vegetation, soils, and hydrology data (**Appendix B**). As mentioned in Section 1, no one-parameter wetlands were delineated.

In potential three-parameter wetland areas, vegetation, soil, and hydrology data were collected in a transect across the upland/wetland boundary with two plots (upland/wetland) per transect. The naming convention used on datasheets to designate upland or wetland plots associated with a transect is -U or -W, respectively.

Three-parameter wetland/upland boundaries and plots were mapped in the field with an Eos Arrow 100 Submeter Global Positioning System (GPS) Receiver with Global Navigation Satellite System (GNSS) and an iPad running ArcGIS Collector software. The wetland/upland boundary was recorded with the GPS unit as needed to map the wetland's spatial extent. The points were then connected in the office using ArcMap software for figure creation and the boundaries were clipped to the extent of the PSB.

Each three-parameter wetland area was designated with a number (e.g., W1). The wetland points were also labeled with their respective wetland number. In addition to the wetland sampling points, upland sampling points were described. These were labeled beginning with a "U" and numbered in sequence (e.g., U1, U2). The upland sampling points were completed to confirm and document the absence of any wetland indicators (soils, hydrology, and vegetation). **Appendix B** contains all datasheets recorded during the delineation.

3.2 Botanical Methodology

Vegetation data collection consisted of listing the dominant species in the herbaceous, shrub, and tree layer within a standard-sized plot determined by the strata layer. Nomenclature follows *The Jepson Manual* (Baldwin et al. 2012), which was cross-checked to federal standard nomenclature to identify the indicator status. The species' wetland indicator status for the Western Mountains, Valleys, and Coast Region was denoted in the respective column, using the standard reference: *State of California 2016 Wetland Plant List* (Lichvar et al. 2018). This list classifies species based on the probability that they are found in wetlands (USACE 1987) as follows:

- Obligate (OBL): almost always in wetlands (99% probability)
- Facultative Wetland (FACW): usually occurring in wetlands (67% to 99% probability)
- Facultative (FAC): commonly occurring in wetlands and uplands (34% to 66% probability of occurring in wetlands)
- Facultative Upland (FACU): usually occurring in uplands (1% to 33% probability of occurring in wetlands)
- Upland (UPL): upland obligate, rarely in wetlands (1% in wetlands)

Species that do not appear on the list are considered to be in the upland category (Lichvar et al. 2018). Standard procedures for documenting hydrophytic vegetation indicators were used per the *Regional*

Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (USACE 2010). Site photographs have been included as **Appendix C**. A separate, forthcoming, Botanical Report contains the locations and extents of mapped vegetation alliances and Sensitive Natural Communities within the PSB (GHD 2022).

3.3 Soils Methodology

Hydric soils were defined based on the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (USACE 2010) procedures in combination with the Natural Resources Conservation Service's (NRCS) definitions presented in *Field Indicators of Hydric Soils in the United States* (USDA/NRCS 2018). Soil pits were dug to an approximate depth of 13 inches unless soil was compacted or soil was absent. Data on soil color, texture, and redoximorphic features (iron concentrations) were recorded. Any observed redoximorphic features were noted along with their percentage within the soil matrix, and care was taken to distinguish chromas of 1 and 2 indicative of an iron-depleted soil within 12 inches of the soil surface (USACE 2010; USDA/NRCS 2018).

The *Munsell Soil Color Book* (COLOR, M. 2000) was used to describe the soil colors for the entire depth of the test pit. Moist, natural soil aggregate (ped) surfaces, which had not been crushed, were used to determine the soil's color. Soils with low chroma were verified as being hydric or upland with *Field Indicators of Hydric Soils in the United States* (Version 8.2, 2018).

3.3.1 Existing Soils Information

The NRCS identifies two soil units within the PSB (**Appendix A, Figure 5;** and **Appendix D**). A brief map unit description, as generated by the NRCS, is provided for each soil unit below (NRCS 2022). Although NRCS soil mapping is informative, the scale is generally too broad to definitively characterize potential wetlands. Please see the full NRCS report included as **Appendix D** for complete details.

Swainslough, 0 to 2 percent slopes

The Swainslough 0 to 2 percent slopes map unit composition contains: 90 percent Swainslough and similar soils, and 10 percent minor components (consisting of four percent Wigi, three percent Arylnda, two percent Weott, and one percent Loleta). Swainslough soils can be found in salt marshes, backswamps, depressions and floodplains; the parent material is alluvium derived from mixed sources. Swainslough consists of silty clay loam in all horizons except for the upper horizon which is dominated by decomposed plant material. Swainslough soils are not considered prime farmland and has a Land Capability Classification (LCC) of 5w if irrigated or not irrigated. These soils are very poorly drained, and the depth to water table is 0 to 4 inches. Swainslough soil is considered a hydric soil. This soil type is in the northern portion of the Project and comprises 2.7 acres (41.3 percent) of the PSB.

Weott, 0 to 2 percent slopes

The Weott 0 to 2 percent slopes map unit composition contains: 85 percent Weott and similar soils, and 15 percent minor components (consisting of five percent Worswick, four percent Swainslough, three percent Arlynda and three percent Ferndale). Weott soils can be found in depressions and floodplains; the parent material is alluvium derived from mixed sources. Weott consists of silt loam in all horizons. Weott soils would be considered prime farmland if irrigated and drained and has an LCC of 5w if irrigated or not irrigated. These soils are very poorly drained, and the depth to water table is 0 to 4 inches. Weott soil is considered a hydric soil. This soil type is located in the central and southern portion of the Project and comprises 3.8 acres (58.7 percent) of the PSB.

3.4 Hydrology Methodology

GHD delineated wetlands within the PSB during January 27th, 2022, in the middle of the wet season, although drought conditions persisted. A WETS table showing climate data between 2002 to 2022 for the Scotia, CA, Station, and precipitation data for 30 days in northwestern Fortuna is provided in **Appendix E** (NOAA 2022). There was 0.08 inches of precipitation that fell in the last 14 days prior to survey, and 3.31 inches of precipitation was recorded within 30 days of the survey (NOAA 2022). Aerial photography and the National Wetlands Inventory were referenced before conducting fieldwork (**Appendix A, Figure 5**) (NWI 2022). The FEMA flood hazard map is also included in **Appendix A, Figure 6** (FEMA 2022). Wetland hydrology indicators, such as drainage patterns, material deposits, soil saturation, high water table, or surface water presence, were recorded in the field.

4. Results

Weather conditions during the field visits were clear and sunny. As mentioned above, 0.08 inches of precipitation was recorded within the last 14 days of the delineation which is unseasonably dry. No precipitation had fallen within the last 14 days of the follow up site visit on October 7, 2024. The PSB contains two, three-parameter wetlands: Wetland 1, which is anticipated to not be USACE- and RWQCB-jurisdictional (and is located outside of the Coastal Zone and is therefore not County-jurisdictional); Wetland 2 – North, which is anticipated to beRWQCB-, and County-jurisdictional, and potentially USACE-jurisdictional due to historic and episodic flooding and thus surface-level hydrologic connectivity to the Salt River; and Wetland 2 – South, which is anticipated to be USACE-, RWQCB-jurisdictional and is located outside of the Coastal Zone. Final jurisdictional status of aquatic resources is subject to the USACE's and RWQCB's review. Upland sampling points associated with each transect, and a singular point, were also described to confirm and document the absence of wetland indicators in these areas. **Appendix A, Figure 3** shows the results of the three-parameter wetland delineation. No one-parameter wetlands were identified. Summaries and potential jurisdictional status of each wetland is presented in **Table 4.1** below.

4.1 Wetland 1

Wetland 1 was identified along the roadside west of 5th Street in the central portion of the PSB. Wetland 1 consisted of a vegetated three-parameter wetland swale. It was observed to collect and retain water, however, did not appear hydrologically connected to a receiving waterway or stormwater inlet drain rather gradually infiltrated and the ditch characteristics were no long observed. Wetland 1 extended for approximately 800 feet along the west side of 5th Street. Wetland 1 extended west of the PSB, however the area of Wetland 1 within the PSB was mapped to 2,690 ft^2 (0.06 acres). See **Appendix A, Figure 3** for the associated map.

Wetland 1 was open and completely free of rooted woody vegetation and is classified according to the Cowardin system as a Palustrine Emergent wetland (PEM) (FGDC 2013). The vegetation was primarily characterized by herbaceous ground cover including reed fescue (*Festuca arundinacea,* FAC), Kentucky bluegrass (*Poa patensis* FAC), common velvetgrass (*Holcus lanatus,* FAC) with smaller amounts of white clover (*Trifolium repens*, FAC), creeping buttercup (*Ranunculus repens*, FAC), and little hawkbit (*Leontodon saxatilis,* FACU). Wetland 1 passed the dominance test for hydrophytic vegetation and is therefore considered to contain hydric vegetation.

Soil in Wetland 1 consisted of a 2.5Y 2.5/1 silt loam upper horizon (0-7 inches) with 15% of 2.5Y 6/8 redoximorphic features, underlain by gravel. The upper horizon contains hydric soil indicator: Redox

Depressions (F8). Wetland 1 contained a high water table, which was visible at 4 inches thick. Primary indicators of wetland hydrology were High Water Table (A2) and Saturation (A3). Wetland 1 is not hydrologically connected to a navigable waterway and is therefore considered to not be jurisdictional under USACE and RWQCB; and is located outside of the coastal zone and is therefore not under the jurisdiction of the County (**Table 4-1**). Photos are available in **Appendix C, Photo 1 and 2**. Please see attached data forms for sample points W1T1-W in **Appendix B** for additional details.

4.2 Wetland 2

Wetland 2 - South was identified on the east side of 5th Street and extended north to run along the southern edge of Van Ness Avenue. Wetland 2 - North was identified in the adjacent pasture in the northern portion of the PSB. These two areas are hydrologically connected via a culvert beneath Van Ness Avenue. Wetland 2 - South consisted of a vegetated three-parameter wetland ditch, and Wetland 2 - North can be considered pasture land with a ditch feature (fed by Wetland 2 – South) surrounded by non-ditch pastoral wetlands. Conifer trees are located along 5th Street and Van Ness Avenue adjacent to Wetland 2 - South. Wetland 2 (North and South) was mapped to 157,170 ft^2 (3.61 acres). Photos are available in **Appendix C, Photo 3 through 8**. Wetland 2 - North is within the Coastal Zone (see **Appendix A, Figure 2**). See **Appendix A, Figure 3** for the location of Wetland 2 - North and - South.

The vegetation in Wetland 2 (North and South) was herbaceous and free of woody vegetation, and is classified as a Palustrine Emergent wetland (PEM). Vegetation within Wetland 2 - South was dominated by watercress (*Nasturtium officinale,* OBL) (see, **W2-T1-W** in **Appendix B**). Vegetation in Wetland 2 - North, consisted of reed fescue (FAC), white clover (FAC), and creeping buttercup (FAC) (see **W2-T2-W** in **Appendix B**). Wetland 2 - North and - South passed the dominance test for hydrophytic vegetation.

Soil located in the Wetland 2 - South transect (W2-T1) consisted of a silty clay loam in both the upper horizon (0-6 inches) with a color of 10YR 3/1 and one percent redoximorphic conditions with a color of 10YR 6/8. The lower horizon (6-13 inches) consisted of silty clay loam with a color of 2.5Y 2.5/1, and 10 percent redoximorphic conditions with a color of 2.5Y 6/6. The hydric soil indicator is Redox Dark Surface (F6). The lower horizon was submerged during the delineation, and the upper horizon was saturated and is likely submerged during precipitation events; surface water was visible nearby. The following wetland hydrology primary indicators were observed: Surface Water (A1), High Water Table (A2), Saturation (A3) and secondary indicators: Water Stained Leaves (B9), and Drainage Patterns (B10).

Soil located in the Wetland 2 - North transect (W2-T2) consisted of silty clay loam in the sampled horizon (0-10 inches) with a color of 10YR 5/2 and 10 percent redoximorphic features with a color of 10YR 5/6. The hydric soil indicator is Depleted Matrix (F3). In addition to the W2-T2 transect, soil pits were dug randomly throughout Wetland 2 – North and redoximorphic features were prominent in all soil pits (see **Appendix C, Photo 6** for a photograph of redoximorphic features). The following wetland hydrology primary indicators were observed: Presence of Reduced Iron (C4) and secondary indicator: Geomorphic Position (D2).

Wetland 2 (North and South) is within the Salt River floodplain (see **Appendix A, Figure 6**), which is historically known to result in out-of-bank flooding during heavy precipitation events. Runoff conveyed in Wetland 2 - South flows north into Wetland 2 - North, into a series of ditches in adjacent fields, which is believed to ultimately drain west towards the Salt River through a culvert. Therefore, due to historic flooding and stormwater conveyance, it is reasonable to assume there is periodic and episodic surface-level hydrologic connectivity between Wetland 2 (North and South) and the Salt River. Recent efforts to restore the Salt River and its tributaries have reduced the frequency of Salt River out-of-bank flooding and has therefore reduced the times that Wetland 2 (North and South) is directly hydrologically connected to the Salt River. However, the hydrologic connectivity between Wetland 2 (North and South) to a navigable waterway

(Salt River) persists. Therefore, Wetland 2 - North may be under USACE jurisdiction (which requires hydrologic connectivity), and is anticipated to be under RWQCB jurisdiction, and due to its location within the Coastal Zone is under County-jurisdiction as well. Wetland 2 - South is anticipated to be under USACE and RWQCB jurisdiction, however is outside of the Coastal Zone, and is therefore not under County jurisdiction. In total, Wetland 2 – North includes 156,160 ft^2 (3.58 acres), and Wetland 2 – South includes 1,005 ft^2 (0.02 acres) (see **Table 4-1**). Please see attached data forms for sample points W2T1-W and W2T2-W in **Appendix B**.

Table 4-1 Aquatic Resources within the PSB

Wetland or Other Water Name	Location (lat/long) center of feature	Size of Wetland or Other Water (ft^2)	Jurisdictional?*		
			USACE	RWQCB	County
Wetland 1	40.586873, -124.266092	2,685	No	Yes	N/A
Wetland 2 – North	40.588992, -124.265980	156,160	Yes	Yes	Yes
Wetland 2 – South	40.587935, -124.265922	1,005	Yes	Yes	No
Total Wetlands within the PSB:		159,850 ft^2 (3.67 ac)			

*: Jurisdictional status of non-coastal zone wetlands, is subject to USACE and RWQCB review.

4.3 Upland Sampling Points

Upland sampling points were collected to characterize areas that could potentially be affected by the Project. The following upland sampling points are either singular (i.e. Up-1), or associated with wetland transect datapoints (i.e. W1-T1-U1). No wetlands were detected within the areas characterized by the following upland points. The portion of the PSB along Arlington Avenue was observed and ruderal uplands, paved roadways or graveled road shoulders were visible (see **Appendix C, Photos 9 and 10**)

4.3.1 Upland 1

The Upland 1 (Up-1) sampling point was located in the grassy shoulder east of 5th Street. This area is actively mowed and managed. Vegetation was considered hydrophytic, however included white clover (FAC) and unidentified grass which is assumed to be facultative. If the area was not mowed than it is likely that a FAC-UP species would be identifiable which would result in non-hydrophytic vegetation because the prevalence index would be greater than 3. Soil contained a restrictive layer at approximately three inches below ground surface which appeared to be hardened clay. Redoximorphic features were observed in the lower soil horizon (3 to 13 inches), which is likely a function of compaction from the high clay content and intermittent car use. No primary or secondary wetlands hydrology indicators were observed.

4.3.2 Upland Transect 1

The upland sample point of the Wetland 1 transect (W1T1-U1) was in the roadway of 5th Street and characterizes the extent of Wetland 1, i.e. that everything between 5th Street and the western PSB exhibited wetland characteristics. The location was a roadway therefore did not contain vegetation, hydric soil or wetlands hydrology.

4.3.3 Upland Transect 2

The upland sample point of the Wetland 2 transect (W2-T1-U2) was located on the outer extent of Wetland 2 - South ditch along Van Ness Avenue. The elevation of this location appeared to be consistent with the

elevation of areas adjacent to it (i.e. where conifer trees were observed across ditch). The site was dominated by reed fescue (FAC), Kentucky blue grass (FAC), little hawkbit (FACU), common groundsel (*Senecio vulgaris,* FACU), and chickweed (*Stellaria media,* FACU). The soil contained abundant organic matter underlain by fill material. No redoximorphic features were observed in the soil. The site did not show any primary or secondary indicators of wetland hydrology.

4.3.4 Upland Transect 3

The upland sample point of the Wetland 2 transect (W2-T2-U3) was located adjacent to the southern extent of the Wetland 2 – North, and was at a higher elevation than the adjacent pasture. Vegetation at this site included predominantly facultative-upland species including: chickweed (FACU), reed fescue (FAC), red sorrel (*Rumex acetosella, FACU),* common groundsel (FACU)*,* ribwort plantain *(Plantago lanceolata, FACU).* Soil in this location contained gravel and cobbles, and appeared to be fill material. No redoximorphic conditions were observed. The site did not show any primary or secondary indicators of wetland hydrology.

Table 4-2. Upland Sampling Point Locations

Upland Sample Point	Location (lat/long) center of transect
Up-1	40.586389, -124.265916
W1T1-U1 (Upland Transect 1)	40.586315, -124.266070
W2T1-U2 (Upland Transect 2)	40.587984, -124.265874
W2T2-U3 (Upland Transect 3)	40.588079, -124.266146

5. Conclusions

The aquatic resources delineation for the Ferndale Drainage Project, completed on January 27th 2022 with a follow up visit on October 7th, 2024, determined the extent of three-parameter wetlands within the PSB based on hydrophytic vegetation, hydric soils, and wetland hydrology using methods and indicators outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region (Version 2.0)* (USACE 2010). The total area of three-parameter wetlands mapped within the PSB is 159,850 ft^2 (3.67 acres), however due to the lack of surface-level hydrological connections between Wetland 1 and a receiving waterway Wetland 1 is not considered jurisdictional to the USACE, and would be potentially jurisdictional to the RWQCB. Wetland 2 (North and South) is historically and episodically hydrologically connected to the Salt River to the north. Wetland 2 - North may be USACE-jurisdictional, and is anticipated to be under RWQCB jurisdiction (subject to USACE and RWQCB review), and due to its location within the Coastal Zone is under County jurisdiction as well. Wetland 2 - South is anticipated to be under USACE and RWQCB jurisdiction (subject to their review), however is outside of the Coastal Zone, and is therefore not under County jurisdiction. No Project work is proposed in Wetland 1 or Wetland 2 – South.

The total area of three-parameter wetlands encompasses 159,850 ft^2 or 3.67 acres, or 56% of the PSB. Data forms are attached showing sample plot data collected in transects across wetland boundaries and additional upland sampling points (**Appendix B**).

6. Special Terms and Conditions

6.1 Purpose of this Report

GHD prepared this report for the City of Ferndale, and the City may only use and rely on this report for the purpose agreed upon between GHD and the City, as set out in the scope and contract for work effort reported herein. GHD Inc. is not liable for any action arising out of the reliance of any third party on the information contained within this report. GHD otherwise disclaims responsibility to any entity other than the City arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

6.2 Scope and Limitations

This report does not authorize any individuals to develop, fill, or alter the delineated wetlands. Verification of the delineation by jurisdictional agencies is necessary prior to the use of this report for planning and development purposes. A USACE delineation map, and a jurisdictional approval letter are required to signify confirmation of delineation results. In situations where a field investigation determines that no jurisdictional wetlands occur, jurisdictional concurrence with these findings is recommended.

The delineation conclusions were based on the information available during the period of the investigation, which took place on January 27th, 2022 with a follow up site visit on October 7th, 2024.

The opinions, conclusions, and any recommendations in this report are based on conditions encountered and information reviewed by the date of preparation of the report. Site conditions may change after the date of this report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change unless contracted to do so.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions, and any recommendations in this report are based on the information obtained from and testing undertaken at or in connection with specific sample points. Conditions at other locations of the site may be different from the conditions found at the specific sample points.

7. References

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8. Report Preparers

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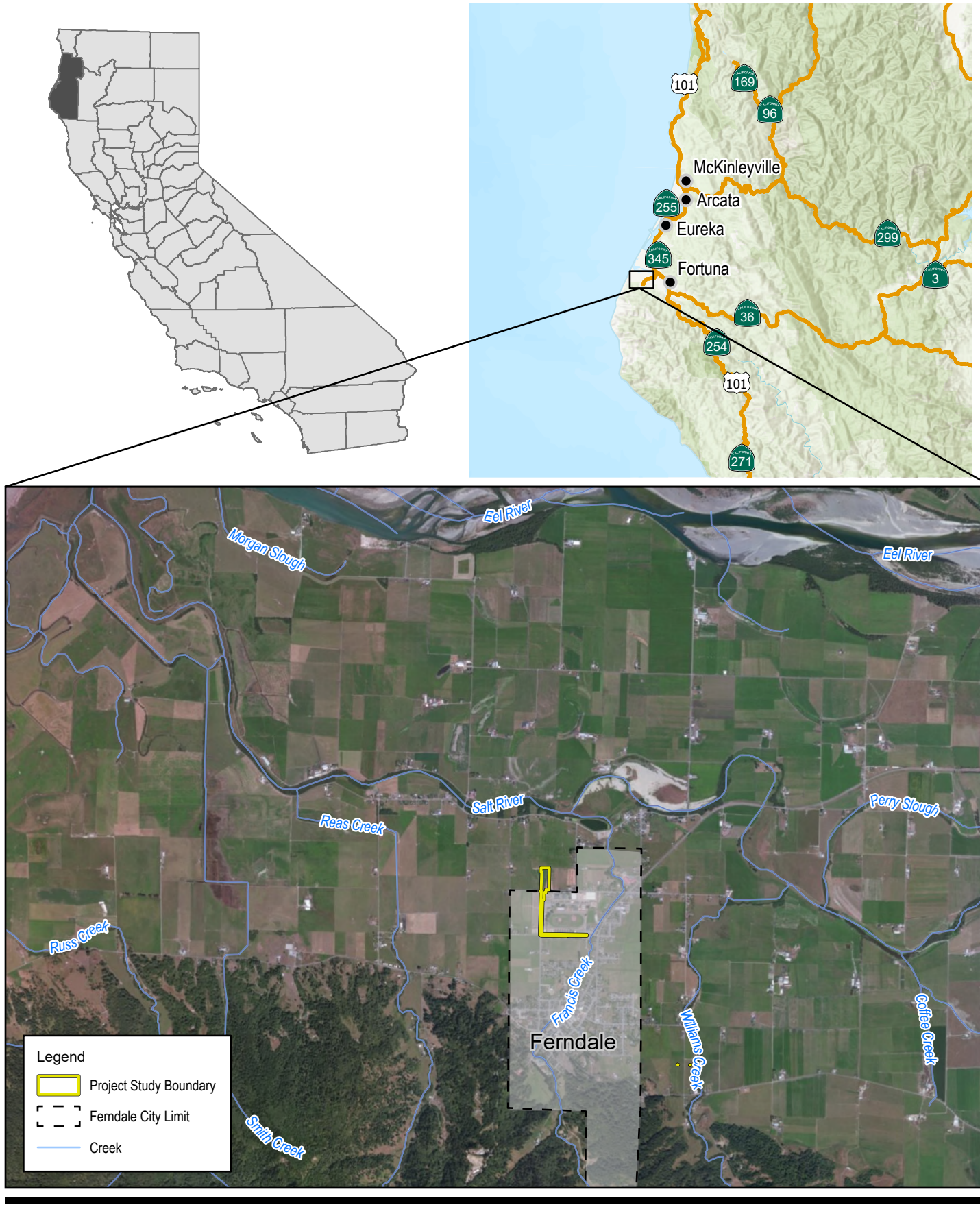
Appendices

Appendix A

Figures



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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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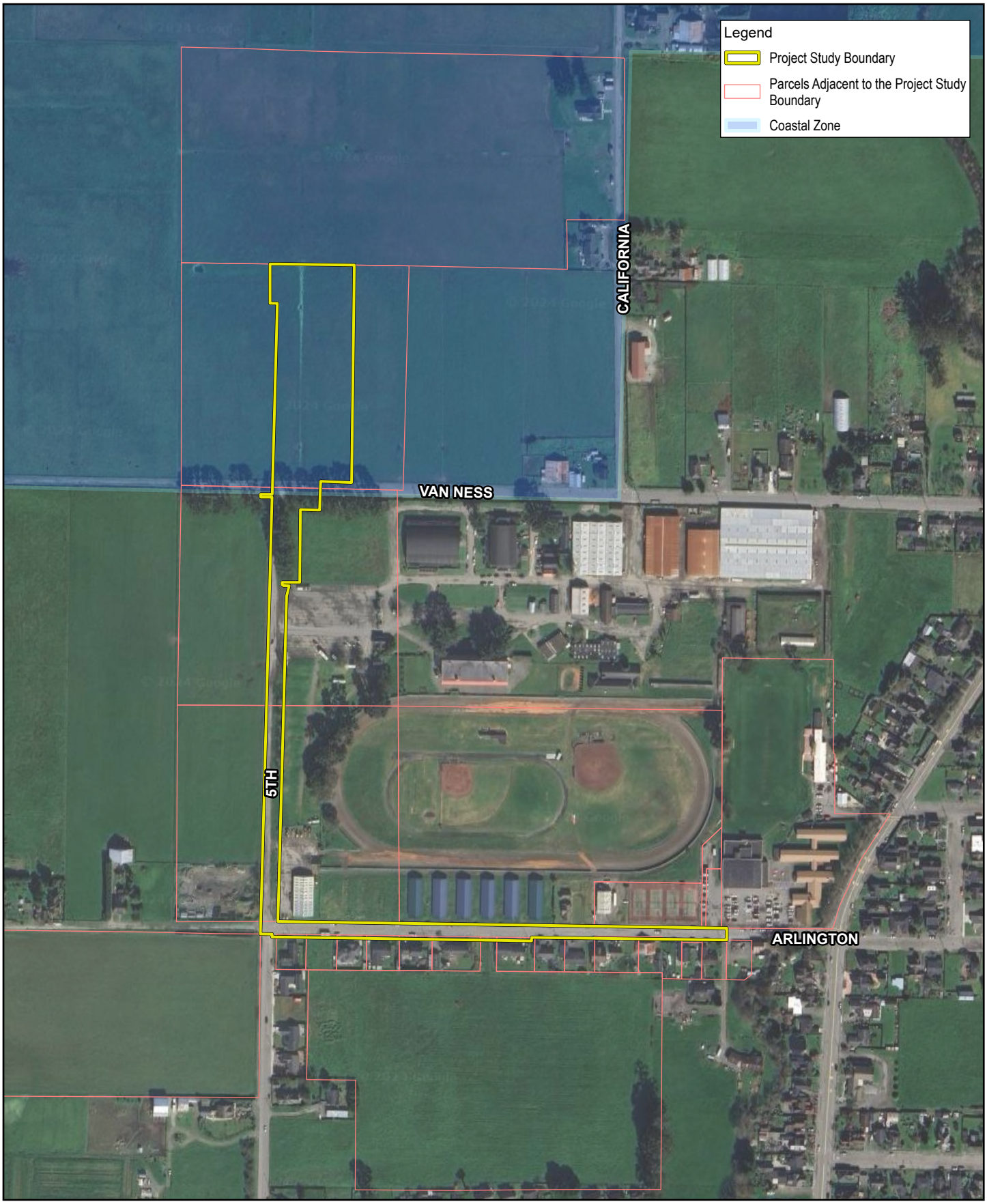
GHD

City of Ferndale
Ferndale Drainage Project

Project No. **12638533**
Revision No. **-**
Date **Oct 2024**

Project Vicinity

FIGURE 1



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Map Projection: Lambert Conformal Conic
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Ferndale Drainage Project

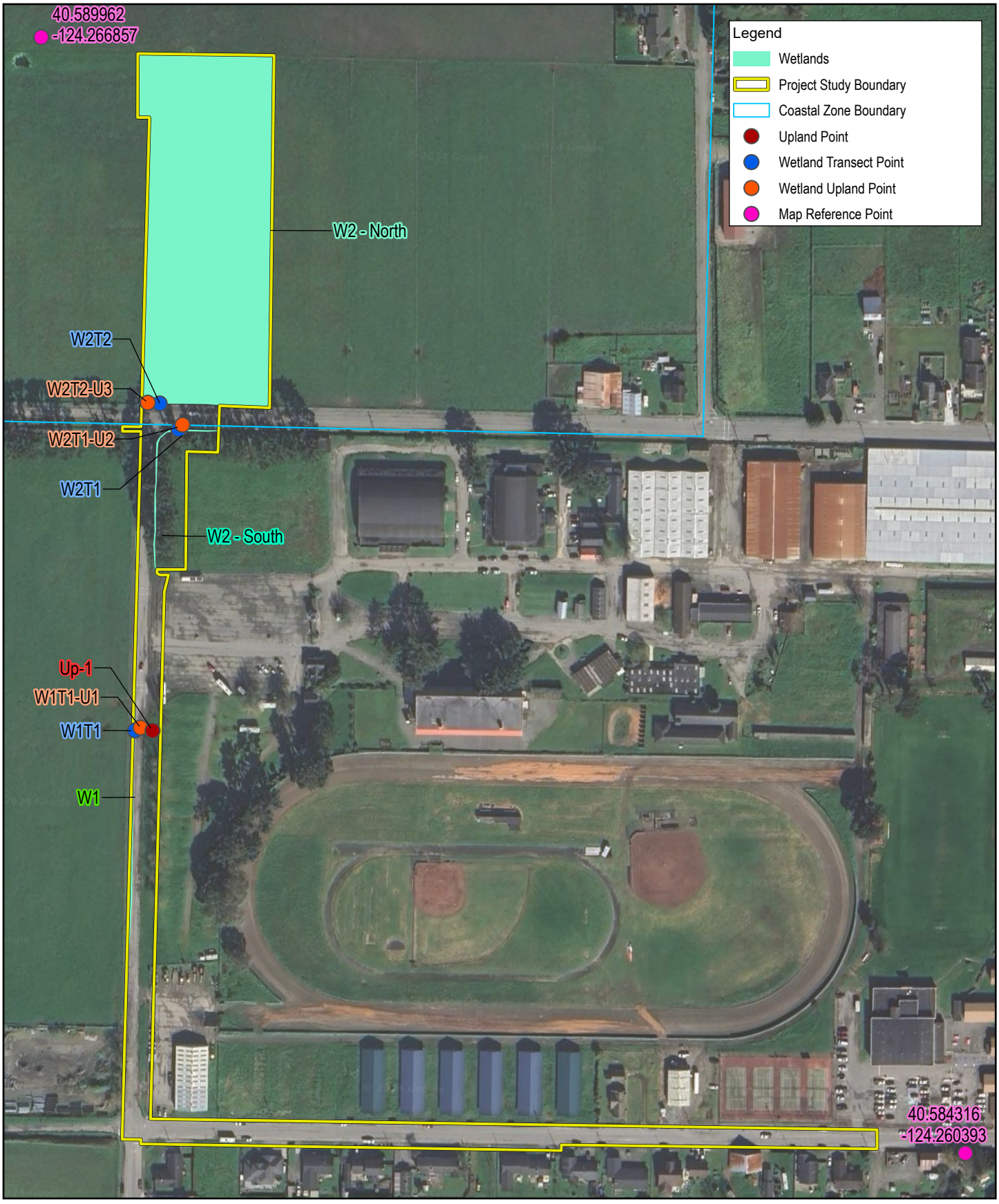
Project Area

Project No. 12638533
Revision No. -
Date Oct 2024

FIGURE 2

N:\US\Azure\EastUS\12638533\GIS\Maps\Deliverables\12638533_AquaticResourceDelineationRPT.aprx
Print date: 30 Oct 2024 - 11:50

Data source: Humboldt County, Google Maps Sat; © OpenStreetMap (and) contributors, CC-BY-SA. Created by: mhargrave



Paper Size ANSI A

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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Revision No. **-**
Date **Nov 2024**

Aquatic Resource Delineation

FIGURE 3

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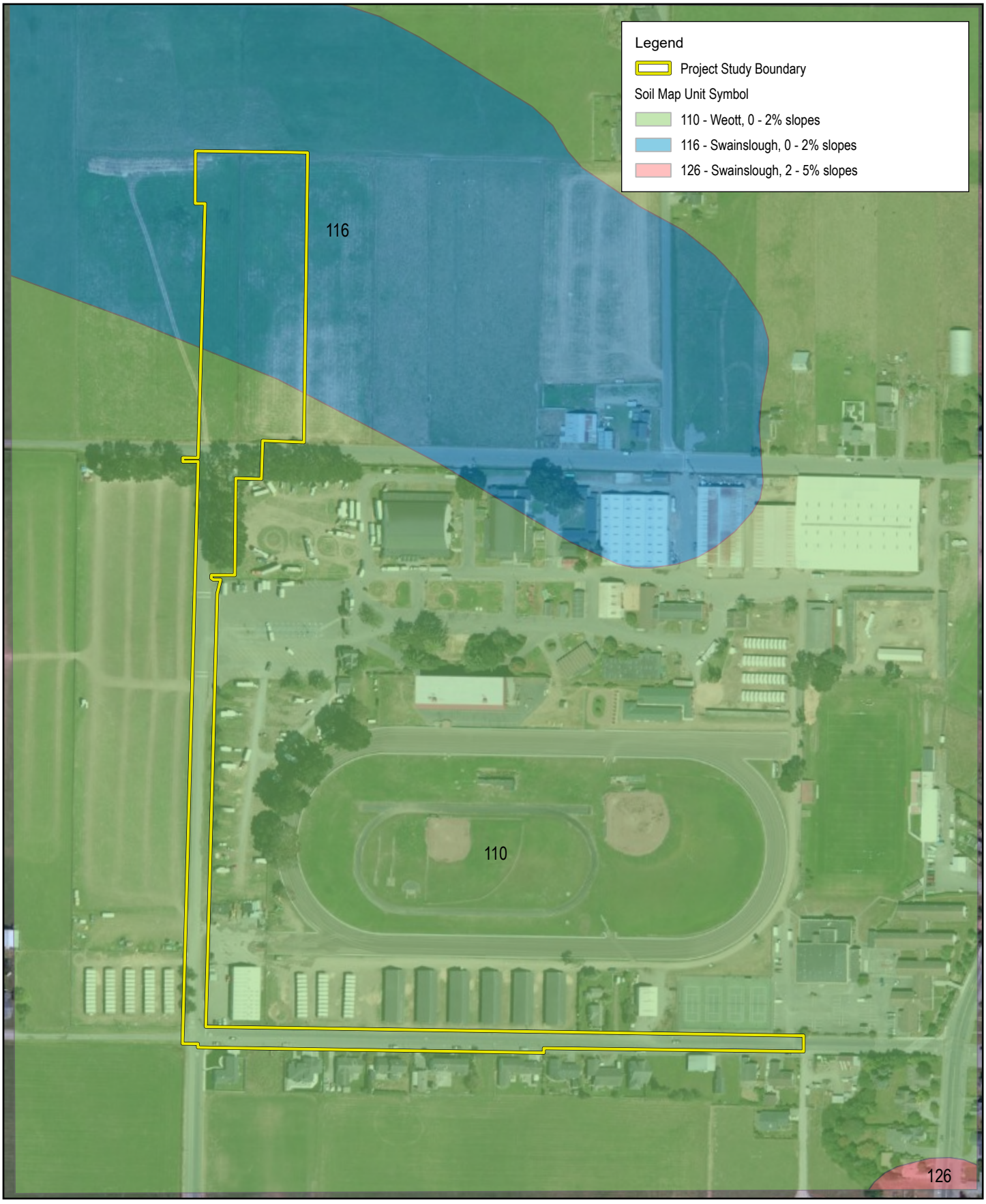

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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Ferndale Drainage Project

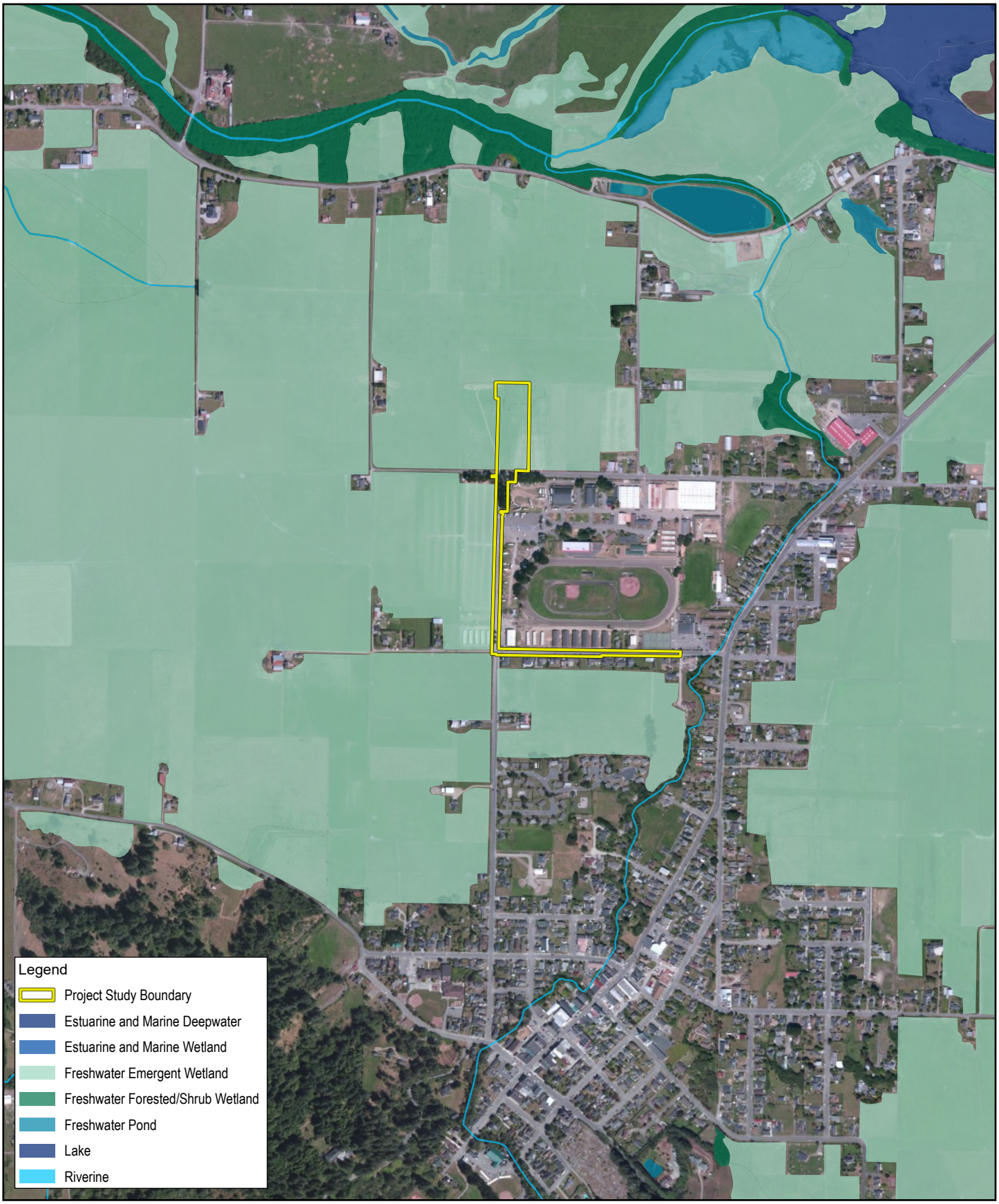
Project No. **12638533**
Revision No. **-**
Date **Oct 2024**

NRCS Soils

FIGURE 4

N:\US\Azure\EastUS\12638533\GIS\Maps\Deliverables\12638533_AquaticResourceDelineationRPT.aprx - 12638533_004_NRCSSoils
Print date: 30 Oct 2024 - 11:51

Data source: World Imagery (Clarity): Source: Esri, Maxar, Earthstar Geographics, IGN, and the GIS User Community. NRCS Web Soil Survey, Feb 2021. Created by: mhargrave



Paper Size ANSI A

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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City of Ferndale
Ferndale Drainage Project

Project No. **12638533**
Revision No. **-**
Date **Oct 2024**

National Wetlands Inventory

FIGURE 5

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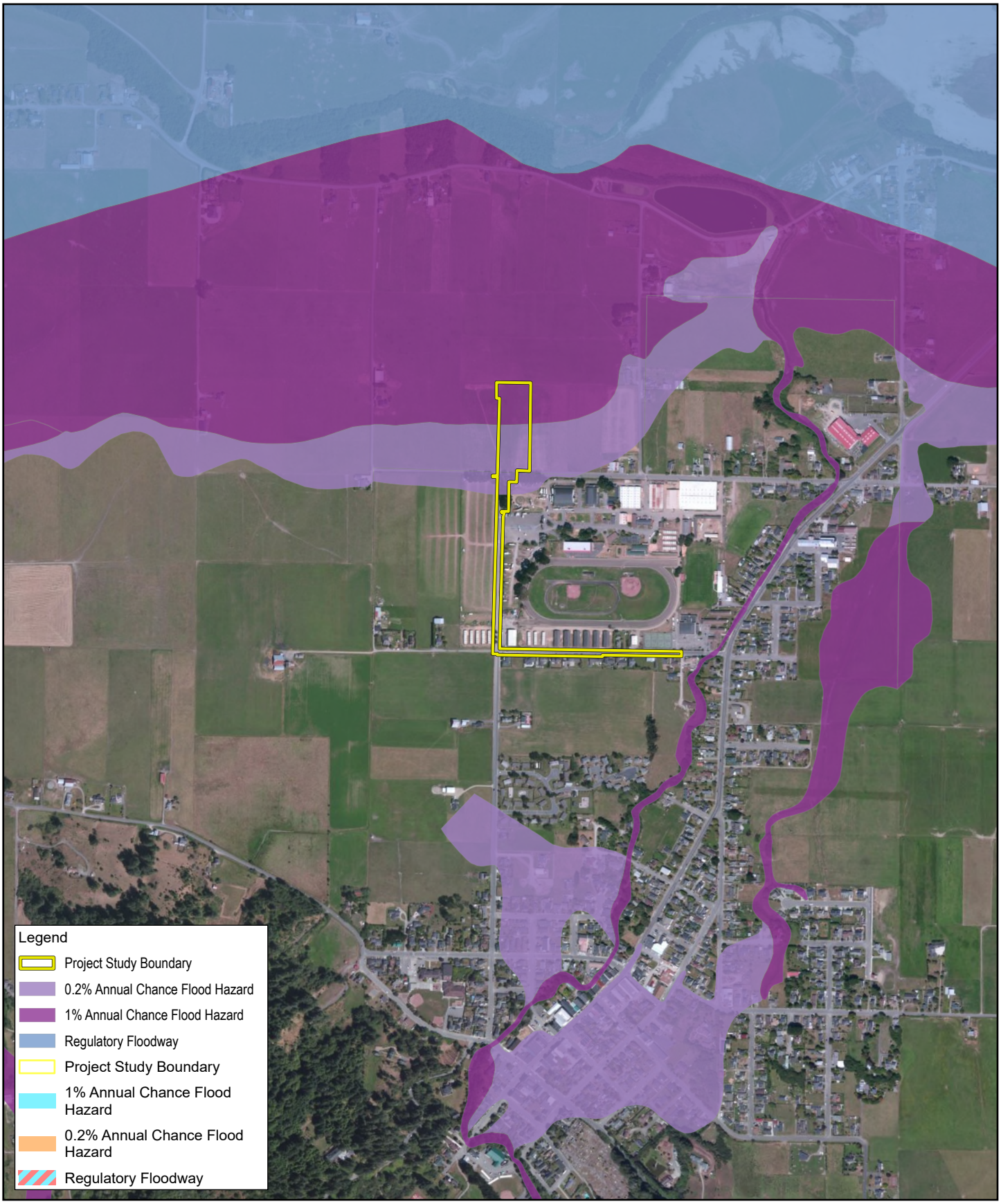
Data source: World Imagery (Clarity): Source: Esri, Maxar, Earthstar Geographics, IGN, and the GIS User Community. USFWS and National Wetlands Inventory.
Created by: mhargrave



Paper Size ANSI A

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

City of Ferndale
Ferndale Drainage Project

Project No. **12638533**
Revision No. **-**
Date **Oct 2024**

FEMA FIRM Map

FIGURE 6

N:\US\Azure\EastUS\12638533\GIS\Maps\Deliverables\12638533_AquaticResourceDelineationRPT.aprx - 12638533_006_FEMA_FIRM
Print date: 30 Oct 2024 - 11:57

Data source: World Imagery (Clarity): Source: Esri, Maxar, Earthstar Geographics, IGN, and the GIS User Community. Created by: mhargrave

Appendix B

Datasheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Ferndale 1256 1178 City/County: Ferndale / Humboldt Sampling Date: 1/27/2022

Applicant/Owner: GHD for the city of ferndale State: CA Sampling Point: WITI-W

Investigator(s): Rose E. Dana, Kerry McNamee Section, Township, Range: S2 T2N R2W

Landform (hillslope, terrace, etc.): none - flat Local relief (concave, convex, none): swale ditch Slope (%): 1

Subregion (LRR): A Lat: 40.586411 Long: -124.266075 Datum: WGS84

Soil Map Unit Name: Weott, 0-2% slopes NWI classification: PEMI

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m²)			
1. Festuca arundinacea	30	Y	FAC
2. Ranunculus repens	2		FAC
3. Trifolium repens	5		FAC
4. Holcus lanatus	10		FAC
5. Poa pratensis	18	Y	FAC
6. Leontodon saxatilis	5		FACU
7.			
8.			
9.			
10.			
11.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	65	x 3 =	195
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	70 (A)		215 (B)

Prevalence Index = B/A = 3.07

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- Y 2 - Dominance Test is >50%
- N 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

1/27/22- 1256 | 178

SOIL

Sampling Point: W1-T1-W

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	2.5Y 2.5/1	85	2.5Y 6/8	15	C	M	silt loam	compact gravel underlying soil
7+	gravel							dk rich + dark + a lot of redox

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: compacted gravel

Depth (inches): 7inched

Hydric Soil Present? Yes X No ___

Remarks:

Redox present,

located adjacent to roadway and ag field across from the fairgrounds.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

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

Water Table Present? Yes X No ___ Depth (inches): 4 11

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0.5 11

Wetland Hydrology Present? Yes X No ___

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

Remarks:

pooling water, wet soil - up to surface, no ponded water though

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Ferndale Drainage City/County: Ferndale / Humboldt Sampling Date: 1/27/22

Applicant/Owner: City of Ferndale State: CA Sampling Point: W1-T1-U

Investigator(s): R. Dana, K. McNamee Section, Township, Range: _____

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

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

Soil Map Unit Name: _____ NWI classification: Uplands

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

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

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

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

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

Remarks:

Roadway adjacent to wetlands.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

No vegetation present; paved roadway

1/27/22

SOIL

Sampling Point: W1-T1-U

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No soil is present; paved roadway.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

No wetlands hydrology present; paved roadway

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Ferndale 12561178 City/County: Ferndale/Humboldt Sampling Date: 1/27/2022

Applicant/Owner: GHD for the City of ferndale State: CA Sampling Point: W2TL-W

Investigator(s): Rose E. Dana Kerry McNamee Section, Township, Range: _____

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

Subregion (LRR): A Lat: 40.587972 Long: -124.265833 Datum: WGS 84

Soil Map Unit Name: Weott, 0-2% slopes NWI classification: PEM1

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

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

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓ No _____	Is the Sampled Area within a Wetland? Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m²)			
1. Nasturium officinale	100%	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 0 (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

Y 2 - Dominance Test is >50%

Y 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

1/27/22

"Ditch 1 polygon → 3 par polygon"

SOIL

Sampling Point: W2-T1-W

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	99	10YR 6/8	1%	C	M	silty clay loam	
6-13	2.5Y 2.5/1	90%	2.5Y 6/6	10%	C	M	silty clay loam	wet/submerged

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Wetlands ditch. lower horizon submerged, and upper horizon likely submerged during rain events.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ✓ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): ___ — nearby

Water Table Present? Yes ✓ No ___ Depth (inches): 5"

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 3"

Wetland Hydrology Present? Yes X No _____

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

Remarks:

ditch feature w/ pools of standing water.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Ferndale 12561178 City/County: Ferndale / Humboldt Sampling Date: 1/27/2022

Applicant/Owner: GHD for the city of Ferndale State: CA Sampling Point: W2TI-U

Investigator(s): ROSE E. DANA, KERRY McNAMEE Section, Township, Range: _____

Landform (hillslope, terrace, etc.): ditch Local relief (concave, convex, none): slope-convex Slope (%): 10

Subregion (LRR): A Lat: 40.587972 Long: -124.265833 Datum: WGS 84

Soil Map Unit Name: Weott, 0-2% slopes NWI classification: PEM

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

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

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes _____	No ✗	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✗	
Wetland Hydrology Present?	Yes _____	No ✗	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 1m2)			
1. Festuca arundinacea	Y	53	FAC
2. Poa annua		15	FAC
3. Senecio vulgare		5	FACU
4. Leontodon saxatilis		5	FACU
5. Stellaria media		2	FACU
6.			
7.			
8.			
9.			
10.			
11.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 0 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	68	x 3 =	204
FACU species	12	x 4 =	48
UPL species	0	x 5 =	0
Column Totals:	80 (A)		252 (B)

Prevalence Index = B/A = 3.15

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- Y 2 - Dominance Test is >50%
- N 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: W2-T1-U

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 4/2	100%	—	—	—	—	Sandy loam	A lot of organic matter intermixed in the soil

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:

fill along the wetlands' ditch — intermixed w/roots.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ____ No X

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

Remarks:

Upper banks adjacent to wetlands ditch. Slopes downwards towards ditch.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Ferndale 12561178 City/County: Ferndale / Humboldt Sampling Date: 1/27/2022

Applicant/Owner: GHD for the city of Ferndale State: CA Sampling Point: W2-T2-W

Investigator(s): R Dana, KMcNamee Section, Township, Range: _____

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

Subregion (LRR): A Lat: 40.588124 Long: -124.266059 Datum: WGS84

Soil Map Unit Name: Weott, 0-2 % Slopes NWI classification: PEM

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

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

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1 m²)			
1. Festuca arundinacea	50	Y	FAC
2. Trifolium repens	10		FAC
3. Ranunculus repens	20	Y	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species 80	x 3 =	240
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: 80	(A)	240 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

Y 2 - Dominance Test is >50%

Y 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ 5 - Wetland Non-Vascular Plants[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: W2-T2-W

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR5/2	90%	10YR5/6	10%	C	M	silty clay loam	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

grazed field - a lot of redox - esp in less disturbed locations w/in the field.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- X Presence of Reduced Iron (C4) ? - check.
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Ferndale 12561178 City/County: Ferndale / Humboldt Sampling Date: 1/27/2022

Applicant/Owner: GHD for the city of Ferndale State: CA Sampling Point: W2-T2-U

Investigator(s): R. Dana K. McNamee Section, Township, Range:

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

Subregion (LRR): A Lat: 40.588087 Long: -124.266070 Datum: WGS84

Soil Map Unit Name: Weott, 0-2% NWI classification: PEM?

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m²)			
1. Stellaria media	35	Y	FACU
2. Festuca arundinacea	35	Y	FAC
3. Rumex acetosella	15		FACU
4. Senecio vulgare	5		FACU
5. Plantago lanceolata	5		FACU
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	35	x 3 =	105
FACU species	65	x 4 =	260
UPL species		x 5 =	
Column Totals:	100 (A)		365 (B)

Prevalence Index = B/A = 3.65

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- N 2 - Dominance Test is >50%
- N 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

SOIL

Sampling Point: W2-T2-U

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-13	2.5 y 3/2	100					loam	Contains some stones & gravel - appears to be fill material

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

along outer fence line adjacent to roadway.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

adjacent to road & field - higher in elevation than adjacent field.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Ferndale Drainage City/County: ferndale Sampling Date: 10/7/24
Applicant/Owner: City of Ferndale State: CA Sampling Point: Up-1
Investigator(s): K. McNamee Section, Township, Range:
Landform (hillslope, terrace, etc.): flat road shoulder Local relief (concave, convex, none): none Slope (%):
Subregion (LRR): Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No 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.

Hydrophytic Vegetation Present? Yes ____ No ____
Hydric Soil Present? Yes ____ No ____
Wetland Hydrology Present? Yes ____ No ____
Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
Vegetation mowed; soil appears leached and compacted - likely from initial road construction and use of road shoulder by cars at times.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Trifolium repens	15%	N	Fac
2. mowed grass - poa sp. (?)	75%	Y	Fac
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	
FACW species	0	x 2 =	
FAC species	90	x 3 =	270
FACU species	0	x 4 =	
UPL species	0	x 5 =	
Column Totals:	90 (A)		270 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:
__ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ 5 - Wetland Non-Vascular Plants[1]
__ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: Up-1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5YR 2.5/2	100					loamy sand w/o.m.	
3-13	2.5Y 4/2	85	7.5YR 5/6	15	C	M	silty clay	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: hardened clay - likely compacted from cars parking on shoulder or using it as a road.

Depth (inches): 3"

Hydric Soil Present? Yes X No ___

Remarks:

Lower horizon extremely difficult to dig into. High clay content. Moddled redox.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ___ No X

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

Remarks:

No drainage patterns or depressions. Flat area. No wetlands hydrology observed.

Appendix C

Site Photographs

Photo 1. Visible water table within Wetland 1.

Photo 2. View of Wetland 1 site conditions.

Photo 3. Southern extent of Wetland 2 – South (ditch characteristics) along 5th Street.

Photo 4. Central portion of Wetland 2 - South ditch along Van Ness Avenue.

Photo 5. Wetland 2 - North site conditions.

Photo 6. Redoximorphic conditions within Wetland 2 - North.

Photo 7. Culvert connecting Wetland 2 - South with Wetland 2 – North beneath Van Ness Avenue.

Photo 8. Wetland 2 - North, note standing water and ditch feature in center.

Photo 9. Upland conditions along Arlington Avenue.

Photo 10. Upland conditions along Arlington Avenue.

Photo 11. Upland conditions along 5th Street (Upland-1).

Appendix D

NRCS Custom Soil Resources Report

United States Department of Agriculture

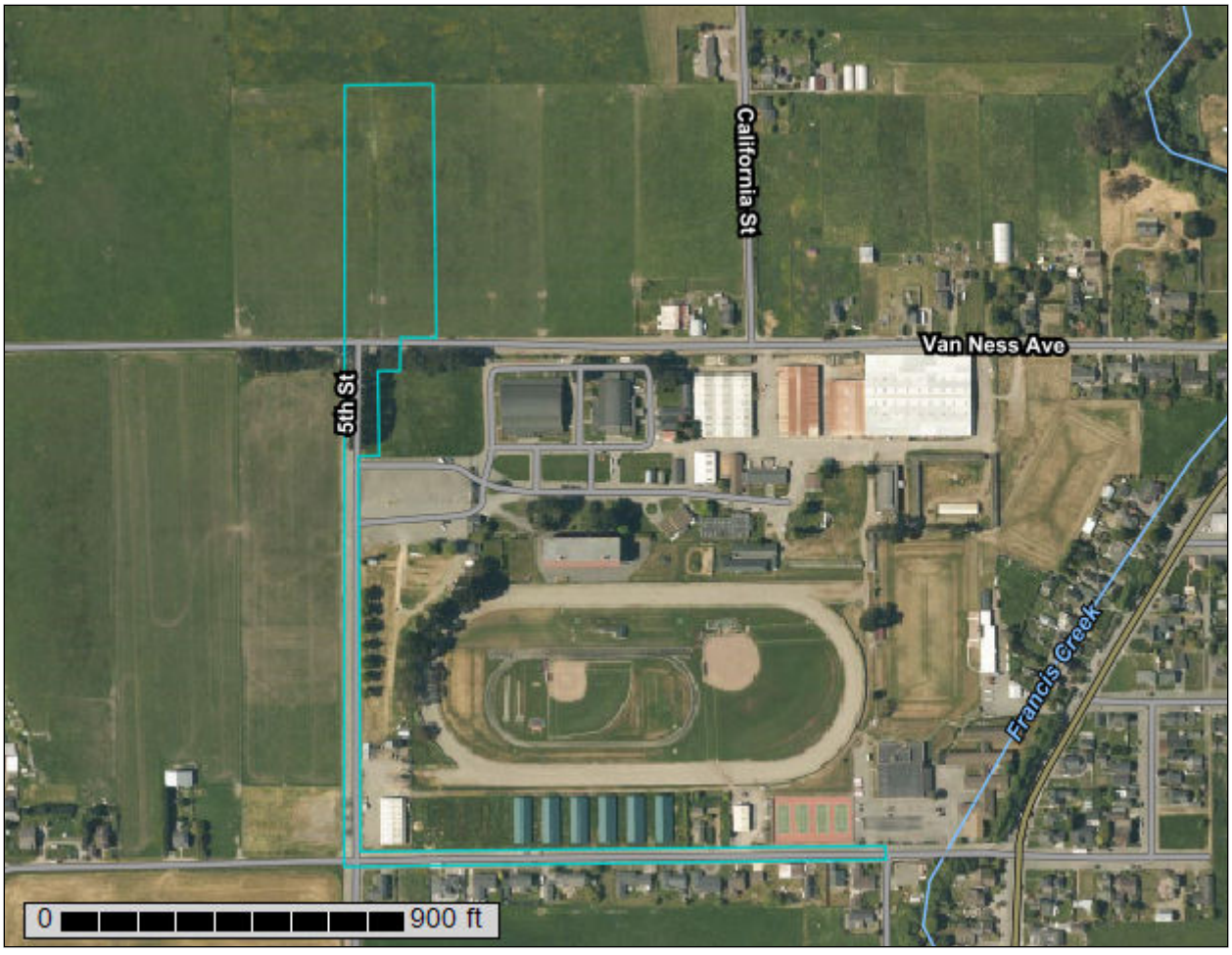
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Humboldt County, Central Part, California

12561178 City of Ferndale Proposition 1 Technical Assistance



February 22, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Map Scale: 1:3,650 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Humboldt County, Central Part, California
Survey Area Data: Version 7, Sep 6, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 8, 2019—Jun 21, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Ferndale Drainage Project)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
110	Weott, 0 to 2 percent slopes	3.8	58.7%
116	Swainslough, 0 to 2 percent slopes	2.7	41.3%
Totals for Area of Interest		**6.5**	**100.0%**

Map Unit Descriptions (Ferndale Drainage Project)

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

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

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

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

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

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

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

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

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

Humboldt County, Central Part, California

110—Weott, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hs3l
Elevation: 0 to 150 feet
Mean annual precipitation: 35 to 80 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 275 to 330 days
Farmland classification: Prime farmland if irrigated and drained

Map Unit Composition

Weott and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Weott

Setting

Landform: Backswamps, depressions, flood-plain steps
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Alluvium derived from mixed sources

Typical profile

Ap - 0 to 12 inches: silt loam
Bg1 - 12 to 26 inches: silt loam
Bg2 - 26 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 0 to 4 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): 5w
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: R004BA205CA - Marshlands
Hydric soil rating: Yes

Minor Components

Worswick

Percent of map unit: 5 percent
Landform: Natural levees, flood-plain steps

Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Swainslough

Percent of map unit: 4 percent
Landform: Backswamps, depressions, flood-plain steps, salt marshes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

Arlynda

Percent of map unit: 3 percent
Landform: Meander scars, backswamps, depressions, flood-plain steps
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

Ferndale

Percent of map unit: 3 percent
Landform: Flood-plain steps
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

116—Swainslough, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hs3n
Elevation: 0 to 160 feet
Mean annual precipitation: 35 to 80 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 275 to 330 days
Farmland classification: Not prime farmland

Map Unit Composition

Swainslough and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swainslough

Setting

Landform: Salt marshes, backswamps, depressions, flood-plain steps
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Alluvium derived from mixed sources

Typical profile

Oi - 0 to 3 inches: slightly decomposed plant material
A - 3 to 12 inches: silty clay loam
Bg1 - 12 to 20 inches: silty clay loam
Bg2 - 20 to 29 inches: silty clay loam
Bg3 - 29 to 38 inches: silty clay loam
Bg4 - 38 to 65 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 0 to 4 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): 5w
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: R004BA205CA - Marshlands
Hydric soil rating: Yes

Minor Components

Wigi, occasionally flooded

Percent of map unit: 4 percent
Landform: Salt marshes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Arlynda

Percent of map unit: 3 percent
Landform: Meander scars, backswamps, depressions, flood-plain steps
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

Weott

Percent of map unit: 2 percent
Landform: Backswamps, depressions, flood-plain steps
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

Loleta

Percent of map unit: 1 percent
Landform: Alluvial fans, fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

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Appendix E

Record of Climatological Observations and WETS Table

Date	Max Temperature	Min Temperature	Avg Temperature	Precipitation (inches)	Snowfall	Snow Depth
2021-12-27	M	M	M	1.06	M	M
2021-12-28	M	M	M	0.05	T	M
2021-12-29	M	M	M	0.31	M	M
2021-12-30	M	M	M	M	M	M
2021-12-31	M	M	M	0.18	M	M
2022-01-01	M	M	M	M	M	M
2022-01-02	M	M	M	M	M	M
2022-01-03	M	M	M	0.04	M	M
2022-01-04	M	M	M	0.63	M	M
2022-01-05	M	M	M	0.43	M	M
2022-01-06	M	M	M	0.13	M	M
2022-01-07	M	M	M	0.18	M	M
2022-01-08	M	M	M	0.23	M	M
2022-01-09	M	M	M	M	M	M
2022-01-10	M	M	M	M	M	M
2022-01-11	M	M	M	M	M	M
2022-01-12	M	M	M	M	M	M
2022-01-13	M	M	M	0.05	M	M
2022-01-14	M	M	M	0.03	M	M
2022-01-15	M	M	M	M	M	M
2022-01-16	M	M	M	M	M	M
2022-01-17	M	M	M	M	M	M
2022-01-18	M	M	M	M	M	M
2022-01-19	M	M	M	M	M	M
2022-01-20	M	M	M	M	M	M
2022-01-21	M	M	M	M	M	M
2022-01-22	M	M	M	M	M	M
2022-01-23	M	M	M	M	M	M
2022-01-24	M	M	M	M	M	M
2022-01-25	M	M	M	M	M	M
2022-01-26	M	M	M	M	M	M
2022-01-27	M	M	M	M	M	M
Average|Sum	**M**	**M**	**M**	**3.32**	**M**	**M**

WETS Table

WETS Station: SCOTIA, CA								
Requested years: 2002 - 2022								
Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	57.5	42.6	50.1	7.40	3.65	9.04	10	-
Feb	58.5	42.4	50.4	6.75	3.44	8.24	9	-
Mar	60.1	43.6	51.9	6.97	4.42	8.41	11	-
Apr	62.2	45.5	53.8	3.87	2.16	4.72	8	-
May	65.0	49.0	57.0	1.69	0.75	2.06	4	-
Jun	68.6	51.9	60.3	0.49	0.14	0.54	1	-
Jul	71.4	54.0	62.7	0.11	0.02	0.09	0	-
Aug	-	-	-	-	-	-	-	-
Sep	-	-	-	-	-	-	-	-
Oct	-	-	-	-	-	-	-	-
Nov	61.6	45.4	53.5	4.81	3.28	5.74	9	-
Dec	55.6	42.0	48.8	9.75	4.92	11.91	12	-
Annual:					-	-		
Average	-	-	-	-	-	-	-	-
Total	-	-	-	-			-	-

GROWING SEASON DATES			
Years with missing data:	24 deg = 1	28 deg = 2	32 deg = 2
Years with no occurrence:	24 deg = 20	28 deg = 18	32 deg = 0
Data years used:	24 deg = 20	28 deg = 19	32 deg = 19
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	No occurrence	Insufficient data	Insufficient data
70 percent *	No occurrence	Insufficient data	Insufficient data
* Percent chance of the growing season occurring between the Beginning and Ending dates.			

STATS TABLE - total precipitation (inches)

Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1926	7.18	10.17	T	1.53	1.17	0.00	0.00	0.21	0.51	5.67	18.65	7.95	53.04
1927		13.15	3.66	4.01	1.53	1.35	T	0.00	0.36	1.67	9.29	4.11	39.13
1928	4.31	3.81	7.43	6.77	0.11	0.56	T	0.03	0.27	0.69	6.42	8.00	38.40
1929	3.11	3.25	3.15	2.20	0.16	1.75	0.00	0.00	0.00	0.16	T	9.37	23.15
1930	6.77	6.54	3.54	3.39	1.09	0.22	T	0.00	0.73	0.90	3.92	2.99	30.09
1931	M2.86	M2.40	3.74	1.63	0.38	0.84	0.00	0.00	0.19	4.17	6.32	13.81	36.34
1932	9.09	1.51	2.74	4.17	2.49	0.06	0.13	0.01	0.00	0.53	7.48	6.88	35.09
1933	10.37	2.11	12.13	1.60	4.72	0.17	0.00	T	0.39	2.17	0.47	13.49	47.62
1934	4.75	5.04	2.98	1.27	3.36	1.20	T	0.03	0.70	6.53	8.44	6.26	40.56

1935	10.13	4.00	7.12	5.38	0.16	0.13	0.01	T	0.69	3.81	2.74	7.98	42.15
1936	14.11	8.74	2.97	3.43	1.62	1.97	0.25	0.00	0.00	0.30	0.03	3.37	36.79
1937	7.33	11.17	7.98	4.30	0.57	1.24	0.00	0.09	0.06	4.28	15.15	8.52	60.69
1938	9.93	19.39	16.54	2.65	M0.41	0.00	0.00	0.00	1.10	3.53	6.14	6.96	66.65
1939	6.51	5.05	5.24	0.29	1.88	0.50	0.06	T	T	1.33	1.37	14.65	36.88
1940	8.58	14.60	6.38	0.67	1.95	0.65	0.00	0.00	1.05	3.57	2.30	17.11	56.86
1941	15.32	11.92	5.70	4.85	2.28	1.48	0.01	0.09	0.91	2.18	3.81	18.94	67.49
1942	5.94	9.39	2.32	6.33	5.41	0.27	T	0.00	0.00	1.00	10.29	8.81	49.76
1943	10.05	3.12	5.80	2.95	1.34	1.14	0.00	0.21	0.07	5.82	3.66	2.49	36.65
1944	6.16	5.42	3.25	4.06	1.88	1.44	T	0.00	0.27	3.11	9.01	8.94	43.54
1945	3.38	9.83	8.61	2.28	2.30	0.00	0.00	0.02	0.32	7.02	10.78	15.31	59.85
1946	5.06	6.69	4.44	0.75	0.79	0.07	0.19	T	0.33	1.96	7.69	1.73	29.70
1947	4.84	3.60	7.48	1.86	0.04	1.49	0.35	0.26	0.33	7.31	2.02	3.76	33.34
1948	7.30	4.72	6.77	10.19	3.39	1.49	0.03	0.15	0.88	2.11	2.92	9.65	49.60
1949	1.88	6.79	14.05	0.19	1.27	0.37	0.02	0.18	0.27	2.28	2.65	4.21	34.16
1950	13.01	6.73	7.35	2.03	1.63	0.80	0.01	0.01	0.34	14.55	4.83	7.31	58.60
1951	10.78	7.61	3.48	2.05	1.52	0.00	0.11	MT	0.23	4.82	8.93	12.91	52.44
1952	15.22	6.74	7.14	1.53	1.99	1.68	0.00	0.00	0.17	0.30	2.47	18.66	55.90
1953	13.23	2.98	8.70	3.35	5.61	1.63	0.01	0.27	0.03	3.00	10.24	M4.27	53.32
1954	16.08	7.54	6.96	3.44	0.06	1.80	0.01	1.74	0.60	1.78	6.26	10.15	56.42
1955	5.64	3.59	1.73	7.92	0.12	0.11	0.11	0.01	0.78	1.71	7.65	22.88	52.25
1956	14.43	11.37	1.82	0.72	1.70	0.98	0.04	0.00	0.00	5.76	0.44	5.73	42.99
1957	8.21	8.92	8.34	3.21	4.14	0.10	0.09	0.10	2.88	5.17	5.62	8.03	54.81
1958	11.48	21.54	8.23	6.39	1.12	1.83	0.11	0.04	M0.66	M0.43	3.79	3.77	59.39
1959	19.75	15.52	2.86	0.24	0.73	0.11	0.00	0.00	2.16	0.77	0.25	3.84	46.23
1960	6.20	10.78	6.83	2.62	M4.17	M0.00	0.00	T	0.00	1.27	8.53	7.55	47.95
1961	4.48	7.91	9.78	M2.42	M2.43	0.19	0.06	M0.19	0.40	1.73	6.60	3.60	39.79
1962	3.17	11.56	7.18	2.34	0.86	0.04	0.01	1.46	0.98	9.14	6.57	4.52	47.83
1963	2.73	7.54	9.26	12.38	2.45	0.25	0.08	0.02	0.36	5.66	8.70	2.65	52.08
1964	9.59	1.68	6.11	0.86	1.65	0.87	0.16	0.10	0.03	2.73	9.74	18.37	51.89
1965	9.50	1.78	1.20	8.77	0.18	0.28	0.00	0.15	0.00	0.39	11.25	6.79	40.29
1966	14.24	5.95	6.08	1.31	0.08	0.37	0.03	0.34	1.13	0.61	11.33	8.38	49.85
1967	10.84	1.13	12.42	4.65	1.08	0.19	T	0.00	0.85	2.75	4.96	6.48	45.35
1968	11.39	3.51	5.11	0.32	0.98	0.32	0.06	1.53	0.19	3.23	5.64	17.37	49.65

1969	16.19	13.52	2.08	3.78	0.73	0.43	0.01	0.00	0.70	1.40	3.40	14.45	56.69
1970	17.32	4.65	3.24	1.33	1.03	0.09	0.00	T	0.10	2.30	12.96	13.32	56.34
1971	8.60	3.34	7.76	3.30	0.71	0.66	0.07	0.34	1.83	1.19	10.29	11.21	49.30
1972	6.33	5.53	5.54	3.83	0.83	0.73	T	0.07	1.65	3.98	7.47		35.96
1973	10.80	7.91	6.94	1.11	0.36	0.06	0.00	T	2.41	4.49	21.53	11.21	66.82
1974	11.73	8.36	10.44	4.20	0.40	0.26	0.15	0.80	T	1.95	3.58	10.36	52.23
1975	5.86	10.77	14.78	3.61	0.72	0.34	0.08	0.60	T	8.60	4.67	5.08	55.11
1976	1.51	8.80	3.81	5.45	0.12	0.15	0.25	1.63	0.01	0.20	2.33	0.71	24.97
1977	2.53	3.43	4.90	0.67	2.89	0.16	T	0.08	3.34	2.40	6.60	9.58	36.58
1978	17.20	10.27	5.52	5.17	1.02	0.16	0.03	0.39	3.30	0.06	2.10	2.48	47.70
1979	6.31	8.69	4.89	4.93	2.87	0.05	0.11	0.25	0.39	8.68	8.14	7.35	52.66
1980	7.62	9.83	6.91	4.86	2.11	0.15	0.01	0.02	0.18	1.48	1.94	8.72	43.83
1981	12.90	4.90	5.50	1.26	1.54	0.34	0.01	0.03	1.41	5.44	13.81	10.58	57.72
1982	M6.16	6.55	11.46	8.74	0.05	0.48	0.20	0.15	0.81	6.78	8.16	15.51	65.05
1983	13.34	13.76	15.12	5.94	1.45	M0.46	0.41	3.15	0.37	1.03	16.01	17.31	88.35
1984	0.74	6.03	6.27	3.44	1.01	1.02	T	0.05	0.25	3.22	18.70	3.44	44.17
1985	0.55	3.61	6.18	0.46	0.65	0.41	0.04	0.24	1.13	3.51	2.96	4.59	24.33
1986	9.62	16.10	8.31	1.25	2.31	0.12	0.04	T	3.85	1.56	1.88	4.34	49.38
1987	6.20	5.81	12.04	0.75	1.11	0.28	0.05	0.03	0.00	1.25	4.80	18.02	50.34
1988	6.38	0.16	1.36	2.70	1.59	3.57	0.04	T	0.07	0.65	10.84	9.04	36.40
1989	4.95	2.70	10.26	2.10	1.86	0.43	0.03	0.72	1.09	5.10	1.76	0.11	31.11
1990	9.14	5.40	3.28	1.22	4.50	0.15	0.11	0.67	0.26	2.47	2.99	2.84	33.03
1991	1.40	3.66	13.33	1.79	3.29	0.35	0.97	0.05	T	2.08	2.33	3.99	33.24
1992	5.05	10.19	6.11	2.58	1.29	1.02	0.52	T	0.03	2.68	2.43	13.27	45.17
1993	10.81	7.30	3.40	5.76	5.06	1.59	0.05	0.26	T	1.36	2.10	8.66	46.35
1994	6.19	8.93	2.93	3.26	1.83	0.18	0.03	T	0.10	0.70	8.54	6.32	39.01
1995	26.41	1.65	16.07	6.67	1.69	1.25	0.17	0.05	0.30	0.39	1.10	14.82	70.57
1996	11.05	9.33	4.81	5.26	2.47	0.17	0.03	0.00	0.74	3.01	5.42	22.58	64.87
1997	12.90	3.02	2.38	2.27	0.59	1.17	0.01	0.45	0.79	2.33	9.39	5.83	41.13
1998	16.47	19.83	9.07	3.56	4.70	0.20	0.10	0.01	0.01	1.98	11.99	6.04	73.96
1999	4.72	13.30	10.16	2.71	1.08	0.06	T	0.22	T	2.32	9.17	4.59	48.33
2000	10.11	11.79	2.54	2.62	1.64	0.51	0.03	0.01	0.39	3.49	3.16	3.17	39.46
2001	7.14	6.65	5.02	3.12	0.23	0.68	0.08	0.08	0.11	1.44	9.41	12.45	46.41
2002	6.35	3.88	4.84	2.74	0.83	0.04	0.02	T	0.08	0.02	5.02	27.44	51.26

2003	5.13	4.23	7.38	13.95	1.27	0.10	0.01	0.13	0.30	0.20	4.98	12.90	50.58
2004	8.02	14.41	2.72	1.33	1.45	0.06	0.00	0.21	M0.25	6.46	1.85	9.92	46.68
2005	7.60	3.98	8.36	5.96	4.64	2.77	0.01	0.00	0.03	1.48	7.32	M18.79	60.94
2006	11.66	6.65	15.20	5.21	1.46	0.14	0.01	0.00	0.24	0.55	7.65	9.46	58.23
2007	1.70	12.31	2.91	3.61	0.82	0.46	0.67	0.02	0.31	3.62	1.89	10.72	39.04
2008	14.64	5.13	2.35	2.38	0.05	0.24	0.02	M0.00			6.38	5.39	36.58
2009	1.94	10.05	M5.88	1.31	2.76	0.06	0.02	0.01	0.45	4.33	4.59	4.58	35.98
2010	16.23	6.20	5.53	7.97	3.21	1.55	0.00	0.17	0.53	4.16	4.94	14.02	64.51
2011	M1.12	5.70	M15.08	3.89	M2.34	1.11	0.24	0.01	0.19	M2.82	4.29	1.07	37.86
2012	M6.47	4.20	13.39	M3.84	0.91	1.03	0.76	0.02	0.00	M2.24	M8.66	14.44	55.96
2013	3.02	1.47	M3.45	1.61	M0.87	M0.37	0.00	M0.50	3.78	M0.03	M0.88	0.64	16.62
2014	0.87	M4.19	7.25	M0.94	M0.81	M0.18	0.06	0.00	2.46	5.60	M3.99	11.67	38.02
2015	1.22	11.92	2.30	3.66	0.33	M0.02	0.19	M0.28	0.50	0.68	4.85	14.81	40.76
2016	15.17	3.45	M12.25	M2.74	1.36	0.07	0.06	T	0.06	M10.39	8.19	7.32	61.06
2017	M16.33	M16.84	M7.80	M6.84	M1.01	M0.46	0.11	M0.00	0.56	M0.98	6.58	1.21	58.72
2018	M7.38	M3.01	8.90	4.00	M0.90	0.27	0.00	0.02	0.47	1.24	5.70	6.26	38.15
2019	10.80	17.62	6.66	2.98	4.78	0.00	0.03	M0.19	1.00	0.76	2.04	11.06	57.92
2020	8.01	0.74	2.34	1.86	3.72	0.49	0.00	0.05	0.29	0.14	2.94	3.95	24.53
2021	9.50	5.08	4.88	0.66	0.22	0.30	0.08	0.00	0.76	4.57	3.39	9.25	38.69
2022	2.14	0.63	M1.07										3.84
Notes: Data missing in any month have an "M" flag. A "T" indicates a trace of precipitation.													
Data missing for all days in a month or year is blank.													

Creation date: 2022-03-24