Appendix B2. Aquatic Resources Delineation Report

Moraga-Oakland X 115 kV Rebuild Project, Contra Costa and Alameda Counties, California

Aquatic Resources Delineation Report

July 2024

Pacific Gas and Electric Company

Moraga-Oakland X 115 kV Rebuild Project, Contra Costa County, California

Project No:	D31321AC
Document Title:	Aquatic Resources Delineation
Document No.:	Report 240131125413_48895a10
Date:	July 2024
Client Name:	Pacific Gas and Electric Company
Project Manager:	Colleen Taylor
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File Name:	PGE MOX ARDR DRAFT

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Acronyms and Abbreviations

APT	Antecedent Precipitation Tool
CMP	corrugated metal pipe
EBRPD	East Bay Regional Park District
HUC	Hydrologic Unit Code
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
OHWM	ordinary high water mark
PG&E	Pacific Gas and Electric Company
project	Moraga-Oakland X 115 Kilovolt Rebuild Project
RN	Rebuild North
RS	Rebuild South
SP	sample point
Study Area	biological study area for aquatic resources
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

1. Introduction

This report presents the methods and results of an aquatic resource delineation completed for the Moraga-Oakland X 115 kV Rebuild Project (project) located in Alameda and Contra Costa counties. Results and conclusions presented in this report are considered preliminary, pending verification by the U.S. Army Corps of Engineers (USACE) Regulatory Branch. The project overview, location, environmental setting, and survey methods and results are provided in the following sections.

1.1 Project Overview

The project will upgrade and rebuild four overhead 115 kilovolt (kV) power lines into hybrid lines in the Oakland Hills of Contra Costa and Alameda Counties. The project will span approximately 5 miles between Pacific Gas and Electric Company's (PG&E's) Moraga and Oakland X substations. The two existing double circuit lines will be rebuilt as hybrid lines, meaning the upgraded double circuit lines between the two substations will have both overhead and underground sections. Existing line towers and poles and existing conductors will either be replaced with overhead rebuild or underground components, and minor modifications will occur within the existing substations. Four transition structures will be installed to support the connection between the overhead and underground portions of each line, and another three transition structures will be installed to connect the underground portion into Oakland X Substation. Approximately 1 mile of existing overhead lines and structures will be removed where the lines are rebuilt underground. Additionally, the rebuild will include the installation of optical guide wire on aboveground structures with a communication path continuing within the underground portions.

1.2 Project Location

The project will be located within the City of Orinda, unincorporated Contra Costa County, and the cities of Piedmont and Oakland (Figure 1). Existing land uses in the project area include utility, open space in the City of Orinda and unincorporated Contra Costa County, and residential, parks, churches, and schools, as well as some commercial land within the cities of Piedmont and Oakland. The project is located within Sections 9, 10, 14, 15, and 16, Township 1 south, Range 3 west of the Mount Diablo Baseline and Meridian, as well as the Laguna de Los Palos Colorados and Rancho San Antonio land grants. The project is within the Oakland East (3712272) 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle.

A study area for the aquatic resources delineation was established as a 10-foot-wide buffer on either sides of the proposed access routes and a 100-wide buffer around all other potential work areas (including new proposed structure locations, staging areas, and new proposed substations) (Figure 2). The aquatic resource delineation study area (Study Area) encompasses approximately 226.3 acres.

2. Environmental Setting

2.1 Regional Setting

The Study Area is situated in the East Bay Hills – Mount Diablo and East Bay Terraces and Alluvium subsections of the Central California Coast section (USDA 1997). The East Bay Hills is a vaguely defined section of the Coast Ranges east of San Francisco Bay. The Study Area lies within the San Leandro Creek and Sausal Creek Watersheds. Ten tributary creeks in the San Leandro Creek Watershed drain to Upper San Leandro Reservoir, Lake Chabot, or San Leandro Creek. Within the Sausal Creek Watershed, three main tributaries flow to the Sausal Creek, which ultimately drains into the Oakland Estuary.

2.2 Project Setting

2.2.1 Land Use

From the eastern end of the proposed project at the existing PG&E Moraga Substation on Lost Valley Drive in Orinda, the upgraded lines would follow an approximately 5-mile-long southwestward path with an approximately 100- to 250-foot-wide right-of-way that currently terminates into the existing PG&E Oakland X Substation. The right-of-way passes through several planning jurisdictions, including the City of Orinda, Contra Costa County, the City of Piedmont, and the City of Oakland. In addition, the East Bay Regional Park District (EBRPD) and East Bay Municipal Utility District own and have jurisdiction over lands in unincorporated Contra Costa County and engage in land use planning activities. The botanical resources survey report includes further discussion on land use in the Study Area (Nomad 2022).

2.2.2 Vegetation Types and Land Cover

The majority of undeveloped upland areas in the Study Area is oak woodland and nonnative annual grassland. The western portion of the Study Area, roughly west of Skyline Boulevard, is either hardscaped (pavement and sidewalks) or otherwise developed and landscaped, and disturbed habitat composed of primarily ruderal or nonnative species (Figure 1). Holland (1986) and Holland and Keil (1995) provide a generalized natural community-level description for the natural communities present within the Study Area. Both natural communities and land cover types were mapped as part of the botanical resources survey and are described in the survey report (Nomad 2022). Vegetation associated with the aquatic features identified during the aquatic resources delineation are described in the following sections.

2.2.2.1 Wetlands

Wetlands in the Study Area, synonymous with freshwater seeps mapped by Nomad (2022), were dominated by herbaceous species such as tall flatsedge (*Cyperus eragrostis*), rabbit's foot grass (*Polypogon monspeliensis*), spreading rush (*Juncus patens*), Hyssop loosestrife (*Lythrum hyssopifolium*), seep monkeyflower (*Mimilus guttatas*), and sedges (*Carex sp.)*. More details on these wetlands can be found in Section 4.2.1.

2.2.2.2 Riverine Waters

Riverine waters within the Study Area include intermittent drainages such as Shephard Creek and Palo Seco Creek and ephemeral drainages including a concrete lined ditch and a constructed drainage. Vegetation within the creeks and along the creek banks was variable, but predominantly includes species such as tall flatsedge, perennial ryegrass (*Festuca perennis* [*Lolium perenne*]), Himalayan blackberry

(*Rubus armeniacus*), Pacific poison oak (*Toxicodendron diversilobum*), and curly dock (*Rumex crispus*). More details on these aquatic features can be found in Section 4.2.2.

2.2.2.3 Riparian

Within the Study Area, riparian habitat is present in mesic depression in Shepherd Canyon and an area where the access road to the staging area nearon Wilder Roadcrosses an ephemeral drainage (Figure 1). Riparian habitat was mapped as central coast riparian scrub during the 2021 botanical resources surveys (Nomad 2022). It is dominated by arroyo willow (*Salix lasiolepis*) in the shrub layer with poison oak present and low cover of California bay (*Umbellularia californica*). Although the herbaceous layer was largely absent, mugwort (*Artemisia douglasiana*), tall flatsedge, Harding grass (*Phalaris aquatica*), and small amounts of creeping wildrye (*Elymus triticoides*) are present at the edges of this layer.

Geology and Soils

Soils information for the Study Area was obtained from the Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2023a) as well as the Official Soil Series Descriptions (NRCS 2023b). Figure 3 presents the soil types within the Study Area and Table 1 presents additional information about the mapped soil series.

2.2.3 Climate and Precipitation

The regional climate is characterized by mild winters and hot, dry summers. Average total precipitation is 23 inches (AgACIS 2023). Monthly temperature ranges from 52 to 67 degrees Fahrenheit with an annual average of 59.5 degrees Fahrenheit. Historical weather data were collected from the Oakland Museum National Oceanic and Atmospheric Administration weather station, which was the closest and most appropriate station that collects precipitation and temperature data (WRCC 2023).

Hydrology

The majority of the Study Area is located within the San Lorenzo Creek – Frontal San Francisco Bay Estuaries watershed (Hydrologic Unit Code [HUC] 1805000408) with a small portion in the northwestern section of the Study Area located in the San Pablo Creek – Frontal San Pablo Bay Estuaries watershed (HUC 1805000407). Both watersheds are within the larger San Pablo Bay watershed (HUC 18050002).

Hydrology in the Study Area is influenced by precipitation, surface water runoff, groundwater discharge, geologic stratigraphy, topography, and soil permeability. A total of six intermittent drainages in the Study Area are identified on the 7.5-minute USGS topographic quadrangles, including Palo Seco Creek, San Leandro Creek, Sausal Creek, Shepherd Creek, West Branch Creek, and San Pablo Creek. The portion of the Study Area east of Gudde Ridge drains into San Pablo Creek, flowing southeast through Moraga Valley before entering San Leandro Reservoir to the southeast. San Leandro Creek drains the Study Area between Gudde Ridge and Manzanita Drive and flows south-southeast into San Leandro Reservoir. Shepherd Creek drains the upper Berkeley Hills east of State Route 13 via Shepherd Canyon and flows southwest into Sausal Creek at State Route 13. Sausal Creek flows south-southwest out of the Berkeley Hills through Dimond Canyon and ultimately drains into the Oakland Estuary near Alameda Island.

Table 1. Mapped Soil Series within the Study Area and Vicinity

Type / Series	Texture	Landscape Position and Parent Material	Drainage and Permeability	Hydric Soil?
Cropley	Clay	Cropley soils are on valleys. Parent material is alluvium.	Moderately well drained; medium runoff	No
Diablo	Clay	Diablo soils are on mountain slopes and hillslopes. The soils formed from residuum weathered from calcareous shale.	Well drained; very high runoff	No
Lodo	Clay loam	Lodo soils are on mountain slopes and hillslopes. The soils formed from residuum weathered sandstone and shale.	Somewhat excessively drained; very high runoff	No
Los Osos	Clay loam	Los Osos soils are on mountain slopes and hills. The soils formed from residuum weathered from sandstone and shale.	Well drained; very high runoff	No
Maymen	Loam	Maymen soils are on hills. The soils formed from residuum weathered from sedimentary rock.	Somewhat excessively drained; very high runoff	No
Maymen-Los Gatos complex	Loam	Maymen-Los Gatos soil complex are on hills. The soils formed from residuum weathered from sedimentary rock.	Somewhat excessively drained to well drained; very high runoff	No
Millsholm	Loam	Millsholm soils are on hillslopes. The soils formed from loamy residuum weathered from sandstone and shale.	Well drained; very high runoff	No
Urban land-Danville complex	Clay loam	Urban land-Danville soil complex is on alluvial fans and fan terraces. The soils formed in alluvium derived mainly from sedimentary rock.	Well drained; low runoff	No
Urban land-Tierra complex	Loam	Urban land-Tierra soil complex is on fan terraces. Parent material are mainly alluvium.	Moderately well drained; very high runoff	No
Xerothents-Los Osos complex	Clay loam	Xerothents-Los Osos soils complex is on hills. The soils formed from residuum weathered from sedimentary rock.	Well drained; very high runoff	No
Xerothents-Millsholm complex	Silt loam	Xerothents-Millsholm soils complex is on hills. The soils formed from residuum weathered from sandstone and shale.	Well drained; very high runoff	No

Source:

Web Soil Survey 2.0 National Cooperative Soil Survey (NRCS 2023a)

3. Methods

3.1 Pre-field Investigation

General information on climate, vegetation, soils, hydrology, and existing wetlands was reviewed before the field survey. The following materials were included in this data review:

- NRCS's *Web Soil Survey* (soil maps and descriptions) (NRCS 2023a and 2023b) (Figure 3)
- USGS's topographic quadrangle maps (Figure 1)
- USGS's *National Hydrography Dataset* (NHD) (USGS 2023) (Figure 4)
- U.S. Fish and Wildlife Service *National Wetlands Inventory* (NWI) (USFWS 2022) (Figure 4)
- Satellite imagery (Google Earth 2023)

3.2 Field Survey

The aquatic resource delineation survey was conducted by two Jacobs wetland scientists, Kevin Fisher and Pim Laulikitnont-Lee, on December 12, December 28, December 29, 2023, and January 12, 2024. The aquatic resource delineation survey included all potentially jurisdictional aquatic features within the Study Area. Where the Study Area was not safely accessible or extended outside of parcels with approved permit to enter, surveys were conducted visually from accessible areas, along with a review of aerial images, public databases, and available topographic data. Specific survey methodology is provided in the following sections.

The aquatic resource delineation survey methodology followed the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), the ordinary high water mark (OHWM) *Regulatory Guidance Letter No. 05-05* (USACE 2005), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0* (USACE 2008), *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008), and the *Interim Draft Rapid Ordinary High Water Mark (OHWM) Field Identification Data Sheet* (USACE 2022). Wetland indicator statuses for plants were taken from *The National Wetland Plant List*, version 3.5 (USACE 2020).

The locations of wetland sample points, OHWM transects, and the boundaries of aquatic resources were mapped in the field with a global positioning system receiver with sub-meter accuracy. Several wetland sample points were collected to document the absence of aquatic features mapped by the NWI or NHD (sample point [SP] 1, SP-2, and SP-6). Geographic information system software (ArcGIS 10.5) was used to process the collected geodata for developing aquatic resource maps. Cowardin classification codes were assigned to aquatic resources based on guidance from Cowardin et al. (1979).

3.2.1 Identification of Wetlands

The USACE uses the three-parameter approach (vegetation, soils, and hydrology) to determine the presence of wetlands. As a general rule, under this method, evidence of a minimum of one positive indicator for each parameter must be found (under normal circumstances and in nonproblem areas) to make a positive wetland determination. Wetland data points were collected according to USACE standards where apparent vegetation, hydrology patterns, and soil moisture gradients indicated that there is the potential for wetlands to occur. Wetland determination data forms are included in Appendix A.

3.2.2 Identification of Other Waters of the U.S.

Riverine aquatic resources were delineated based on guidance provided in USACE *Regulatory Guidance Letter 05-05* (USACE 2005) and *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008). The following physical characteristics were considered when making OHWM determinations:

- Natural line impressed on the bank
- Shelving

Changes in the character of the soilm

- Destruction of terrestrial vegetation
- Wracking
- Vegetation matted down, bent, or absent
- Sediment sorting
- Leaf litter disturbed or washed away
- Scour
- Deposition
- Bed and banks
- Water staining
- Changes in plant community or cover

OHWM data sheets are included in Appendix A.

4. Results

4.1 Hydrologic Conditions at the Time of the Survey

The USACE Antecedent Precipitation Tool (APT) was used to define precipitation conditions over the period of time preceding the December 2023 and January 2024 delineation surveys, and data were collected for a location at the approximate center of the Study Area. Regional precipitation in the months preceding the surveys was considered to be drier than normal based on the APT data (Appendix A). The data, according to the Palmer Drought Severity Index, indicate incipient wetness conditions (Dai 2019).

Although hydrologic conditions were drier than normal for the survey dates, this did not appear to influence the extent of aquatic resources or the surveyor's ability to delineate boundaries. Surveys were able to rely on the distribution of relatively persistent indicators (for example, hydric soils, hydrophytic vegetation, and OHWMs) to delineate the boundaries of aquatic resources. Furthermore, the region was not in drought conditions and the survey was conducted in the wet season.

4.2 Aquatic Resources

The field delineation identified aquatic resources mostly along the proposed project's access routes; however, several aquatic resources were identified adjacent to or within proposed work and staging areas (Figure 5). The aquatic resource delineation identified five wetlands comprising approximately 0.133 acre, approximately 0.357 acre (approximately 1,748 linear feet) of riverine – intermittent waters, approximately 0.029 acre (approximately 465 linear feet) of riverine – ephemeral waters, and approximately 1,514 linear feet of culverted waters in the Study Area.

Table 3 presents an overview of the types and amounts of potential jurisdictional waters in the Study Area, and descriptions of the delineated features are presented in the following paragraphs. The delineated aquatic resources are shown in Figure 5. USACE wetland and OHWM data sheets are presented in Appendix B, and representative photographs are presented in Appendix C.

4.2.1 Wetlands

A total of five wetlands were delineated within the Study Area (Table 3, Figure 5). A wetland complex consisting of three separate features (W-01a, W-01b, and W-01c) was delineated along Edgewood Road east of the proposed staging area on Wilder Road. These wetlands are formed from groundwater discharge at the base of a hillslope. Local topography is flat to slightly concave. Two wetlands (W-02 and W-03) were delineated on hillslopes adjacent to the proposed staging area just southeast of the proposed overhead structures Rebuild North (RN) 8 and Rebuild South (RS) 9. Wetland hydrology appeared to be associated with hillslope seeps. The local topography was flat to slightly convex. A total of approximately 0.133 acre of wetlands were delineated within the Study Area.

4.2.2 Other Waters

4.2.2.1 Riverine – Intermittent

Ten riverine – intermittent waters were delineated within the Study Area. A break in the bank slope and changes in species cover and composition were the most common indicators of the OHWM used in the delineation (Lichvar and McColley 2008). One of the riverine – intermittent waters, Alder Creek, was recently daylighted and restored on EBRPD property along Fire Trail 61-16 off Pinehurst Road (Figure 4).

Riverine – intermittent waters delineated within the Study Area total approximately 0.357 acre and approximately 1,748 linear feet.

4.2.2.2 Riverine – Ephemeral

Five riverine – ephemeral waters were delineated within the Study Area. These ephemeral waters cross many parts of the Study Area, draining water from surrounding hillslopes in the upper watersheds. Ephemeral flow regime was distinguished from intermittent flow regime primarily based on stream order, channel slope, and presence/absence of flow following recent storm events. Riverine – ephemeral waters delineated within the Study Area total approximately 0.029 acre and approximately 465 linear feet.

4.2.2.3 Culverted Waters

"Culverted waters" are piped connections between upstream and downstream segments of potentially jurisdictional waters. Ten culverted water features were mapped within the Study Area. These features convey potential waters of the U.S. under roadway and access routes. A total of 1,514 linear feet of culverted waters were delineated within the Study Area.

4.3 Other Areas Investigated

SP-1 was established east of Moraga Substation (Figure 5, Map 2; Appendix C, Photo 4). The area was dominated by hydrophytes including poison hemlock (*Conium maculatum)* and spreading rush. However, there was no evidence of hydric soils or wetland hydrology; therefore, no aquatic resources were delineated at this location and the feature was determined to be an upland swale.

SP-2 was established in a swale east of Moraga Substation just north of SP-1 (Figure 5, Map 2; Appendix C, Photo 5). The area was dominated by hydrophytes including spreading rush and beardless wild rye (*Elymus triticoides*). However, there was no evidence of hydric soils or wetland hydrology; therefore, no aquatic resources were delineated at this location and the feature was determined to be an upland swale.

Seven stormwater basins were investigated along Alder Creek (R-8 and R-9) and the access route at the EBRPD Wilcox Station Staging Area (Figure 5, Map 12 and 13). These stormwater basins were constructed as part of the Alder Creek Restoration Project and were determined to be part of the Best Management Practices measures of the restoration project. Therefore, no aquatic resources were delineated.

Table 2. Aquatic Resources Delineated within the Biological Study Area

Feature ID	Cowardin Code[a]	Latitude, Longitude	Approximate Area (acres)	Length (linear feet)	Figure 5 Mapbook Page	Description
WETLANDS						
Wetlands						
W-01a	PEM	37.852134, -122.170409	0.035	-	4	Wetlands W-01a, W-01b, and W-01c are three separate features that form a wetland complex (Appendix C, Photo 8). This wetland complex was delineated along Edgewood Road east of the proposed staging area on Wilder Road. These wetlands are situated on flat to slightly concave terrain. They are formed by groundwater discharge at the base of a hillslope. Vegetation was dominated by tall flatsedge and soils met the Depleted Matrix (F3) hydric soil indicator. Wetland hydrology present were Saturation (A3) and Oxidized Rhizospheres along Living Roots (C3).
W-01b	PEM	37.852097, -122.170484	0.015	-	4	
W-01c	PEM	37.852314, -122.170912	0.045	-	4	
W-02	PEM	37.843238, -122.177197	0.010	-	7	Wetlands W-02 and W-03 are seep wetlands formed on hillslopes adjacent to the proposed staging area just southeast of the proposed overhead structures RN8 and RS8. (Appendix C, Photo 9 and 10). Wetland hydrology appeared to be associated with hillslope seeps; feature W-02 appeared to have remnants of a livestock watering system. The local topography was flat to slightly convex. Surface water (A1) and Saturation (A3) were the wetland hydrology indicators present at both wetlands. Vegetation was dominated by tall flatsedge and rabbit's foot grass and soils met the Redox Dark Surface (F6) hydric soil indicator.
W-03	PEM	37.842856, -122.177209	0.028	-	7	
Approximate Total Wetlands			***0.133***	-		
OTHER WATERS						
Riverine Intermittent						
R-1	R4SB	37.849133, -122.160615	0.0041	51	1	R-1 is part of San Pablo Creek and is approximately 30 feet wide at OHWM.

Feature ID	Cowardin Code[a]	Latitude, Longitude	Approximate Area (acres)	Length (linear feet)	Figure 5 Mapbook Page	Description
R-2	R4SB	37.846936, -122.161852	0.042	189	1	Stream approximately 8 feet wide at OHWM. The open channel ends southwest of Moraga Substation and becomes culverted (feature CW-1) under the substation.
R-4	R6	37.850397, -122.169449	0.003	21	4	Stream is approximately 8 feet wide at OHWM. The channel has filled with sediment in some places. It is culverted under (feature CW-3). (Appendix C, Photo 6).
R-5	R4SB	37.854921, -122.176605	0.008	40	5	Stream is approximately 11 feet wide upstream of the bridge and tapers to 5 feet in the downstream section.
R-8	R4SB	37.843351, -122.180463	0.028	79	8	R-8 and R-9 are part of the recently daylighted and restored Alder Creek that drains into San Leandro Creek (Appendix C, Photo 11 and 12). R-8 is approximately 14 feet wide and R-9 is approximately 12 feet wide at the OHWM.
R-9	R4SB	37.840788, -122.181186	0.011	40	8	
R-10	R4SB	37.835736, -122.191000	0.006	83	10	Stream is approximately 3 feet wide on a hillslope, draining to CW-7 and into Shephard Creek (Appendix C, Photo 13). The feature was not mapped by the NHD but NWI identified the feature as a riverine, intermittent, streambed.
R-12	R4SB	37.825569, -122.201999	0.064	608	12	Stream is identified by the NHD as Shephard Creek. The width of this drainage varies from 3 to 7 feet wide at the OHWM (Appendix C, Photo 16). This feature is not mapped on NWI.
R-13	R4SB	37.821866, -122.205169	0.067	243	13	Stream is tributary to Shephard Creek. Approximately 12 feet wide (Appendix C, Photo 17) at OHWM. The stream is identified by the NWI as a riverine, intermittent, streambed feature but is not identified by the NHD.
R-14	RS4SB	37.818747, -122.207186	0.087	394	14	Stream is approximately 8 feet wide at the OHWM. Stream is identified by the NHD as two blueline streams, Palo Seco Creek and Shephard Creek, and NWI identifies the feature as riverine, intermittent, streambed (Appendix C, Photo 18 and 19). The southeastern portion of the stream is part of Palo Seco Creek associated with CW-8 that drains into Sausal Creek.

Feature ID	Cowardin Code[a]	Latitude, Longitude	Approximate Area (acres)	Length (linear feet)	Figure 5 Mapbook Page	Description
Approximate Total Riverine Intermittent Waters			***0.357***	***1,748***		
Riverine Ephemeral						
R-3	R6	37.849395, -122.163269	0.015	171	1	This is a small tributary of San Pablo Creek. Stream is approximately 6 feet wide at OHWM. It is culverted under a dirt road crossing (feature CW-2).
R-6	R6	37.849235, -122.174658	0.002	26	3	Stream is approximately 2 feet wide at OHWM. The channel appears to be disturbed and not defined across the road (Appendix C, Photo 7).
R-7	R6	37.845214, -122.177123	0.002	15	7	This is a steep drainage downstream of CW-6. There is erosion and scour at the culvert outlet causing the channel to be over-widened in the Study Area.
R-11	R6	37.827073, -122.203331	0.009	203	12	Stream is approximately 3 feet wide at OHWM. It is a constructed drainage with defined bed and bank adjacent to a managed native plant garden dominated by spreading rush (Appendix C, Photo 14). The drainage ends and dissipates to sheetflow along the trail (Appendix C, Photo 15).
R-15	R6	37.816887, -122.209666	0.001	50	14	Feature is in a 1-foot-wide concrete-lined ditch draining that conveys flow to CW-10 (Appendix C, Photo 20).
Approximate Total Ephemeral Riverine Waters			***0.029***	***465***		
Culverted Waters						
CW-1	R4r	37.847694, -122.160625	-	771	1	Culvert conveys flow from R-2 through Moraga Substation then drains into San Pablo Creek.
CW-2	R6r	37.849553, -122.163171	-	13	1	Culvert conveys flow from R-3 through a 24-inch corrugated metal pipe (CMP) then drains into San Pablo Creek.
CW-3	R4r	37.850393, -122.169473	-	19	4	Culvert conveys flow from R-4 through a 36-inch CMP which then drains into San Pablo Creek.

Feature ID	Cowardin Code[a]	Latitude, Longitude	Approximate Area (acres)	Length (linear feet)	Figure 5 Mapbook Page	Description
CW-4	R4r	37.851675, -122.170047	-	57	4	Culvert conveys waters outside of the Study Area through a corrugated high-density polyethylene pipe through the Study Area into San Pablo Creek.
CW-5	R6r	37.853855, -122.17256	-	51	4	Culvert conveys waters outside of the Study Area through a 36-inch CMP through the Study Area into San Pablo Creek.
CW-6	R6r	37.845174, -122.177058	-	30	7	Culvert conveys water flow into R-7 through a 24-inch CMP.
CW-7	R4r	37.835575, -122.191000	-	39	10	Culvert receives surface flow downstream from R-10 into a box culvert draining into Shephard Creek.
CW-8	R4r	37.818633, -122.208159	-	72	14	Culverted section of R-14.
CW-9	R4r	37.818544, -122.208159	-	370	14	Culvert conveys flow from R-14 through a box culvert that drains southwest to Sausal Creek.
CW-10	R6r	37.816962, -122.209893	-	92	14, 15	Culvert receives flow from R-15 (concrete lined ditch) and drains towards Sausal Creek.
Approximate Total Culverted Waters			-	***1,514***		

[a] Source: Cowardin et al. 1979

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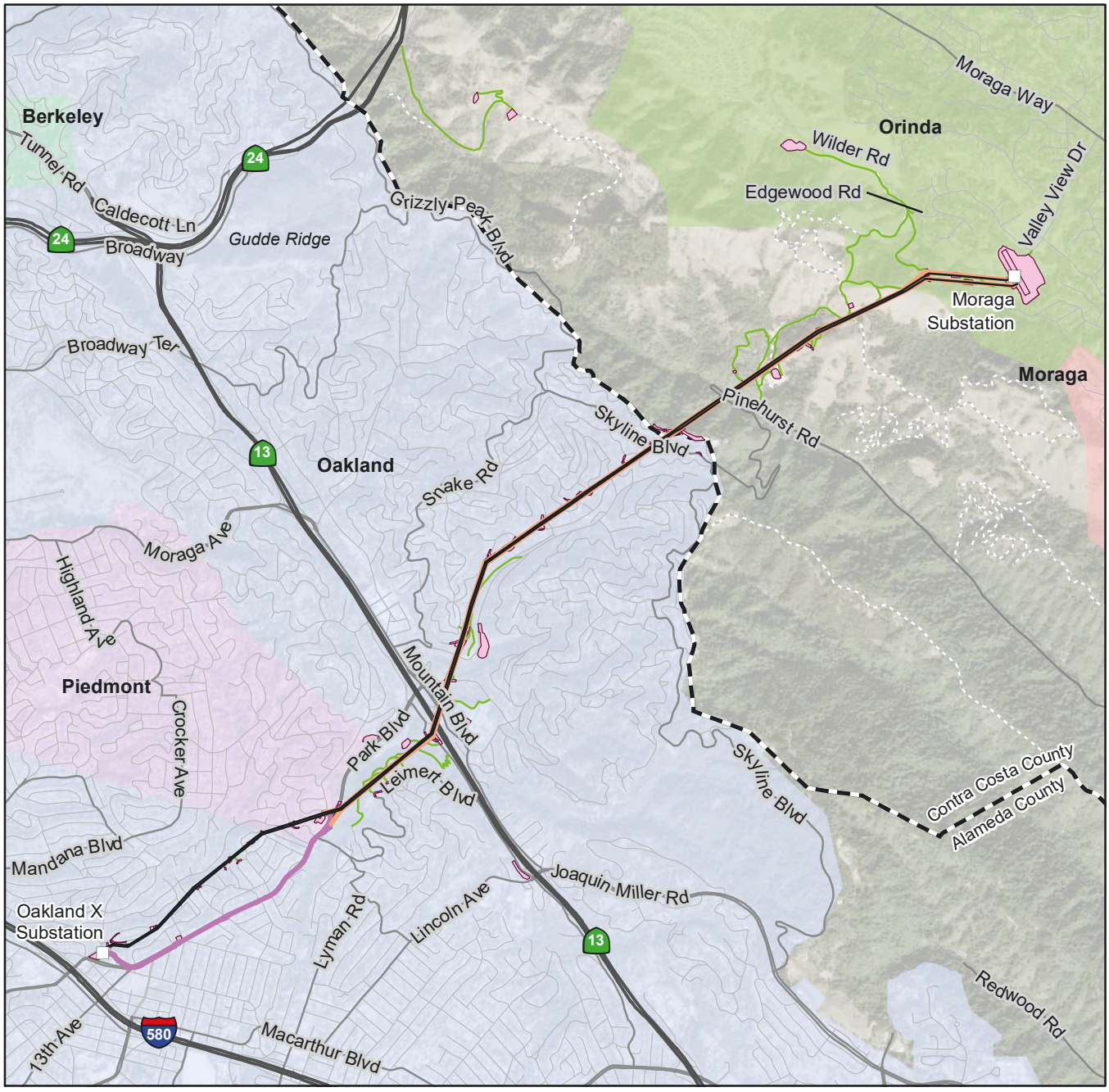
Figures



Version: 2/1/2024

Legend

- Substation
- Project Access
- Temporary Work Area

Overhead Routes

- Existing
- Proposed

Underground Routes

- Proposed

- Interstate/Highway
- Major Road
- Road
- Unpaved Road
- County Boundary
- City of Berkeley
- City of Moraga
- City of Oakland
- City of Orinda
- City of Piedmont

N

0 0.5 1
Miles

Figure 1
Project Location
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Jacobs

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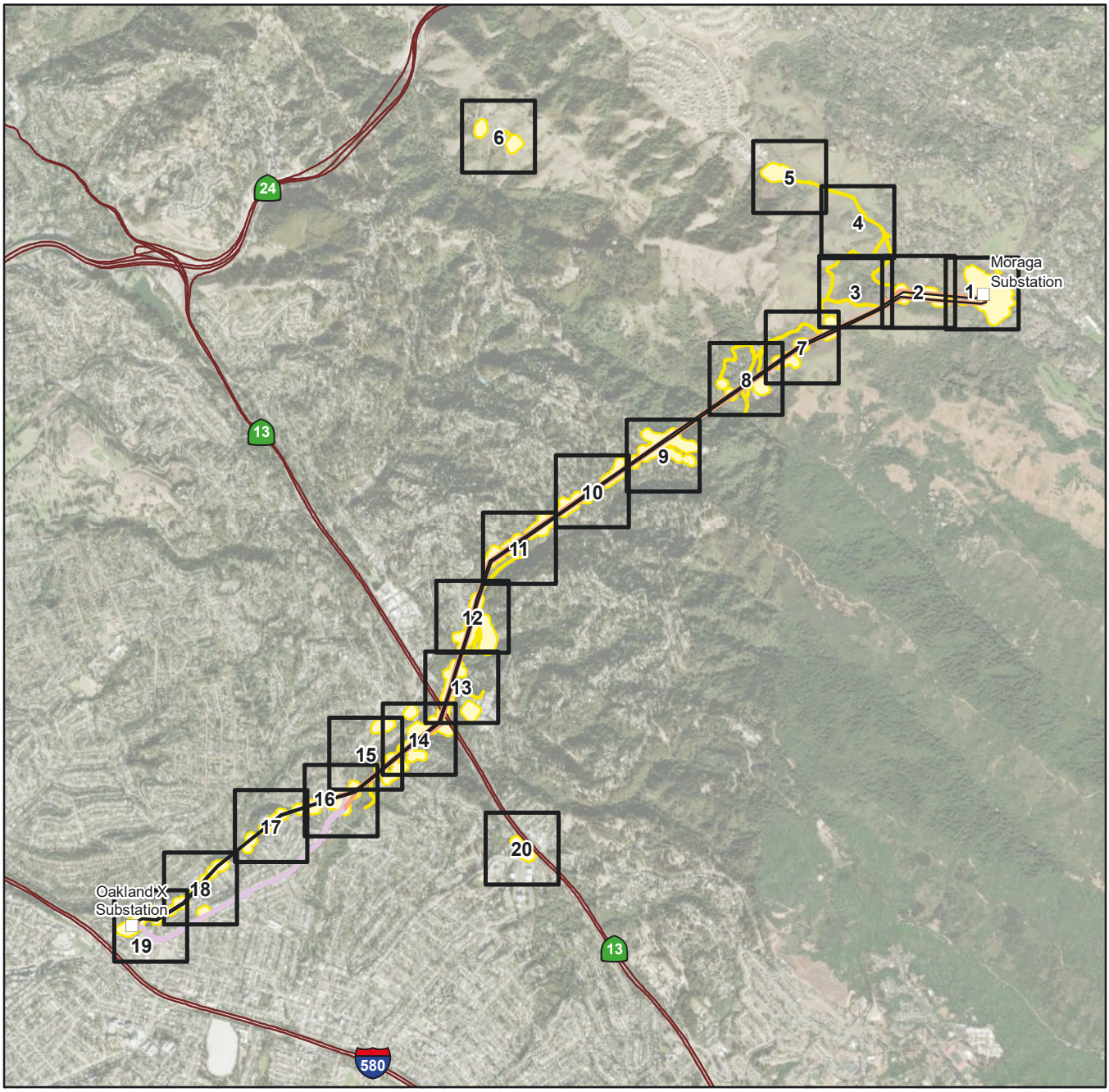

Version: 7/25/2024

Legend

- Detail Map Sheet
- Aquatic Resources Study Area (226.3 acres)
- Substation

Overhead Routes

- Existing
- Proposed

Underground Routes

- Proposed

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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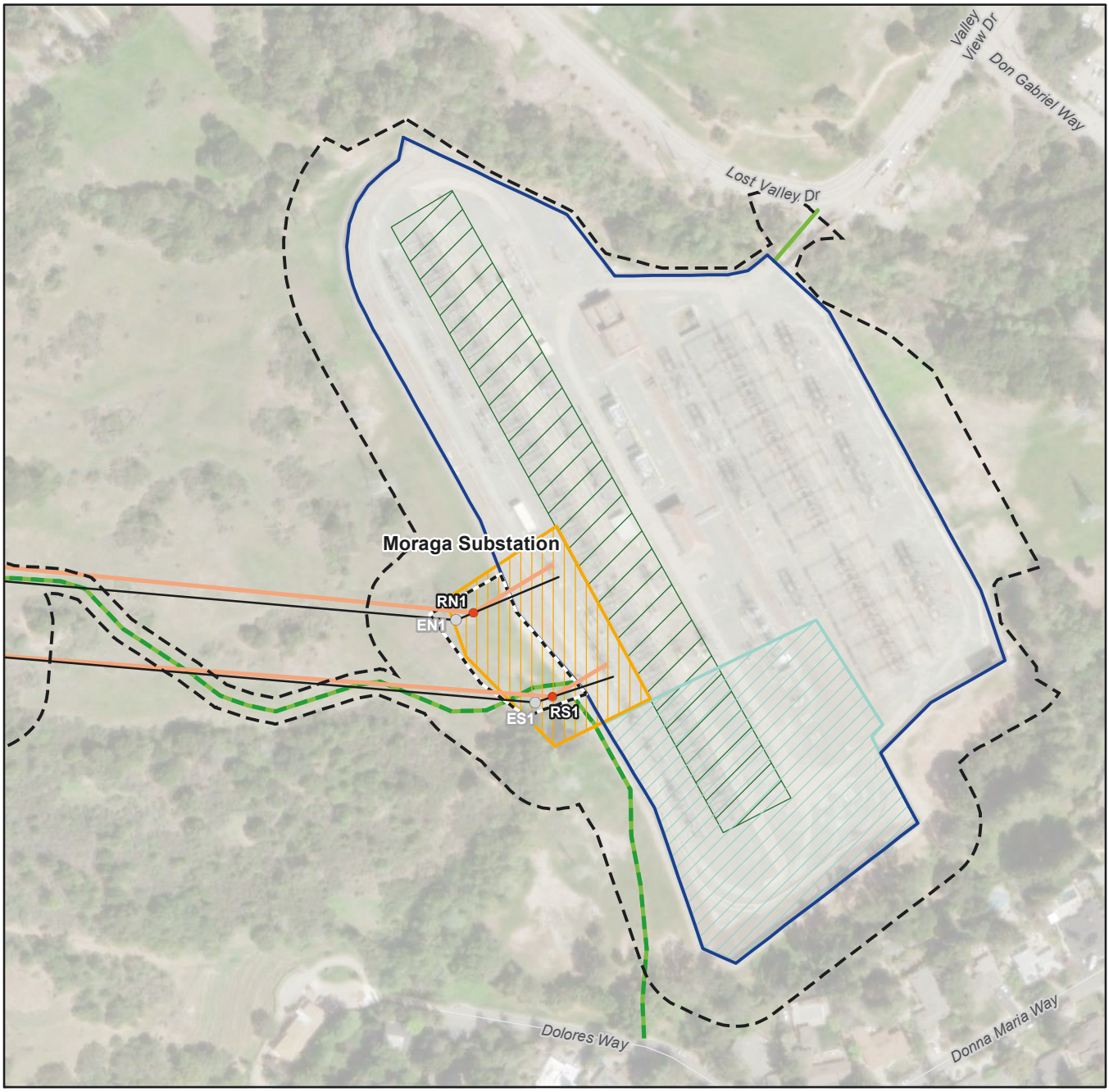
Miles

Figure 2 Overview
Project Elements and
Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs



Version: 7/25/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Access

- Existing
- Improvement

Temporary Work Areas

- Moraga Substation 115 kV Breaker Work Area
- Staging Area
- Substation Work Area
- Tension Pull Site
- Work Area

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

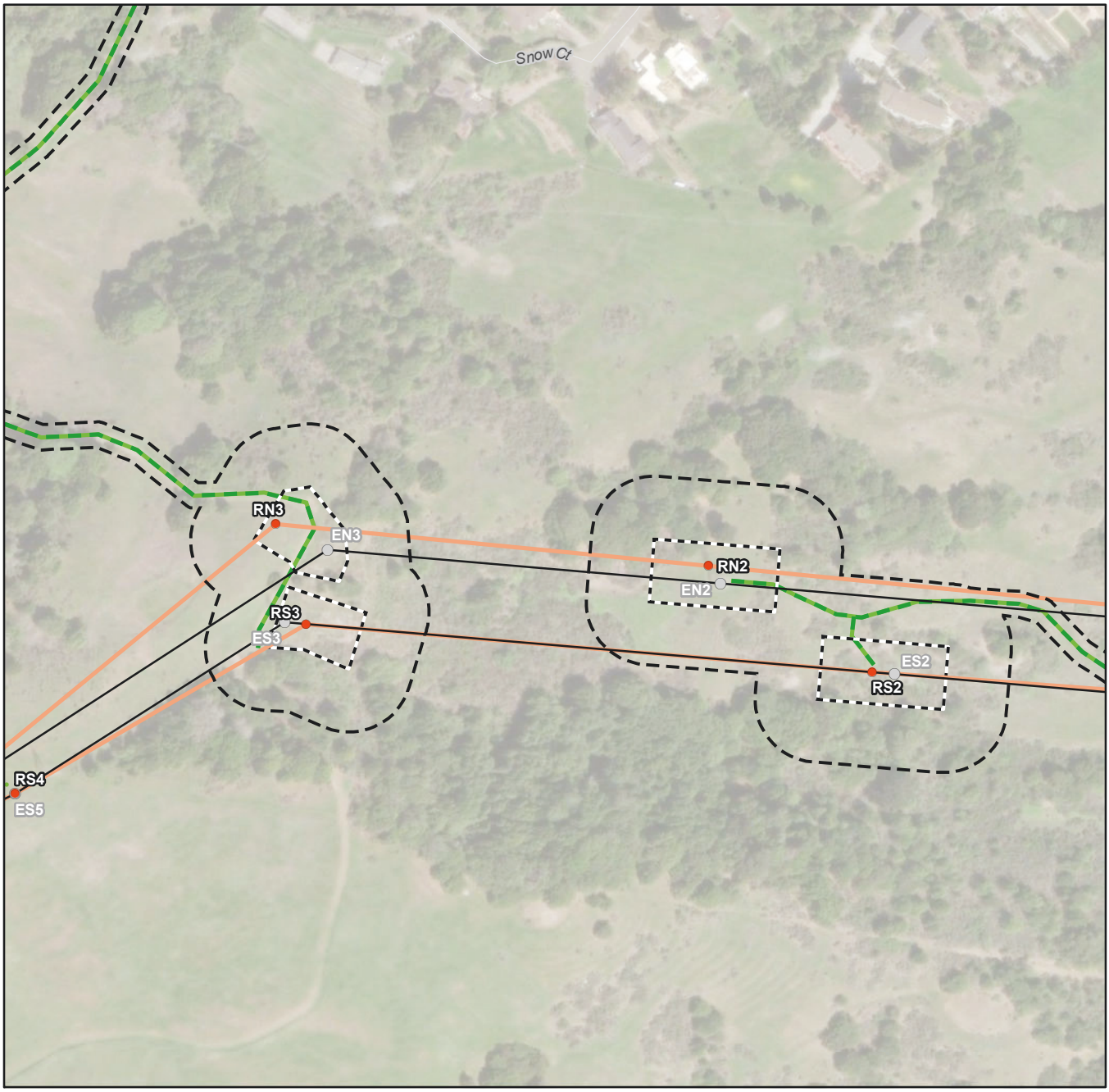
N

0 250 500

Feet

Figure 2 Page 1 of 20
Project Elements and Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs



Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Access

- Improvement
- Walk-In

Temporary Work Areas

- Work Area

Version: 7/25/2024

Preliminary and Subject to Change
Based on CPUC Requirements,
Final Engineering, and Other Factors

N

0 250 500
Feet

Figure 2 Page 2 of 20
Project Elements and
Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs

Version: 7/25/2024

Legend

Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Access

- Existing
- Improvement
- Walk-In

Temporary Work Areas

- Landing Zone/ Staging Area

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

N

0 250 500

Feet

Figure 2 Page 3 of 20
Project Elements and Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs

Version: 7/25/2024

Legend

Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Access

- Existing
- Improvement

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

N

0 250 500

Feet

Figure 2 Page 4 of 20
Project Elements and Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs

Version: 7/25/2024

Legend

Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Access

- Existing

Temporary Work Areas

- Landing Zone/ Staging Area

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

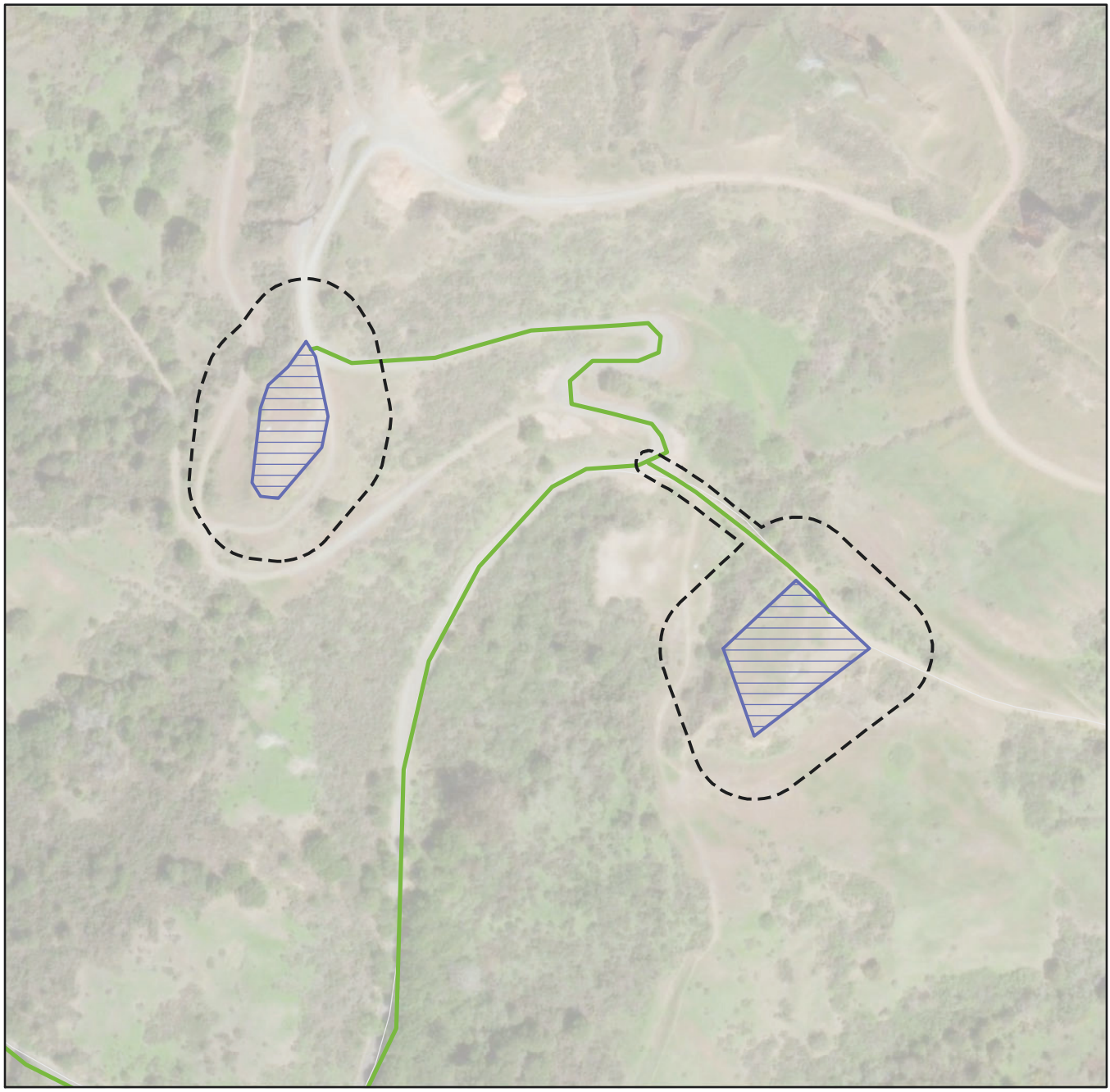
N

0 250 500

Feet

Figure 2 Page 5 of 20
Project Elements and Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs



Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Access

- Existing

Temporary Work Areas

- Landing Zone/ Staging Area

Version: 7/25/2024

Preliminary and Subject to Change
Based on CPUC Requirements,
Final Engineering, and Other Factors

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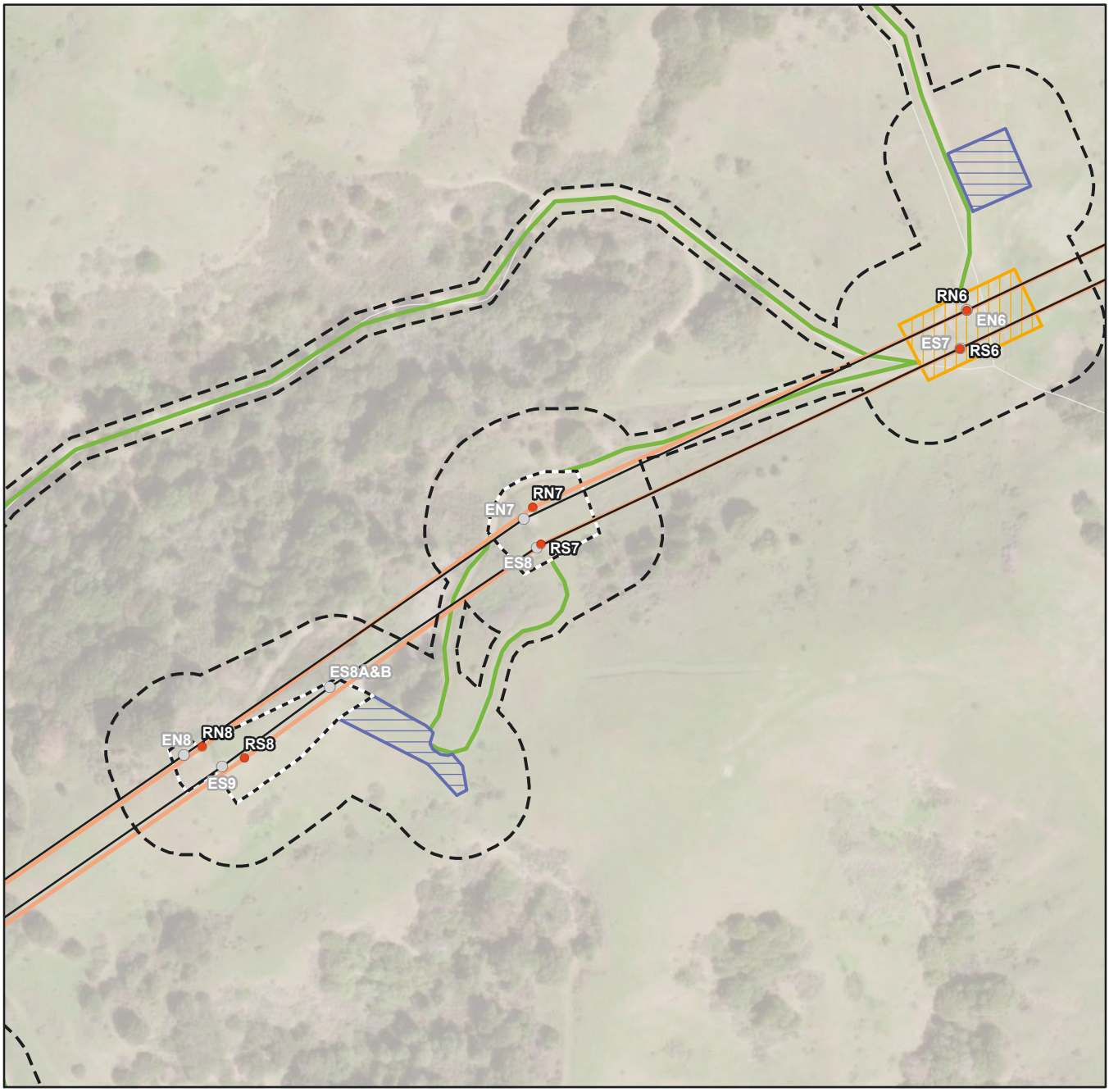
Feet

Figure 2 Page 6 of 20
Project Elements and
Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs



Version: 7/25/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Access

- Existing

Temporary Work Areas

- Landing Zone/ Staging Area
- Tension Pull Site
- Work Area

Preliminary and Subject to Change
Based on CPUC Requirements,
Final Engineering, and Other Factors

N

0 250 500
Feet

Figure 2 Page 7 of 20
Project Elements and
Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs

Version: 7/25/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Access

- Existing
- Improvement
- Walk-In

Temporary Work Areas

- Landing Zone/ Staging Area
- Staging Area
- Work Area

Preliminary and Subject to Change
Based on CPUC Requirements,
Final Engineering, and Other Factors

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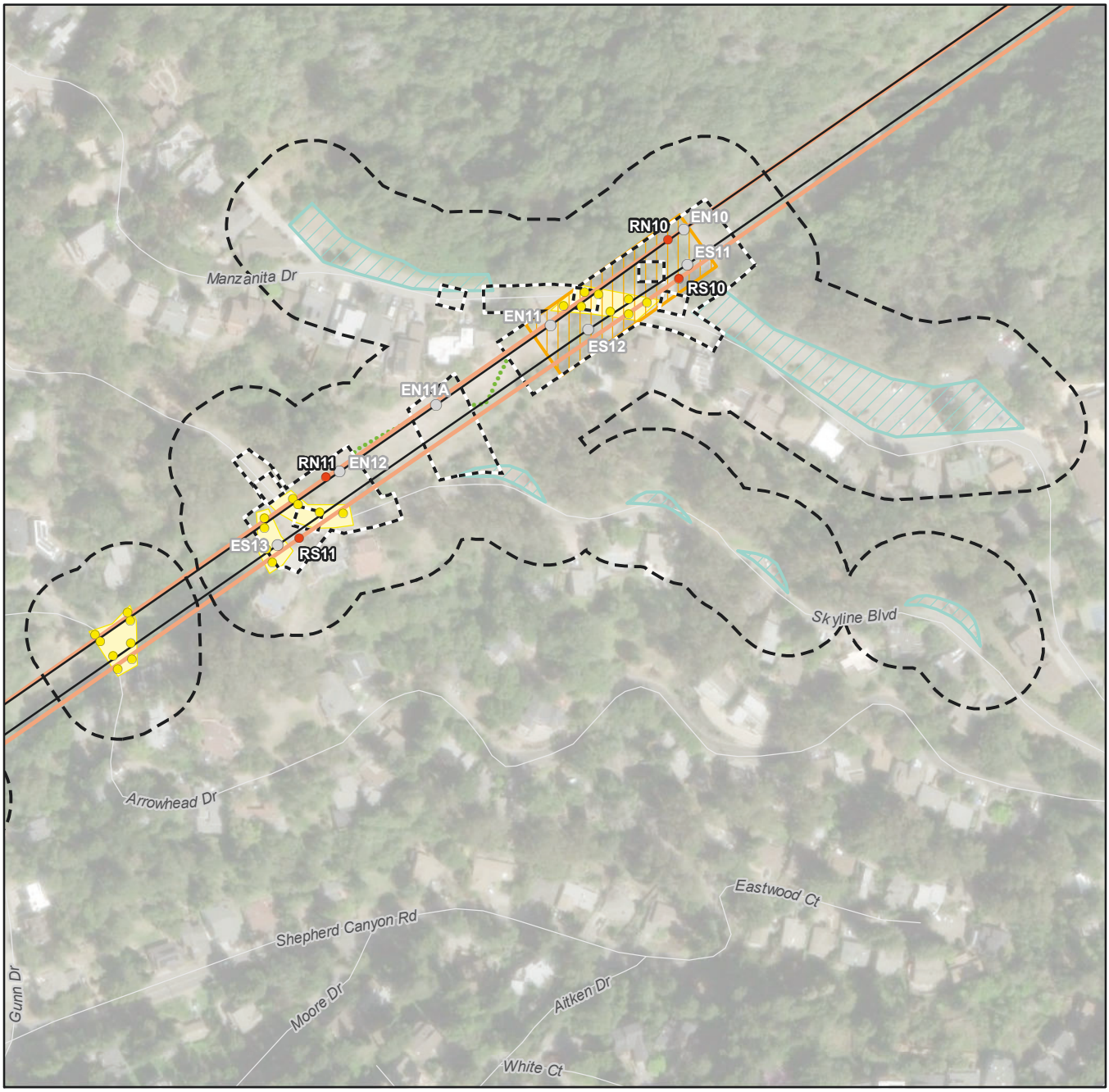
Feet

Figure 2 Page 8 of 20
Project Elements and
Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs



Version: 7/25/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Access

- Walk-In

Temporary Work Areas

- Guard Poles
- Staging Area
- Tension Pull Site
- Work Area

Preliminary and Subject to Change
Based on CPUC Requirements,
Final Engineering, and Other Factors

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Feet

Figure 2 Page 9 of 20
Project Elements and
Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs

Version: 7/25/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Access

- Improvement

Temporary Work Areas

- Fence Removal/Replacement
- Guard Poles
- Staging Area
- Work Area

Preliminary and Subject to Change
Based on CPUC Requirements,
Final Engineering, and Other Factors

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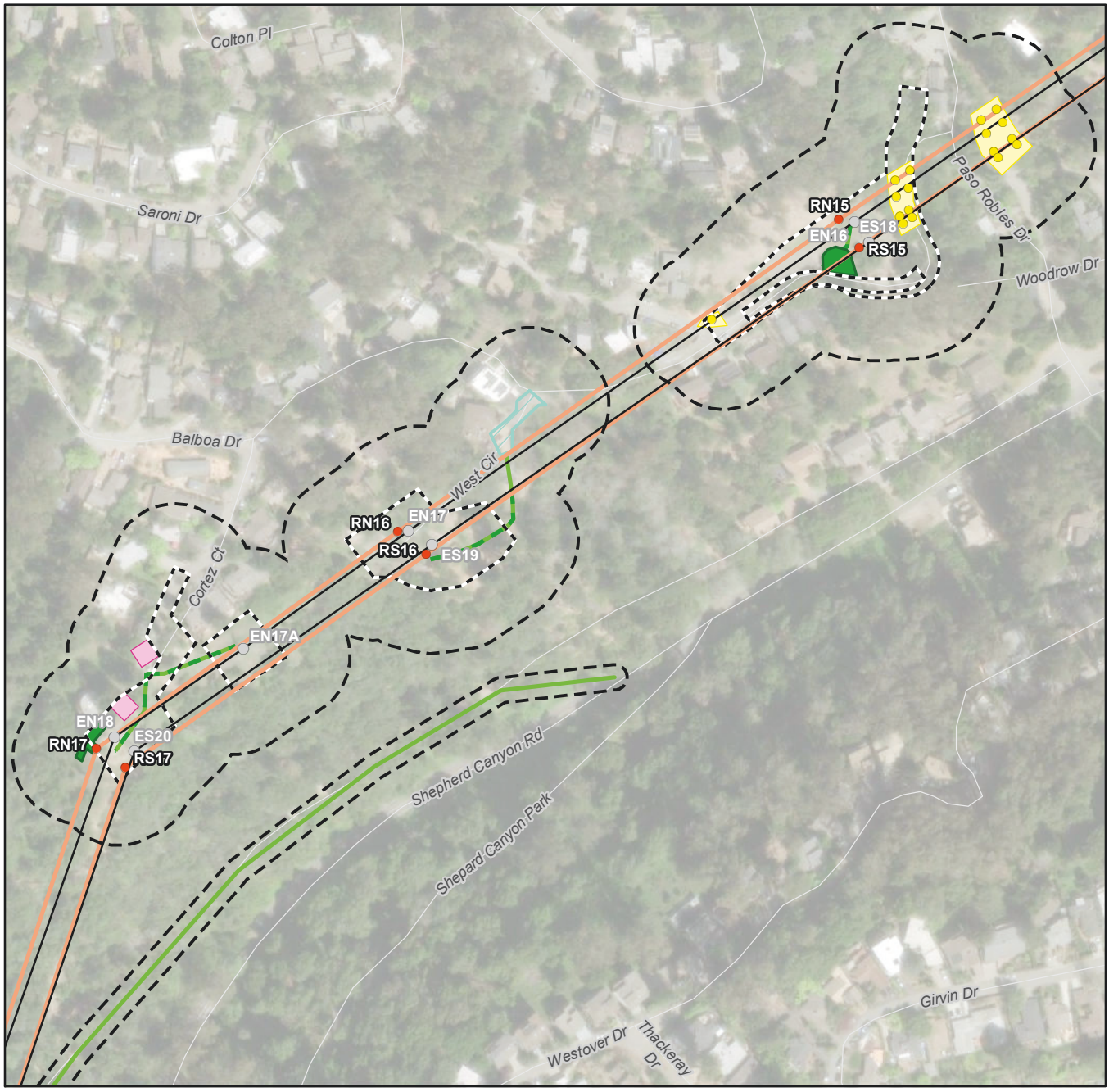
Feet

Figure 2 Page 10 of 20
Project Elements and
Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs



Version: 7/25/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Access

- Existing
- Improvement

Temporary Work Areas

- Crane Pad
- Guard Poles
- Staging Area
- Work Area
- Veg Work/Tree Removal

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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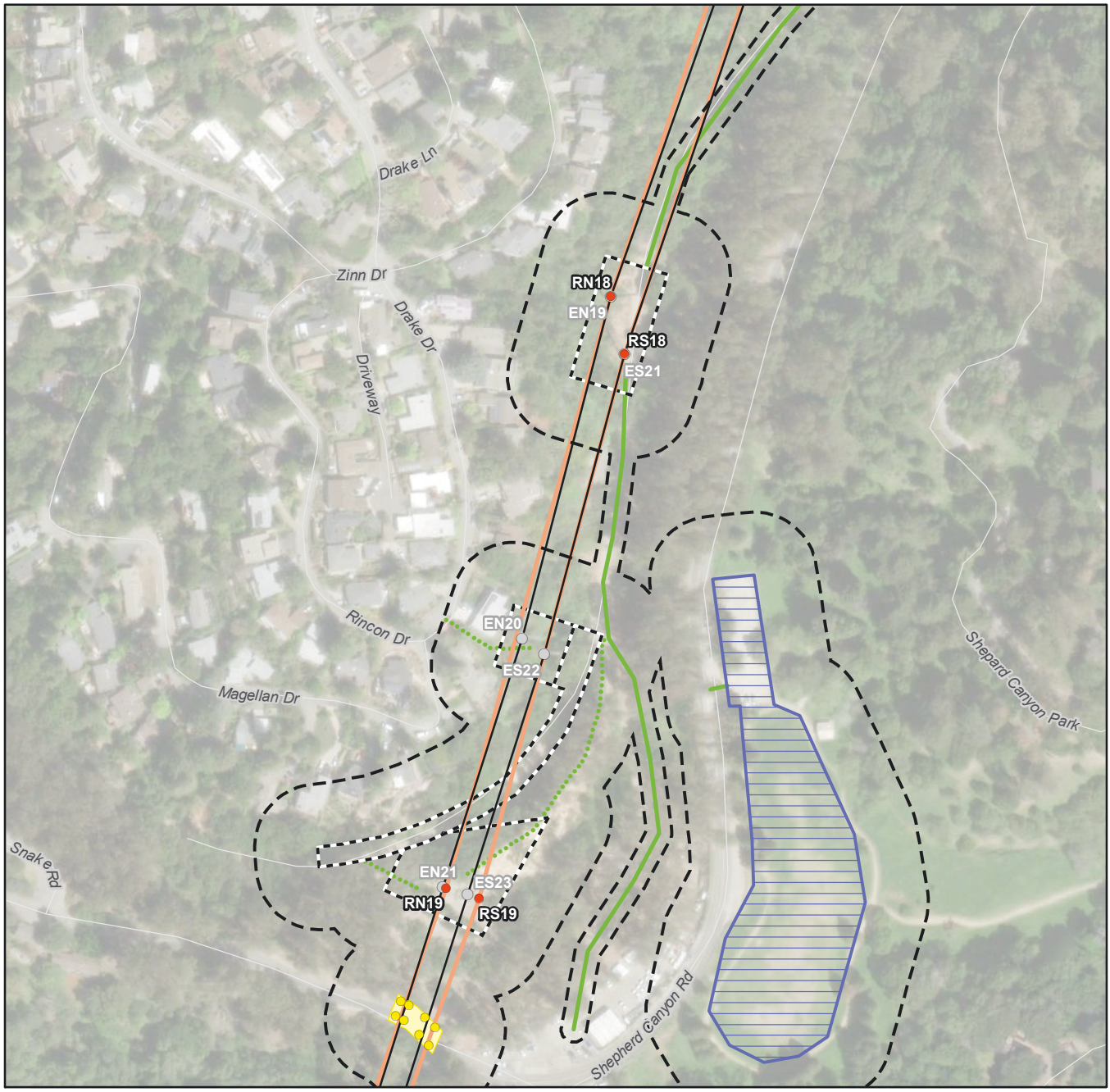
Feet

Figure 2 Page 11 of 20
Project Elements and Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs



Version: 7/25/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Access

- Existing
- Walk-In

Temporary Work Areas

- Guard Poles
- Landing Zone/ Staging Area
- Work Area

Preliminary and Subject to Change
Based on CPUC Requirements,
Final Engineering, and Other Factors

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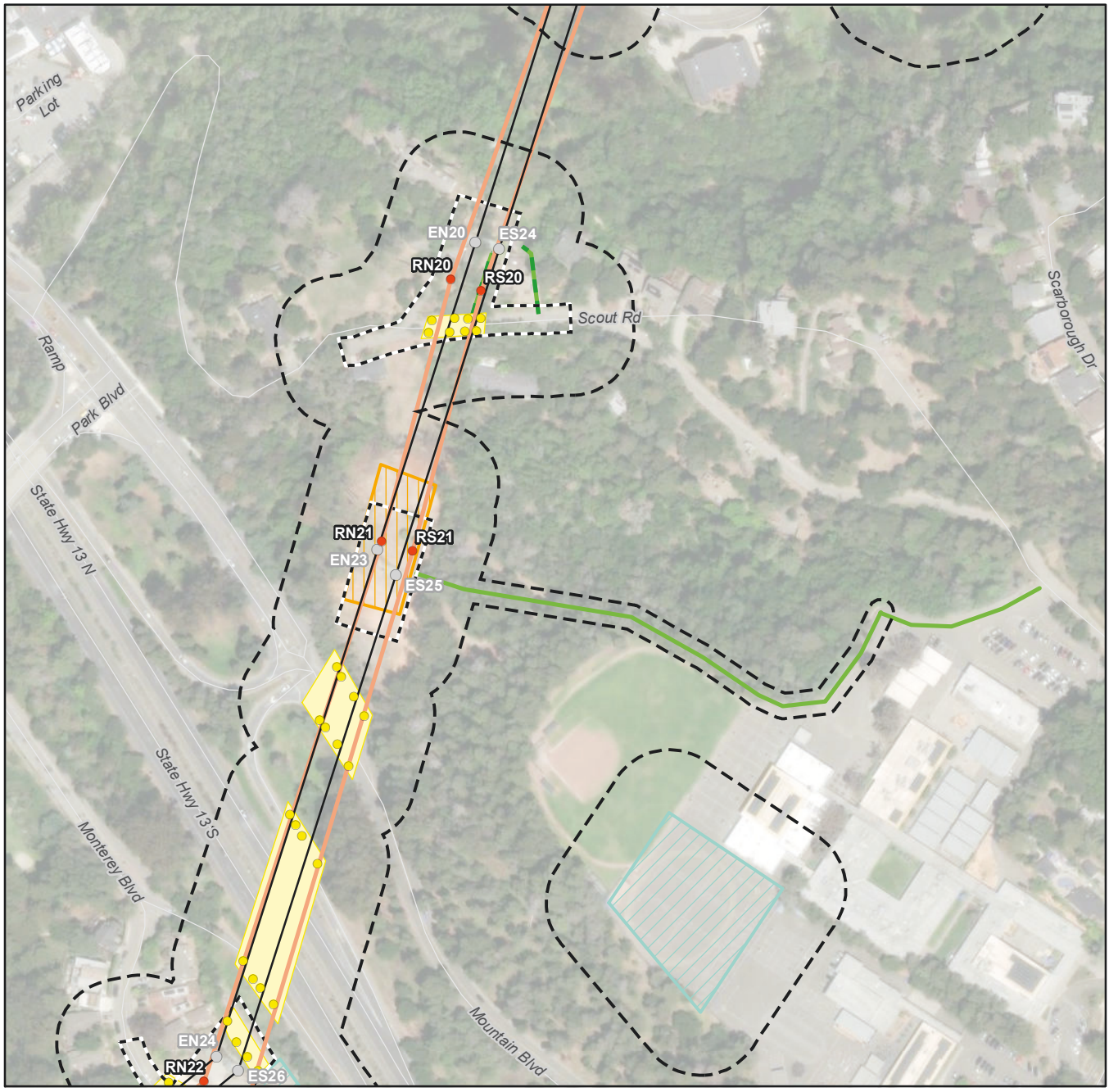
Figure 2 Page 12 of 20
Project Elements and
Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs



Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Access

- Existing
- Improvement

Temporary Work Areas

- Guard Poles
- Staging Area
- Tension Pull Site
- Work Area

Version: 7/25/2024

Preliminary and Subject to Change
Based on CPUC Requirements,
Final Engineering, and Other Factors

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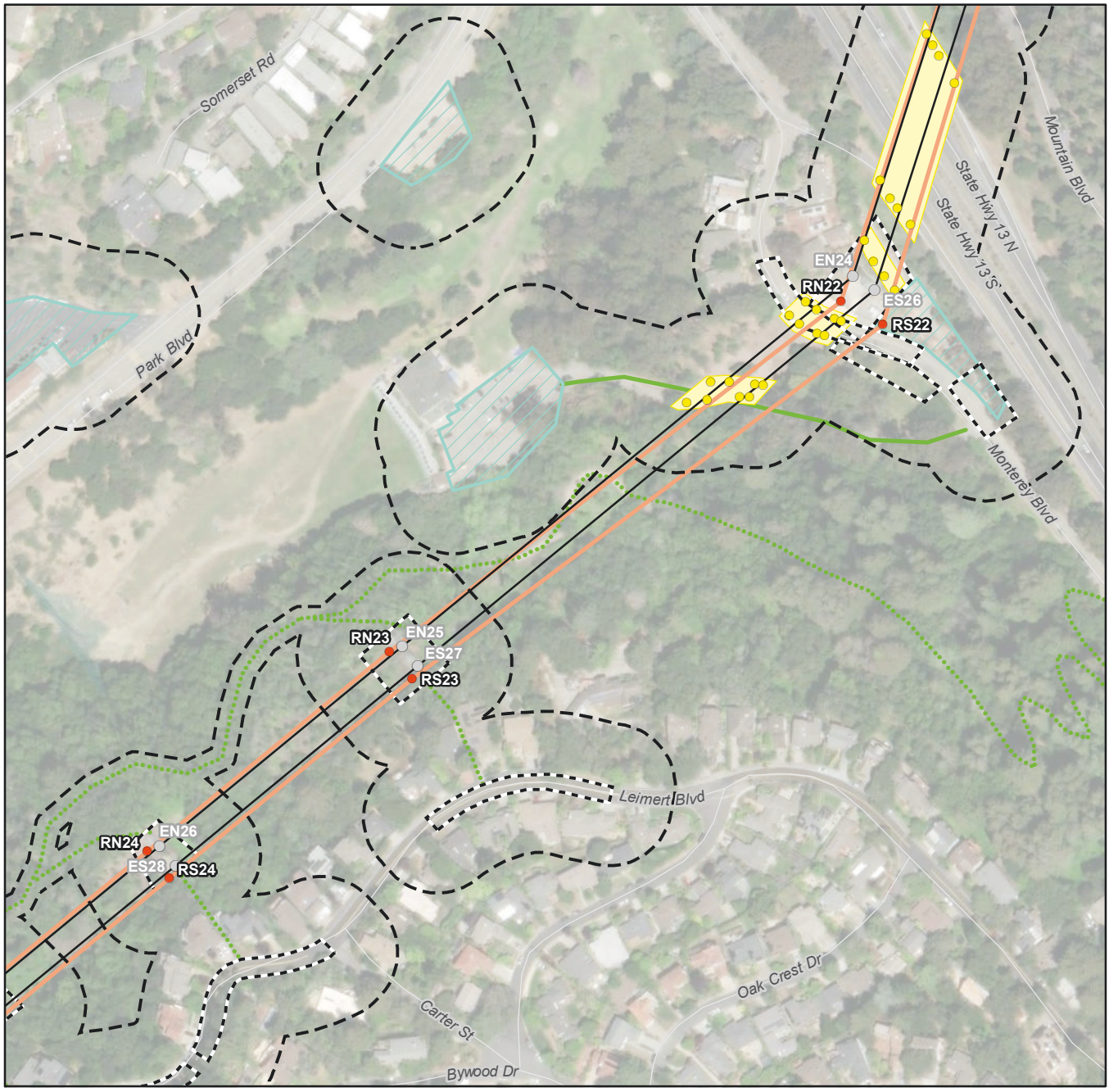
Figure 2 Page 13 of 20
Project Elements and
Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs



Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Access

- Existing
- Walk-In

Temporary Work Areas

- Guard Poles
- Staging Area
- Work Area

Version: 7/25/2024

Preliminary and Subject to Change
Based on CPUC Requirements,
Final Engineering, and Other Factors

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Feet

Figure 2 Page 14 of 20
Project Elements and
Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs

Version: 7/25/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Access

- Walk-In

Temporary Work Areas

- Staging Area
- Work Area
- 4 Lane Work Area Option
- EB Work Area Option
- Move Distribution Pole Option

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

N

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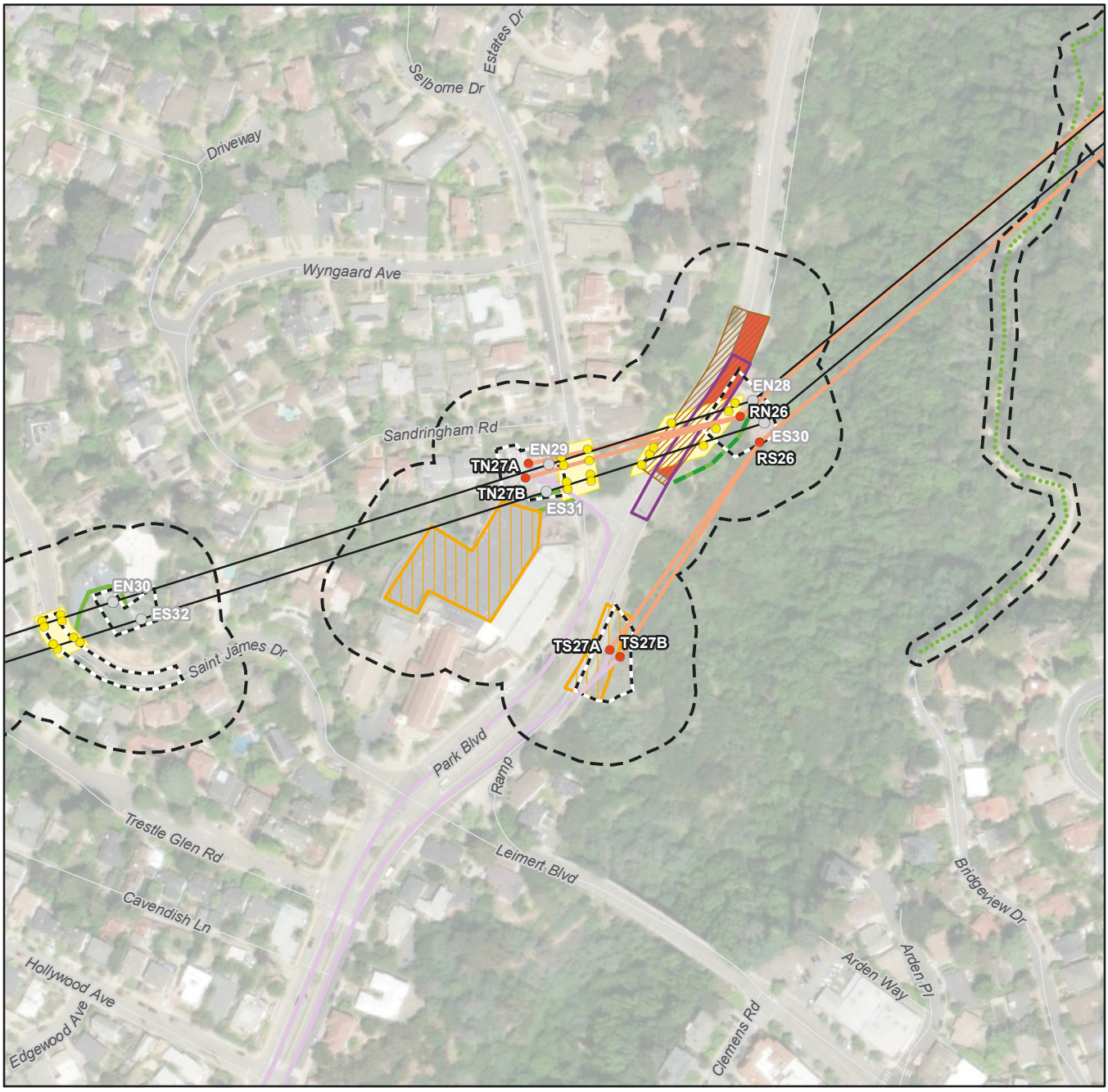
Feet

Figure 2 Page 15 of 20
Project Elements and Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs



Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Underground Routes

- Proposed

Access

- Existing
- Improvement
- Walk-In

Temporary Work Areas

- Guard Poles
- Tension Pull Site
- Work Area
- 4 Lane Work Area Option
- EB Work Area Option
- Move Distribution Pole Option

Version: 7/25/2024

Preliminary and Subject to Change
Based on CPUC Requirements,
Final Engineering, and Other Factors

N

0 250 500
Feet

Figure 2 Page 16 of 20
Project Elements and
Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs

Version: 7/25/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Underground Routes

- Proposed

Access

- Walk-In

Temporary Work Areas

- Guard Poles
- Staging Area
- Work Area

Preliminary and Subject to Change
Based on CPUC Requirements,
Final Engineering, and Other Factors

N

0 250 500
Feet

Figure 2 Page 17 of 20
Project Elements and
Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs

Version: 7/25/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Underground Routes

- Proposed

Access

- Walk-In

Temporary Work Areas

- Guard Poles
- Staging Area
- Work Area

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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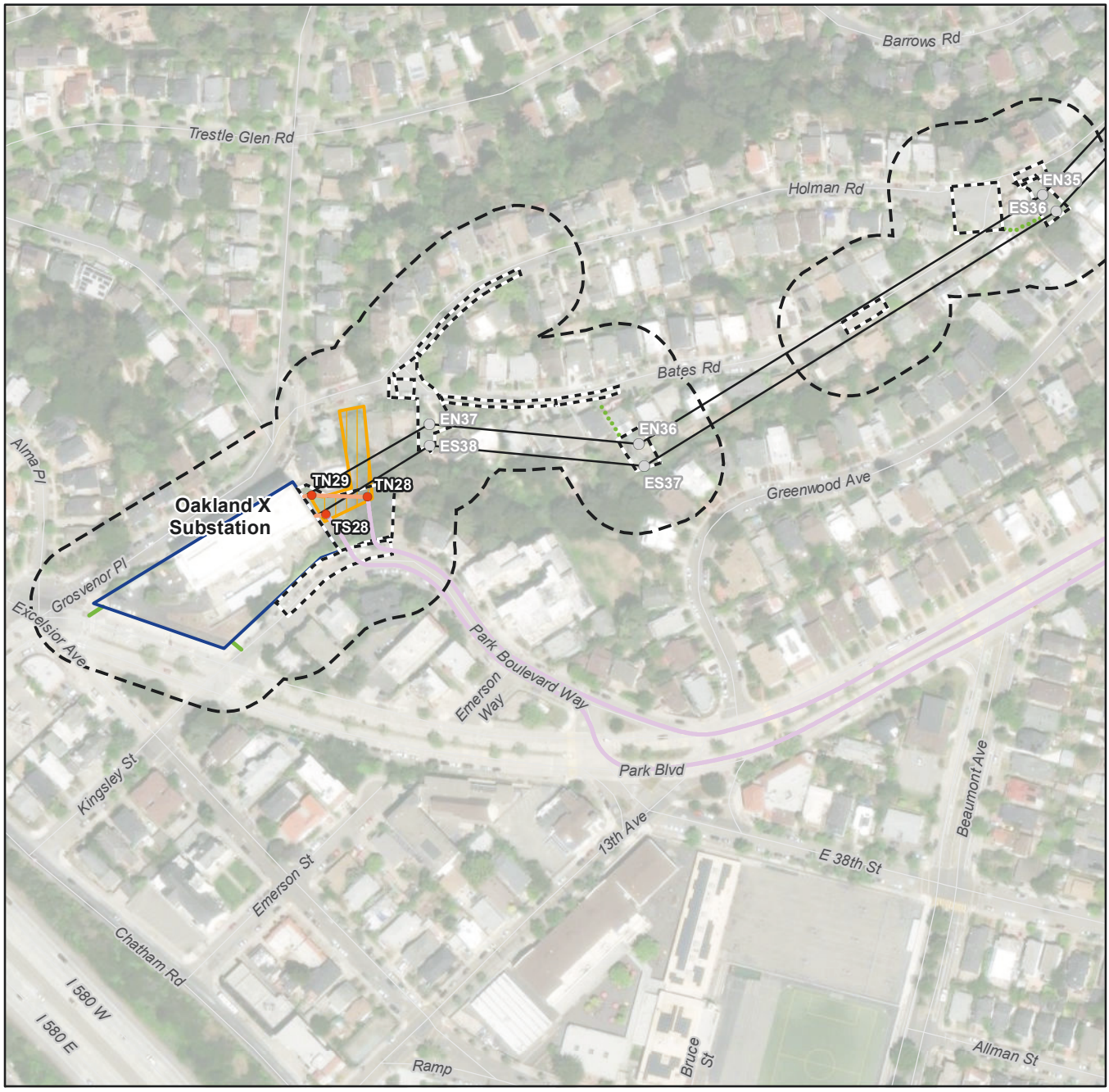
Feet

Figure 2 Page 18 of 20
Project Elements and Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs



Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Underground Routes

- Proposed

Access

- Existing
- Walk-In

Temporary Work Areas

- Substation Work Area
- Tension Pull Site
- Work Area

Version: 7/25/2024

Preliminary and Subject to Change
Based on CPUC Requirements,
Final Engineering, and Other Factors

N

0 250 500
Feet

Figure 2 Page 19 of 20
Project Elements and
Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs

Legend

- Aquatic Resources Study Area (226.3 acres)

Overhead Structures

- Existing
- Proposed

Overhead Routes

- Existing
- Proposed
- Guard Pole

Temporary Work Areas

- Staging Area

Version: 7/25/2024

Preliminary and Subject to Change
Based on CPUC Requirements,
Final Engineering, and Other Factors

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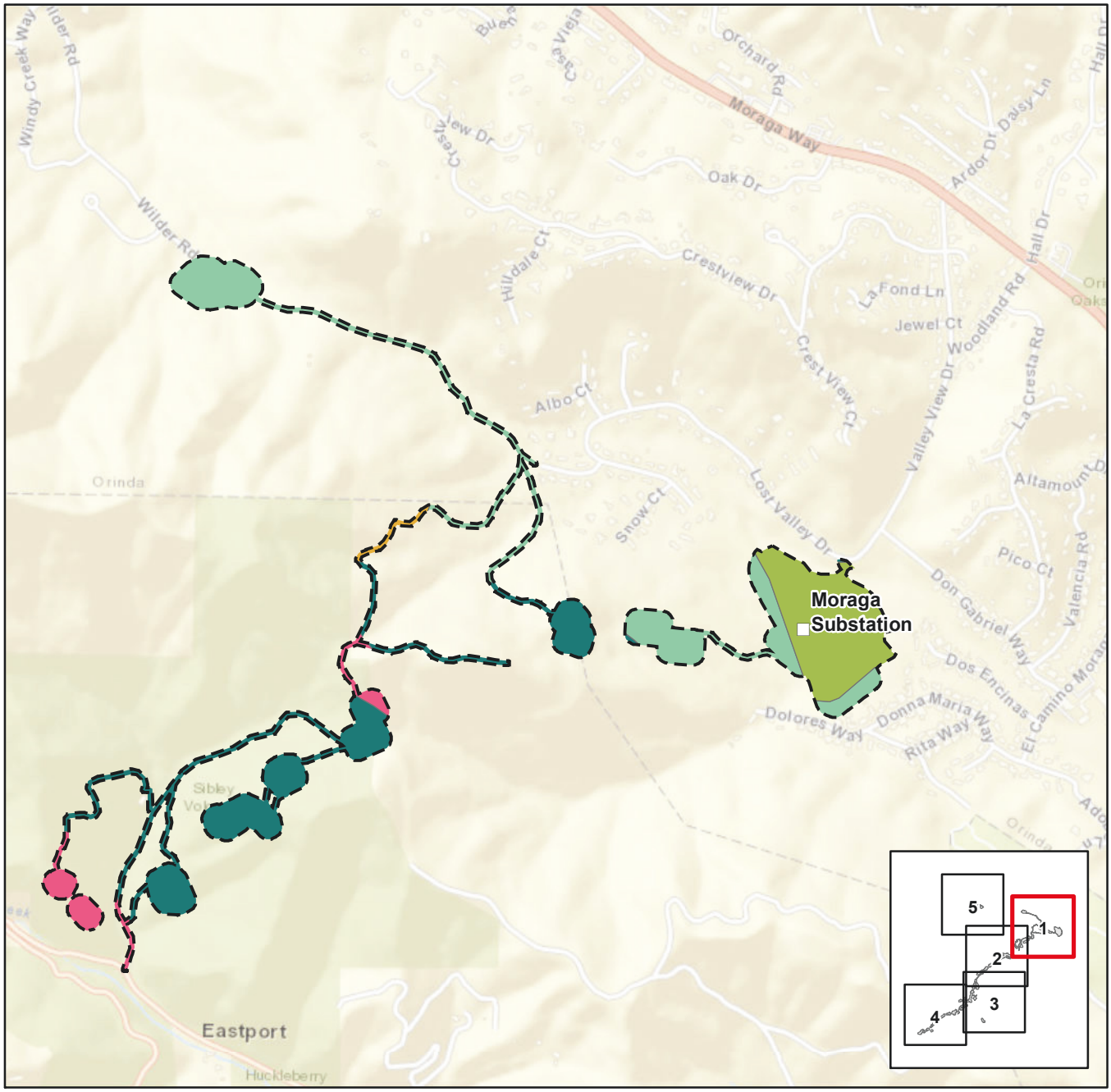
Feet

Figure 2 Page 20 of 20
Project Elements and
Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Jacobs



Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

Soils

- 126: Maymen loam, 30 to 75 percent slopes
- 127: Maymen-Los Gatos complex, 30 to 75 percent slopes, low precipitation, MLRA 15
- 149: Urban land-Danville complex
- 152: Urban land-Tierra complex, 15 to 30 percent slopes
- 158: Xerorthents-Los Osos complex, 30 to 50 percent slopes
- 159: Xerorthents-Millsholm complex, 30 to 50 percent slopes
- CkB: Cropley clay, 2 to 5 percent slopes
- DdE: Diablo clay, 15 to 30 percent slopes, MLRA 15
- LcF: Lodo clay loam, 30 to 50 percent slopes, very rocky, MLRA 15
- LhF: Los Osos clay loam, 30 to 50 percent slopes
- MeG: Millsholm loam, 20 to 60 percent slopes, moist, MLRA 15
- MeGcc: Millsholm loam, 20 to 60 percent slopes, moist, MLRA 15
- Qa: Quarry

N

0 0.25 Miles

Figure 3. Page 1 of 5
NRCS Soil Series within the Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Jacobs

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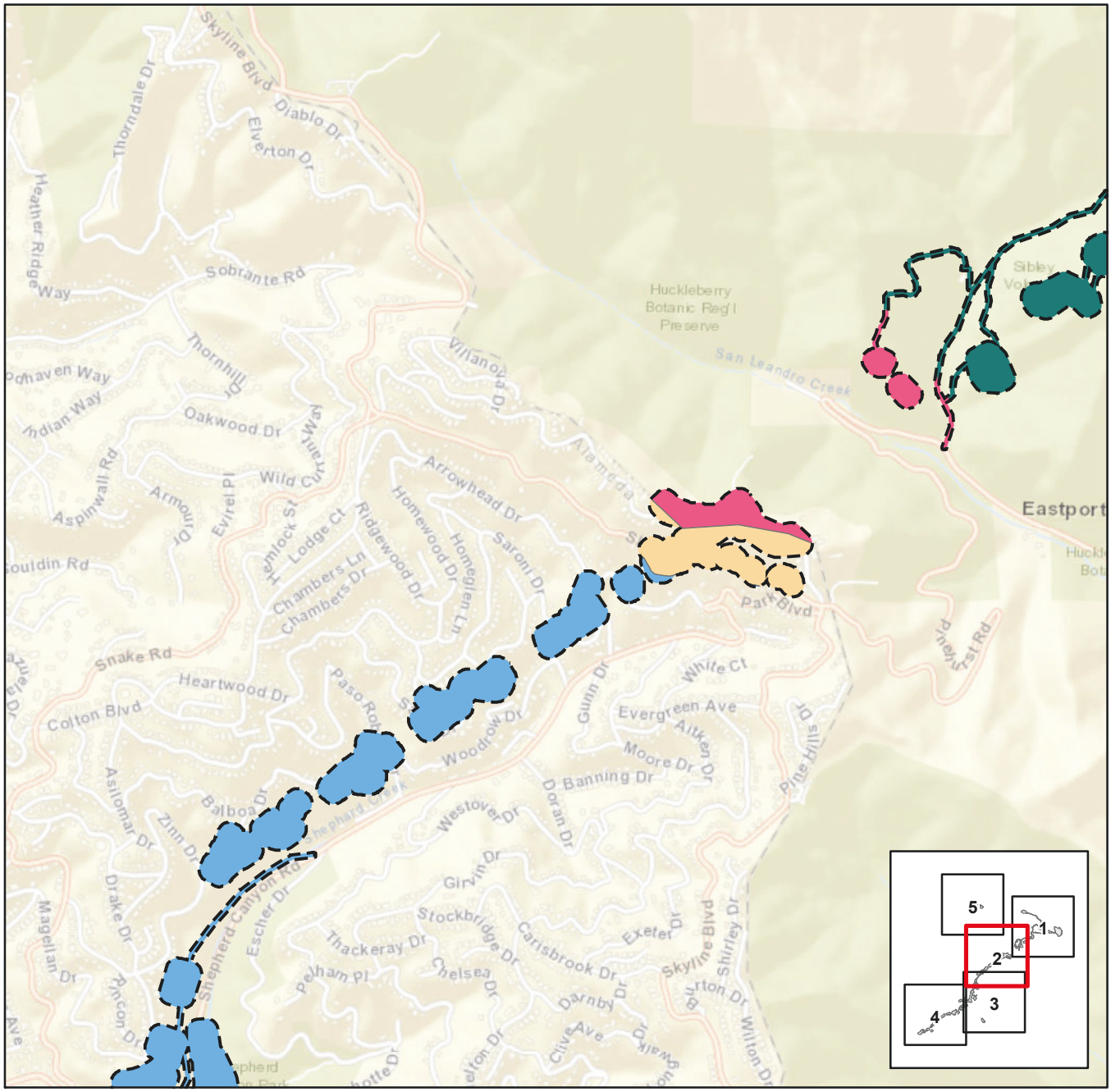

Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

Soils

- 126: Maymen loam, 30 to 75 percent slopes
- 127: Maymen-Los Gatos complex, 30 to 75 percent slopes, low precipitation, MLRA 15
- 149: Urban land-Danville complex
- 152: Urban land-Tierra complex, 15 to 30 percent slopes
- 158: Xerorthents-Los Osos complex, 30 to 50 percent slopes
- 159: Xerorthents-Millsholm complex, 30 to 50 percent slopes
- CkB: Cropley clay, 2 to 5 percent slopes
- DdE: Diablo clay, 15 to 30 percent slopes, MLRA 15
- LcF: Lodo clay loam, 30 to 50 percent slopes, very rocky, MLRA 15
- LhF: Los Osos clay loam, 30 to 50 percent slopes
- MeG: Millsholm loam, 20 to 60 percent slopes, moist, MLRA 15
- MeGcc: Millsholm loam, 20 to 60 percent slopes, moist, MLRA 15
- Qa: Quarry

N

0 0.25 Miles

Figure 3. Page 2 of 5
NRCS Soil Series within the Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Jacobs

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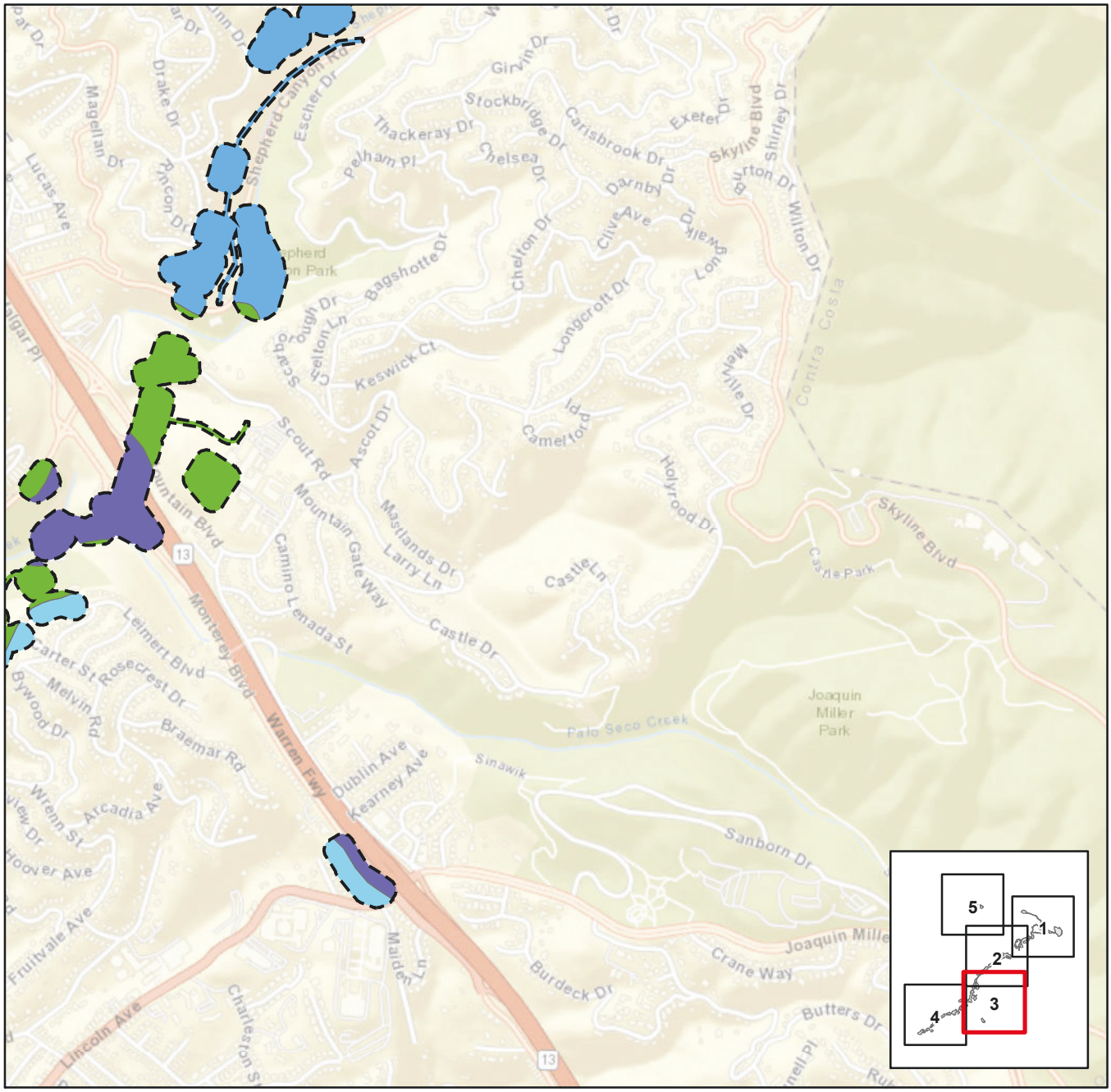

Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

Soils

- 126: Maymen loam, 30 to 75 percent slopes
- 127: Maymen-Los Gatos complex, 30 to 75 percent slopes, low precipitation, MLRA 15
- 149: Urban land-Danville complex
- 152: Urban land-Tierra complex, 15 to 30 percent slopes
- 158: Xerorthents-Los Osos complex, 30 to 50 percent slopes
- 159: Xerorthents-Millsholm complex, 30 to 50 percent slopes
- CkB: Cropley clay, 2 to 5 percent slopes
- DdE: Diablo clay, 15 to 30 percent slopes, MLRA 15
- LcF: Lodo clay loam, 30 to 50 percent slopes, very rocky, MLRA 15
- LhF: Los Osos clay loam, 30 to 50 percent slopes
- MeG: Millsholm loam, 20 to 60 percent slopes, moist, MLRA 15
- MeGcc: Millsholm loam, 20 to 60 percent slopes, moist, MLRA 15
- Qa: Quarry

Figure 3. Page 3 of 5
NRCS Soil Series within the Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Jacobs

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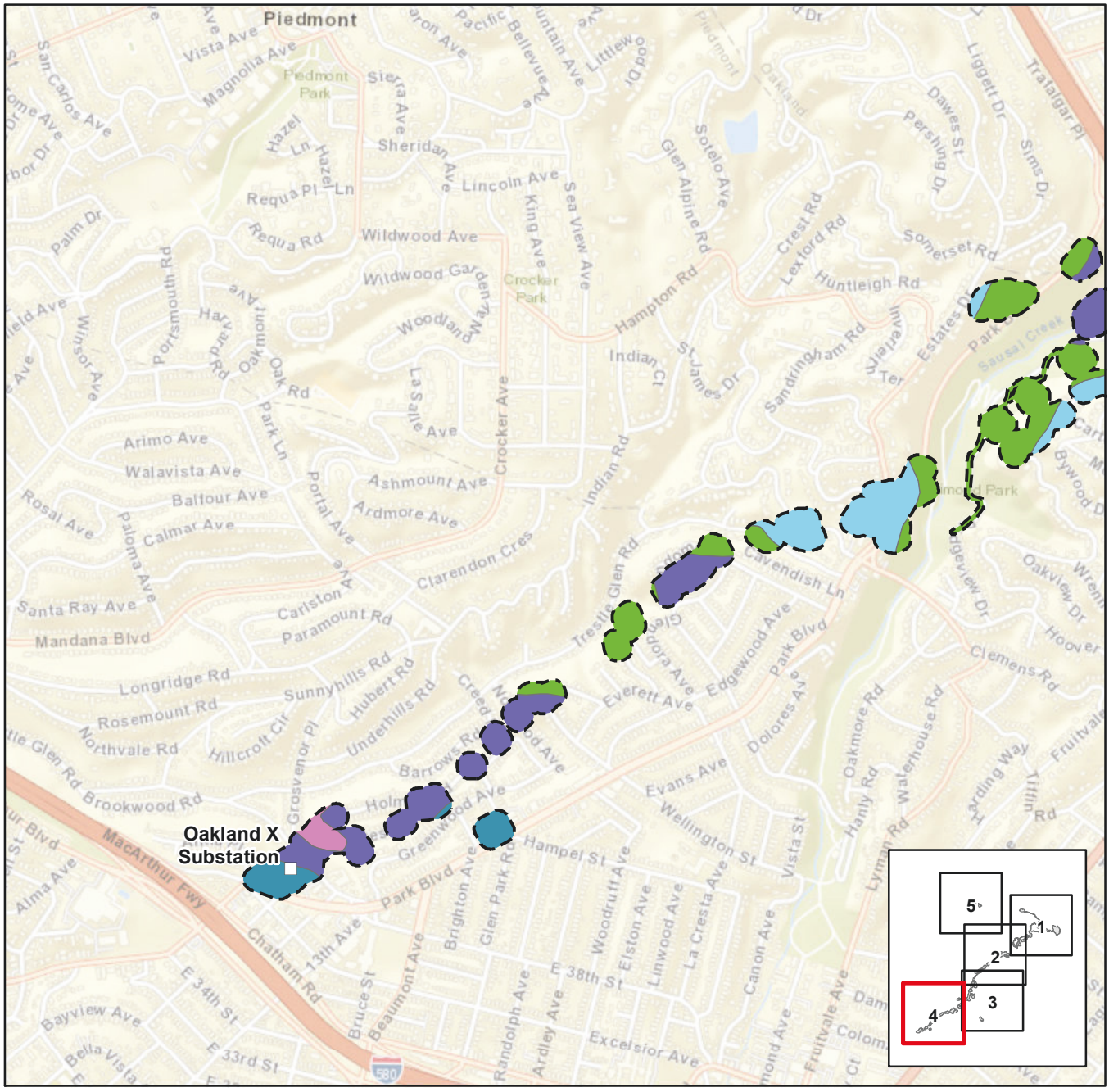


Version: 2/1/2024

Legend

Aquatic Resources Study Area (226.3 acres)

Soils

- 126: Maymen loam, 30 to 75 percent slopes
- 127: Maymen-Los Gatos complex, 30 to 75 percent slopes, low precipitation, MLRA 15
- 149: Urban land-Danville complex
- 152: Urban land-Tierra complex, 15 to 30 percent slopes
- 158: Xerorthents-Los Osos complex, 30 to 50 percent slopes
- 159: Xerorthents-Millsholm complex, 30 to 50 percent slopes
- CkB: Cropley clay, 2 to 5 percent slopes
- DdE: Diablo clay, 15 to 30 percent slopes, MLRA 15
- LcF: Lodo clay loam, 30 to 50 percent slopes, very rocky, MLRA 15
- LhF: Los Osos clay loam, 30 to 50 percent slopes
- MeG: Millsholm loam, 20 to 60 percent slopes, moist, MLRA 15
- MeGcc: Millsholm loam, 20 to 60 percent slopes, moist, MLRA 15
- Qa: Quarry

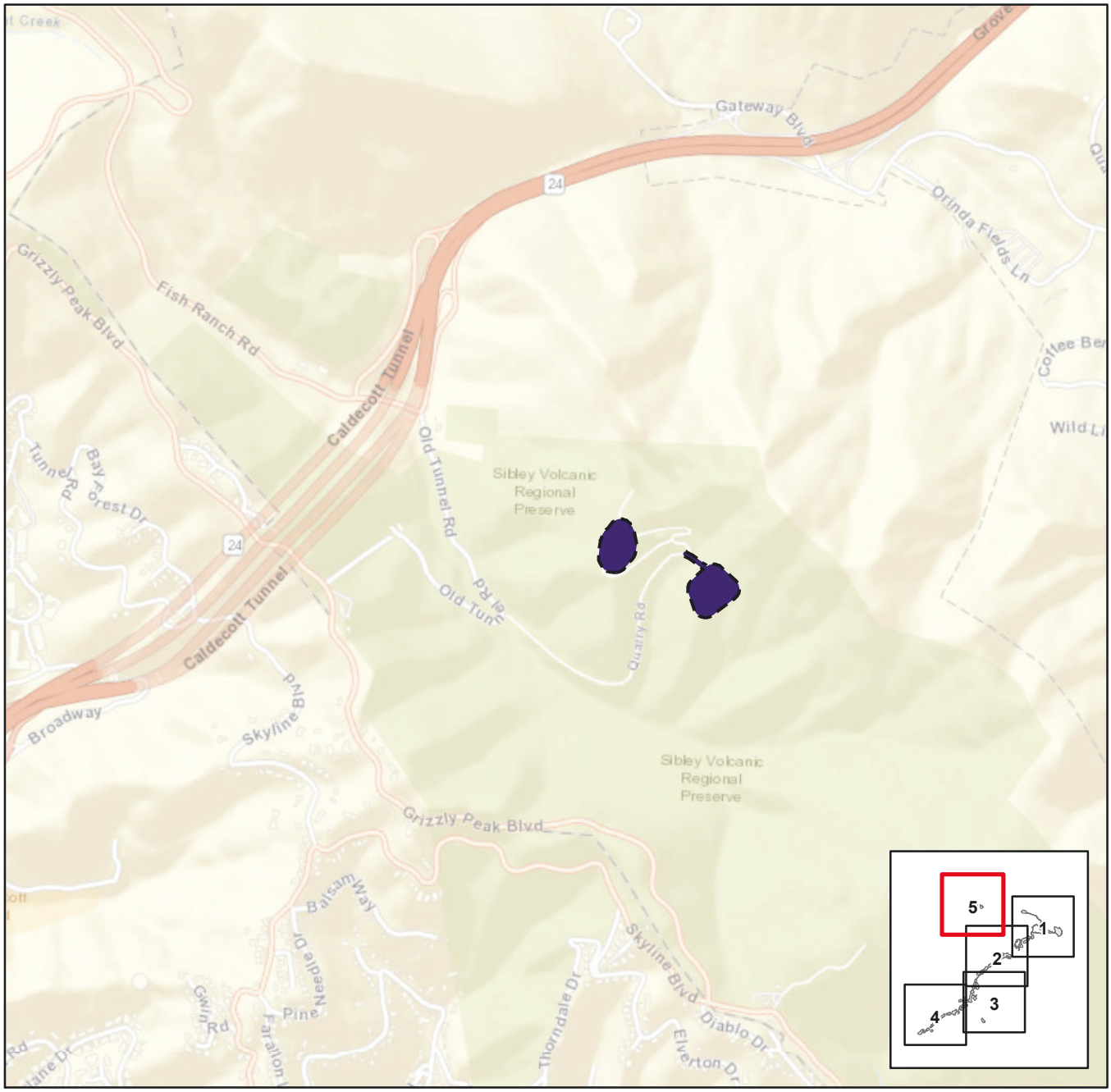
N

0 0.25 Miles

Figure 3. Page 4 of 5
NRCS Soil Series within the Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Jacobs



Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

Soils

- 126: Maymen loam, 30 to 75 percent slopes
- 127: Maymen-Los Gatos complex, 30 to 75 percent slopes, low precipitation, MLRA 15
- 149: Urban land-Danville complex
- 152: Urban land-Tierra complex, 15 to 30 percent slopes
- 158: Xerorthents-Los Osos complex, 30 to 50 percent slopes
- 159: Xerorthents-Millsholm complex, 30 to 50 percent slopes
- CkB: Cropley clay, 2 to 5 percent slopes
- DdE: Diablo clay, 15 to 30 percent slopes, MLRA 15
- LcF: Lodo clay loam, 30 to 50 percent slopes, very rocky, MLRA 15
- LhF: Los Osos clay loam, 30 to 50 percent slopes
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- MeGcc: Millsholm loam, 20 to 60 percent slopes, moist, MLRA 15
- Qa: Quarry

N

0 0.25 Miles

Figure 3. Page 5 of 5
NRCS Soil Series within the Aquatic Resources Study Area
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Jacobs

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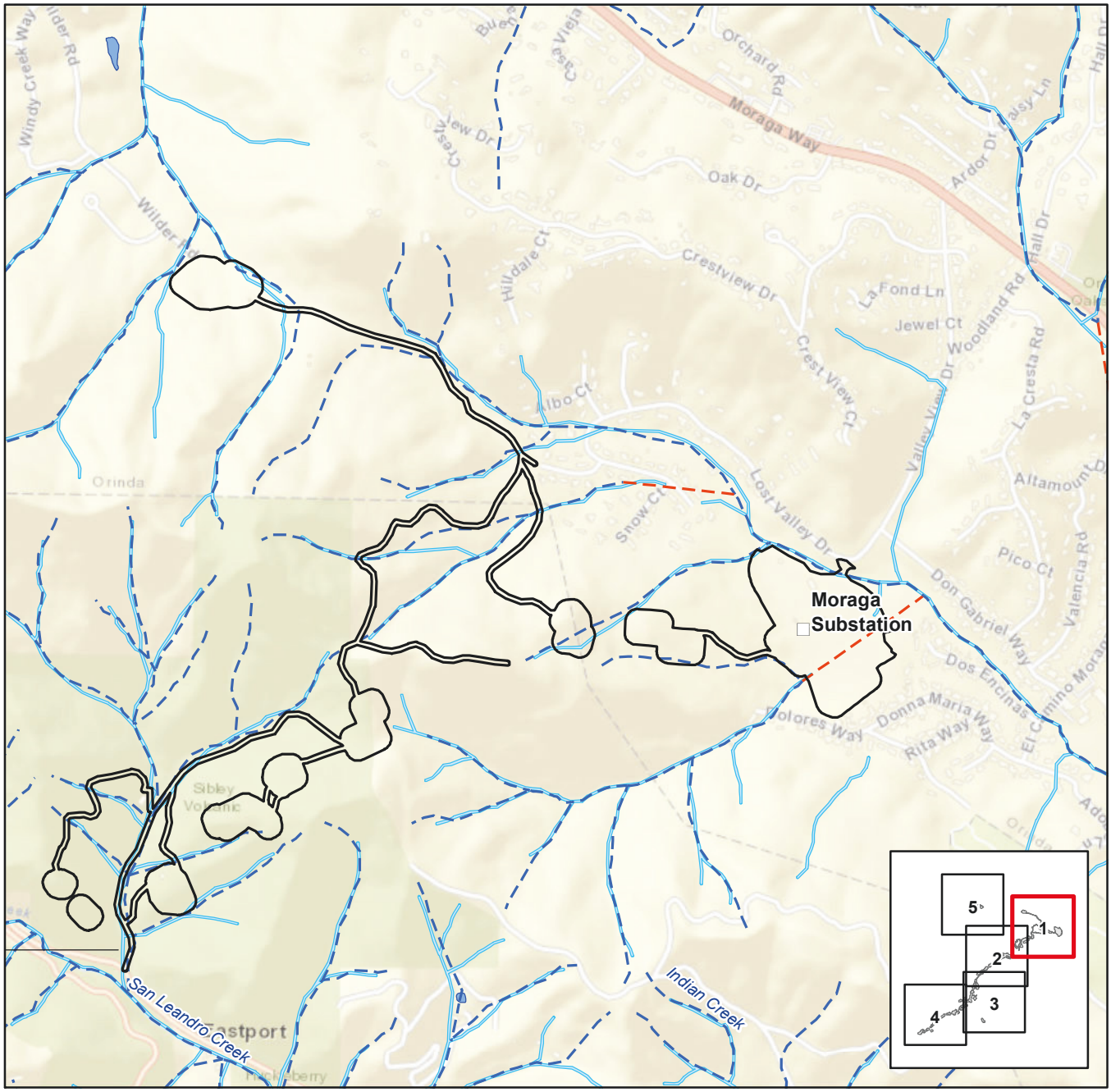

Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

National Hydrography Dataset

- Culvert
- Pipeline
- Stream

National Wetlands Inventory

- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

N

0 0.25

Miles

Figure 4. Page 1 of 5
National Hydrography Dataset and National Wetlands Inventory
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Jacobs

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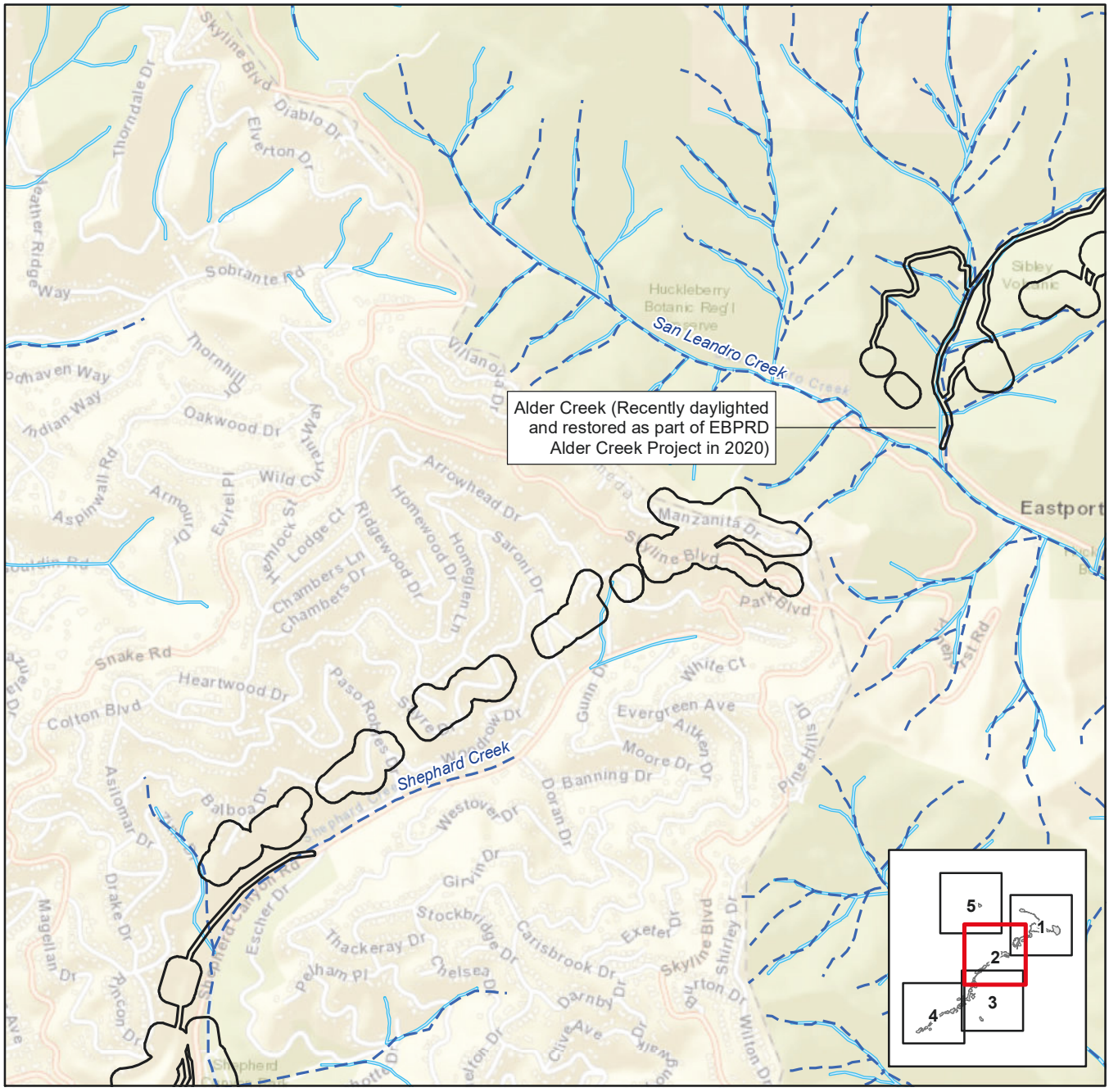

Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

National Hydrography Dataset

- Culvert
- Pipeline
- Stream

National Wetlands Inventory

- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

N

0 0.25

Miles

Figure 4. Page 2 of 5
National Hydrography Dataset and National Wetlands Inventory
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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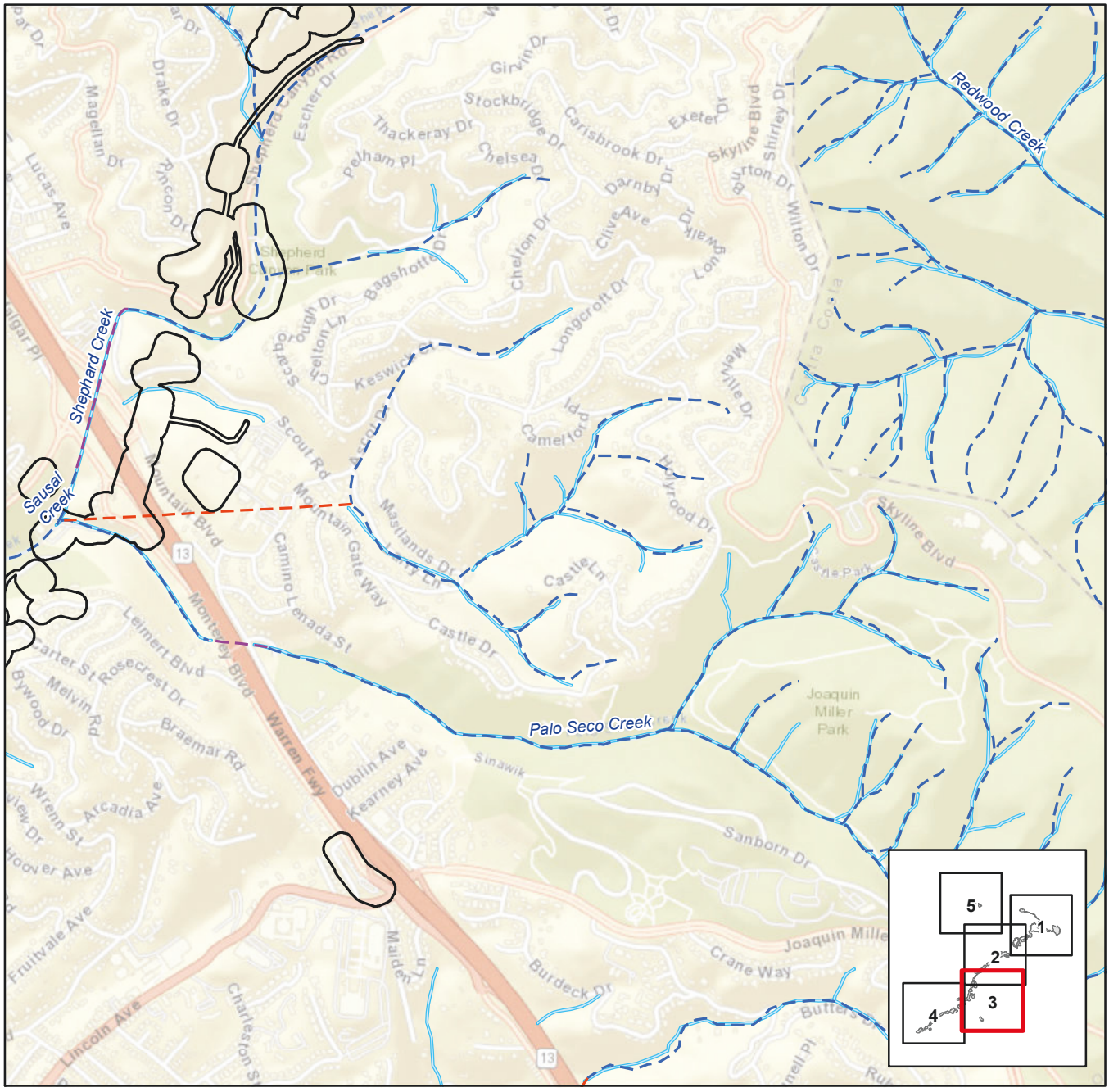

Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

National Hydrography Dataset

- Culvert
- Pipeline
- Stream

National Wetlands Inventory

- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

N

0 0.25

Miles

Figure 4. Page 3 of 5
National Hydrography Dataset and National Wetlands Inventory
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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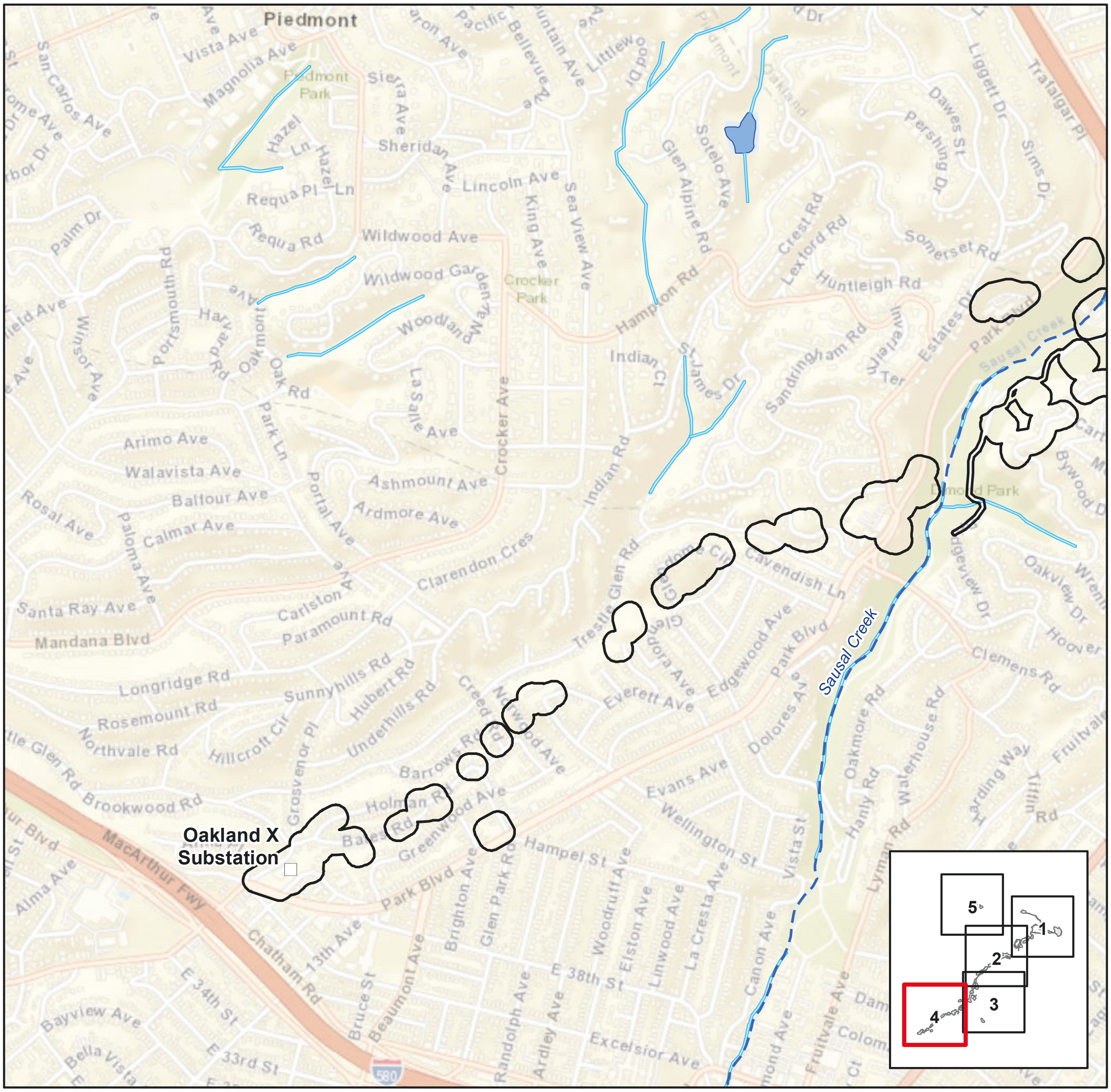

Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

National Hydrography Dataset

- Culvert
- Pipeline
- Stream

National Wetlands Inventory

- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

N

0 0.25
Miles

Figure 4. Page 4 of 5
National Hydrography Dataset and National Wetlands Inventory
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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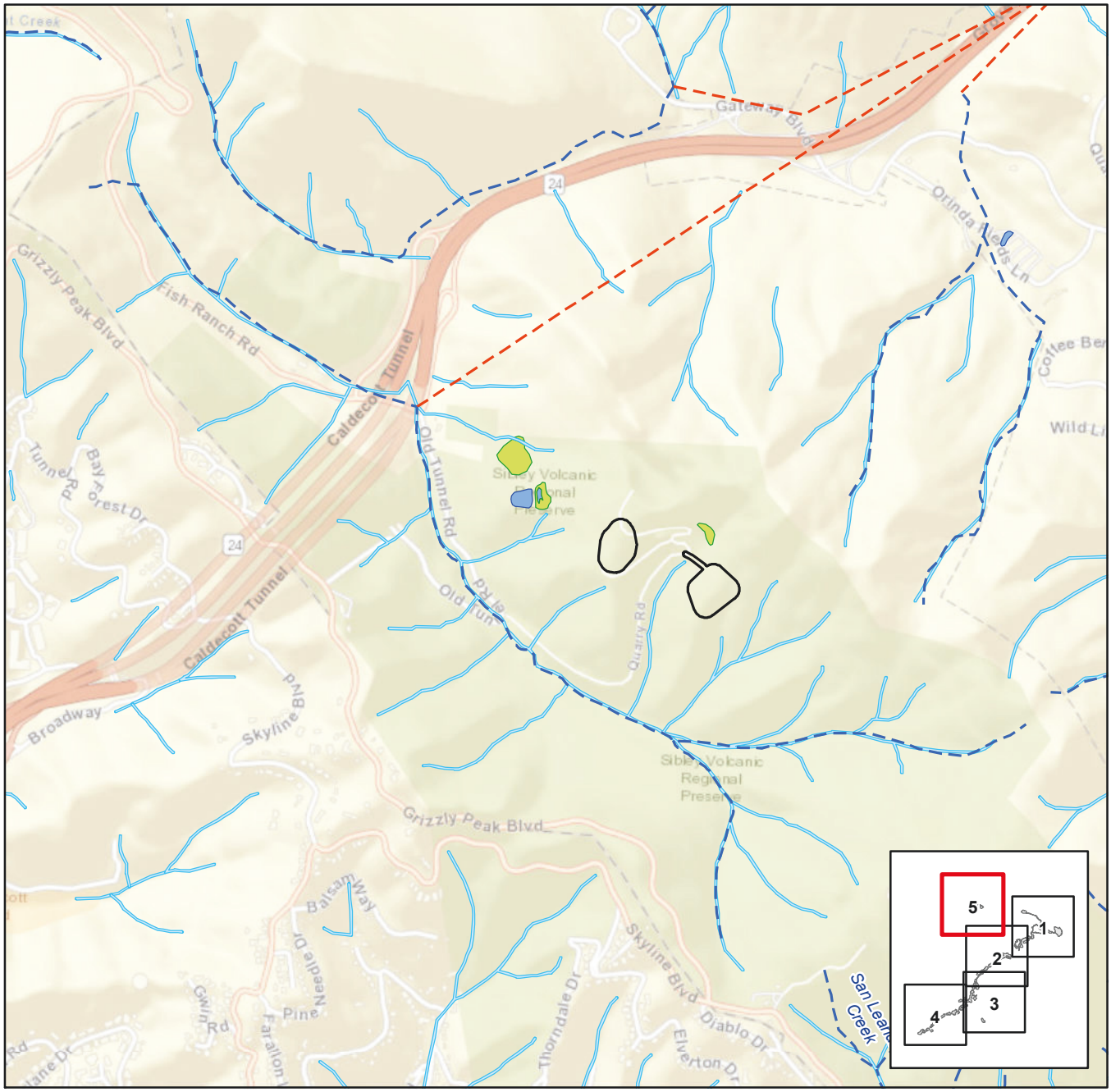

Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 acres)

National Hydrography Dataset

- Culvert
- Pipeline
- Stream

National Wetlands Inventory

- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

N

0 0.25

Miles

Figure 4. Page 5 of 5
National Hydrography Dataset and National Wetlands Inventory
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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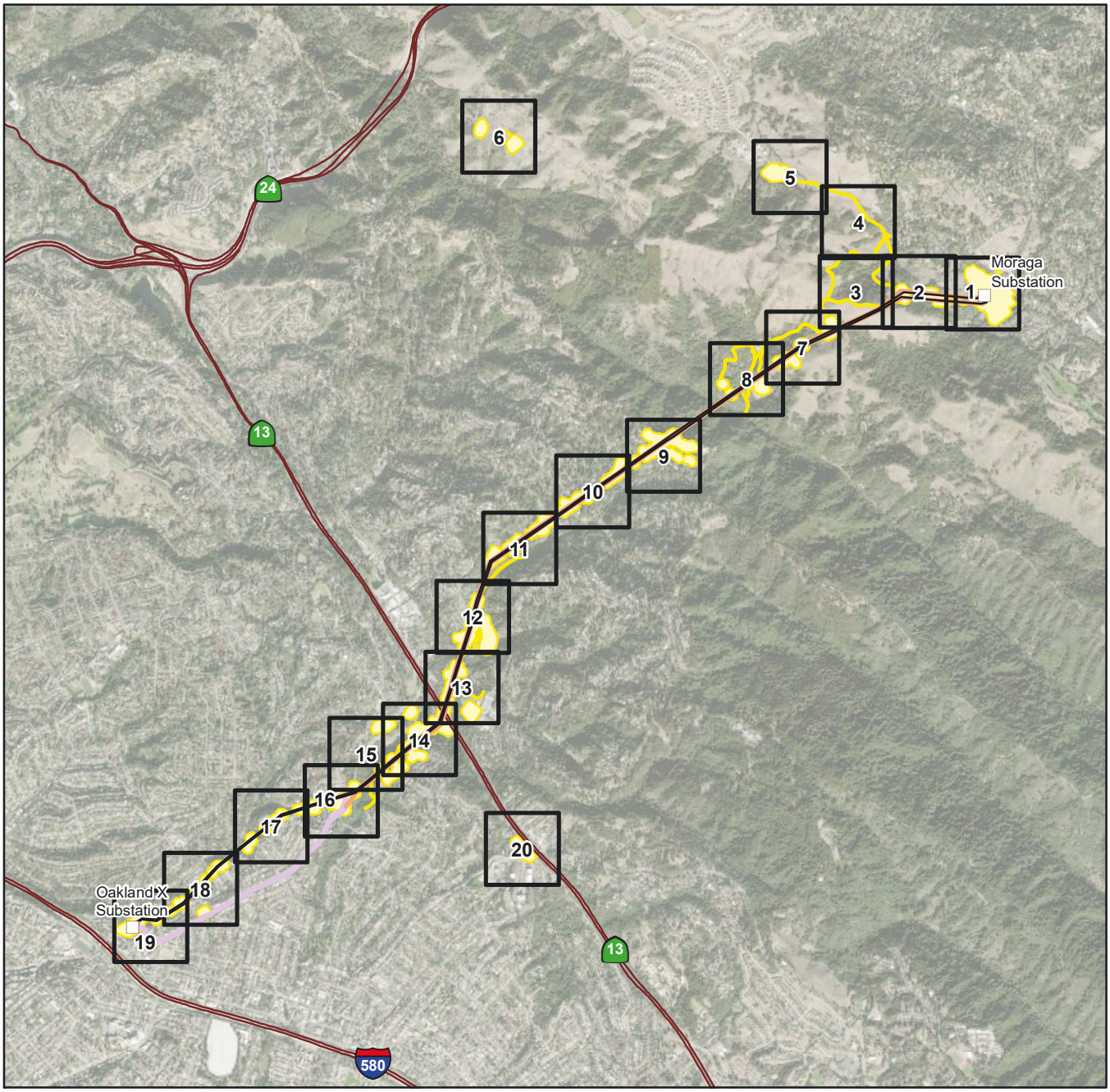

Version: 2/1/2024

Legend

- Detail Map Sheet
- Aquatic Resources Study Area (226.3 acres)
- Substation

Overhead Routes

- Existing
- Proposed

Underground Routes

- Proposed

N

0 0.5 1

Miles

Figure 5 Overview
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Jacobs

Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 ac)
- Photo Location wtih View Direction
- Sample Point
- OHWM Transect
- Constructed Wetland/ Stormwater BMP

Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

N

0 250 500

Feet

Figure 5 Page 1 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
ac = acres
lf = linear feet

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Jacobs

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- Culverted Waters (1,514 lf)
- Flow Direction

Version: 2/1/2024

N

0 250 500

Feet

Figure 5 Page 2 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
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Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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Version: 2/1/2024

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Aquatic Resources

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- Culverted Waters (1,514 lf)
- Flow Direction

N

0 250 500

Feet

Figure 5 Page 3 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
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Version: 2/1/2024

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Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

N

0 250 500

Feet

Figure 5 Page 4 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
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Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

Version: 2/1/2024

N

0 250 500

Feet

Figure 5 Page 5 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
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Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 ac)
- Photo Location wtih View Direction
- Sample Point
- OHWM Transect
- Constructed Wetland/ Stormwater BMP

Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

N

0 250 500

Feet

Figure 5 Page 6 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
ac = acres
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Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 ac)
- Photo Location wtih View Direction
- Sample Point
- OHWM Transect
- Constructed Wetland/ Stormwater BMP

Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

N

0 250 500

Feet

Figure 5 Page 7 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
ac = acres
lf = linear feet

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 ac)
- Photo Location wtih View Direction
- Sample Point
- OHWM Transect
- Constructed Wetland/ Stormwater BMP

Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

N

0 250 500

Feet

Figure 5 Page 8 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
ac = acres
lf = linear feet

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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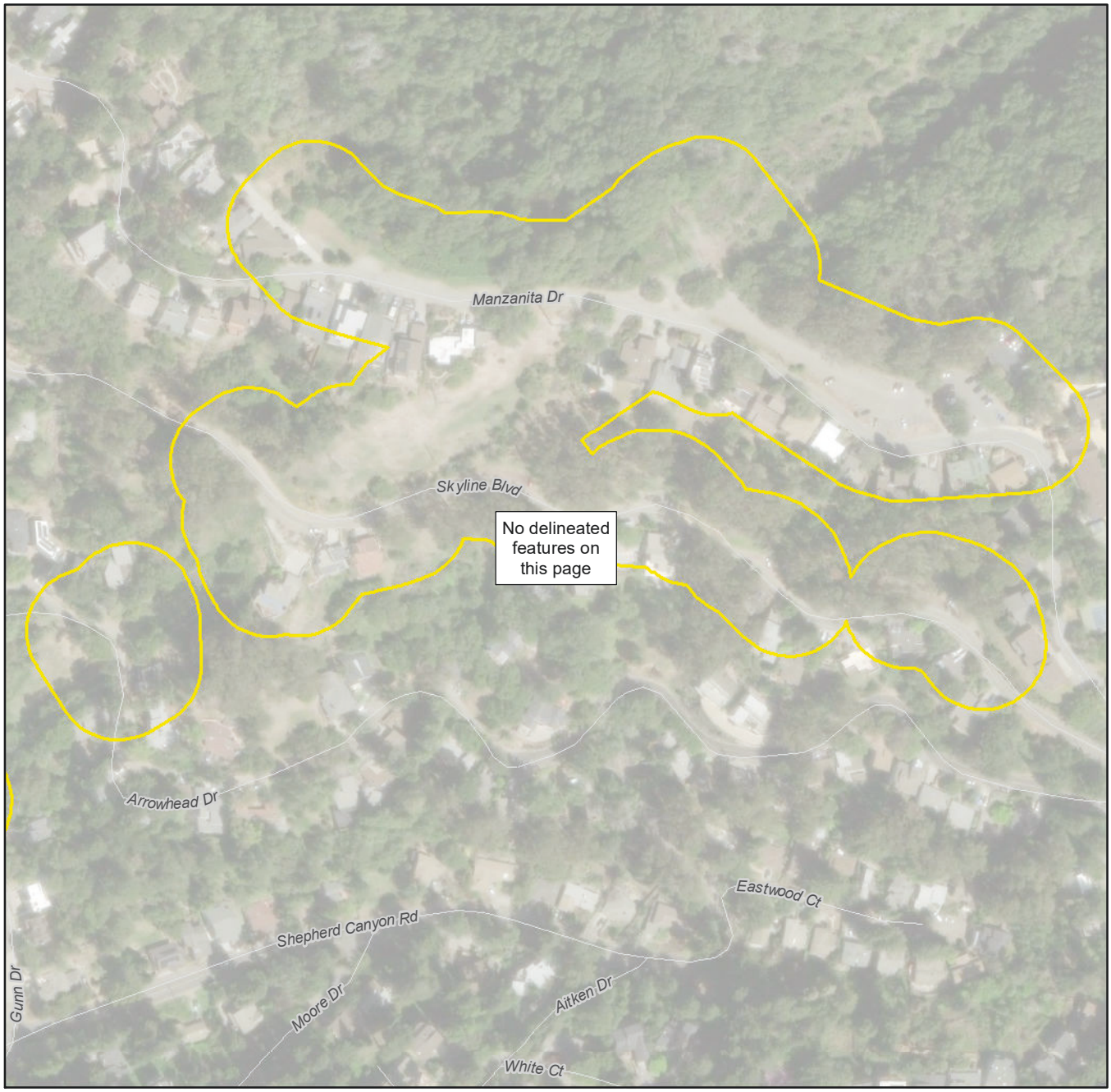

Legend

- Aquatic Resources Study Area (226.3 ac)
- Photo Location wtih View Direction
- Sample Point
- OHWM Transect
- Constructed Wetland/ Stormwater BMP

Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

Version: 2/1/2024

N

0 250 500

Feet

Figure 5 Page 9 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
ac = acres
lf = linear feet

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 ac)
- Photo Location wtih View Direction
- Sample Point
- OHWM Transect
- Constructed Wetland/ Stormwater BMP

Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

N

0 250 500

Feet

Figure 5 Page 10 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
ac = acres
lf = linear feet

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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Legend

- Aquatic Resources Study Area (226.3 ac)
- Photo Location wtih View Direction
- Sample Point
- OHWM Transect
- Constructed Wetland/ Stormwater BMP

Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

Version: 2/1/2024

N

0 250 500

Feet

Figure 5 Page 11 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
ac = acres
lf = linear feet

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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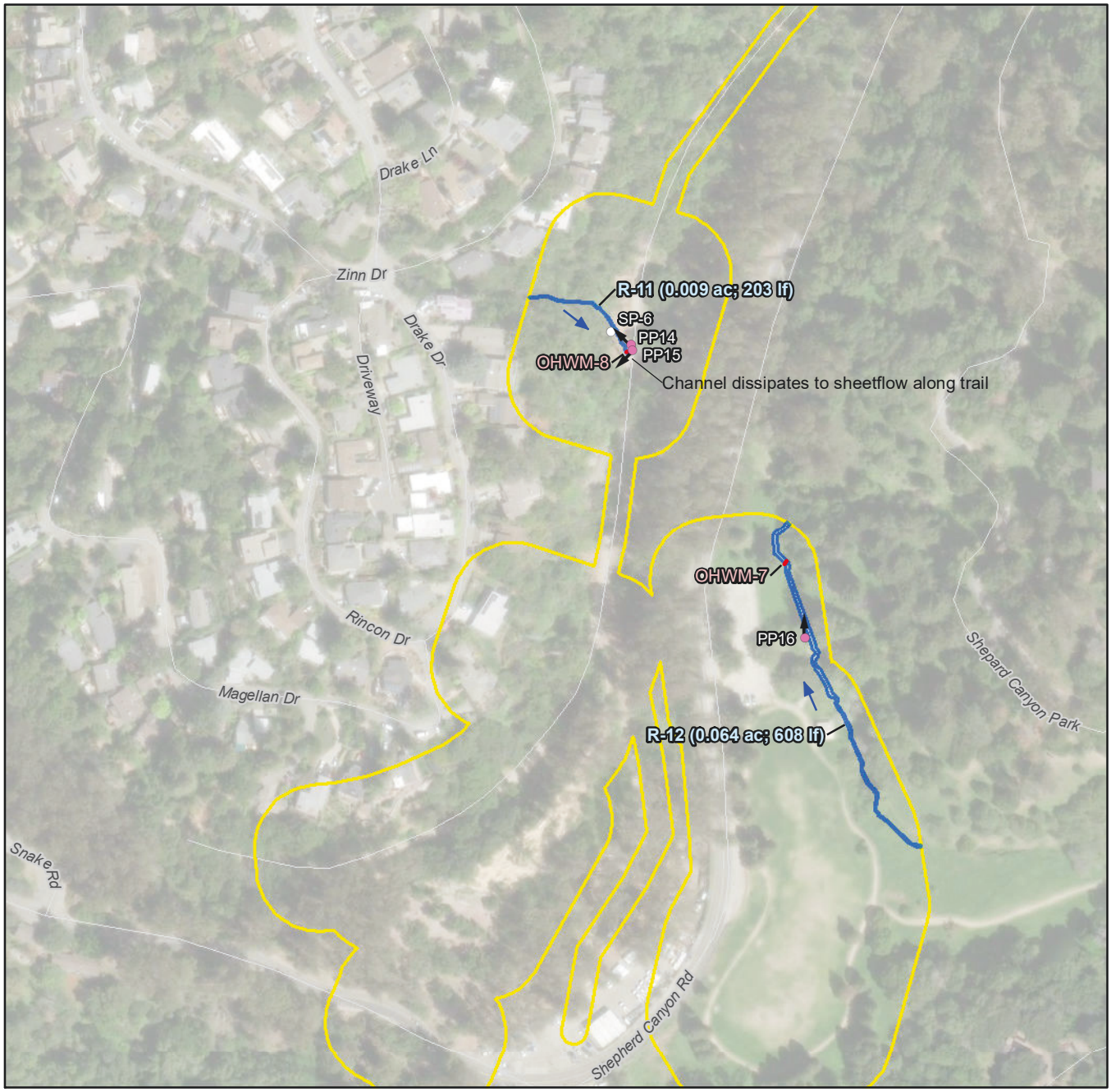

Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 ac)
- Photo Location wtih View Direction
- Sample Point
- OHWM Transect
- Constructed Wetland/ Stormwater BMP

Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

N

0 250 500

Feet

Figure 5 Page 12 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
ac = acres
lf = linear feet

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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- Aquatic Resources Study Area (226.3 ac)
- Photo Location wtih View Direction
- Sample Point
- OHWM Transect
- Constructed Wetland/ Stormwater BMP

Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

Version: 2/1/2024

N

0 250 500

Feet

Figure 5 Page 13 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
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Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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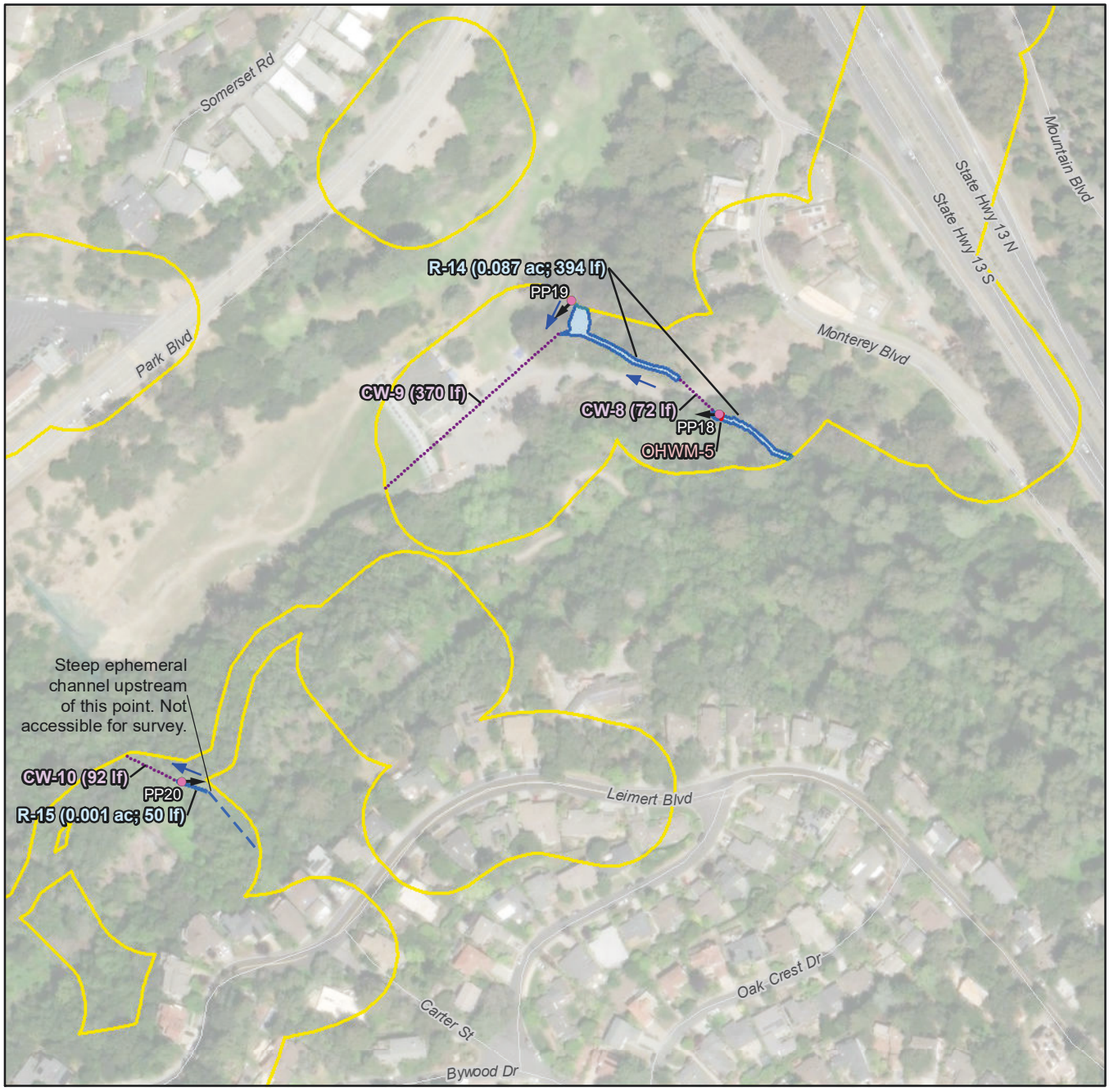

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- Aquatic Resources Study Area (226.3 ac)
- Photo Location wtih View Direction
- Sample Point
- OHWM Transect
- Constructed Wetland/ Stormwater BMP

Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

Version: 2/1/2024

N

0 250 500

Feet

Figure 5 Page 14 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
ac = acres
lf = linear feet

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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Version: 2/1/2024

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- Photo Location wtih View Direction
- Sample Point
- OHWM Transect
- Constructed Wetland/ Stormwater BMP

Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

N

0 250 500

Feet

Figure 5 Page 15 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
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Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 ac)
- Photo Location wtih View Direction
- Sample Point
- OHWM Transect
- Constructed Wetland/ Stormwater BMP

Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

N

0 250 500

Feet

Figure 5 Page 16 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
ac = acres
lf = linear feet

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

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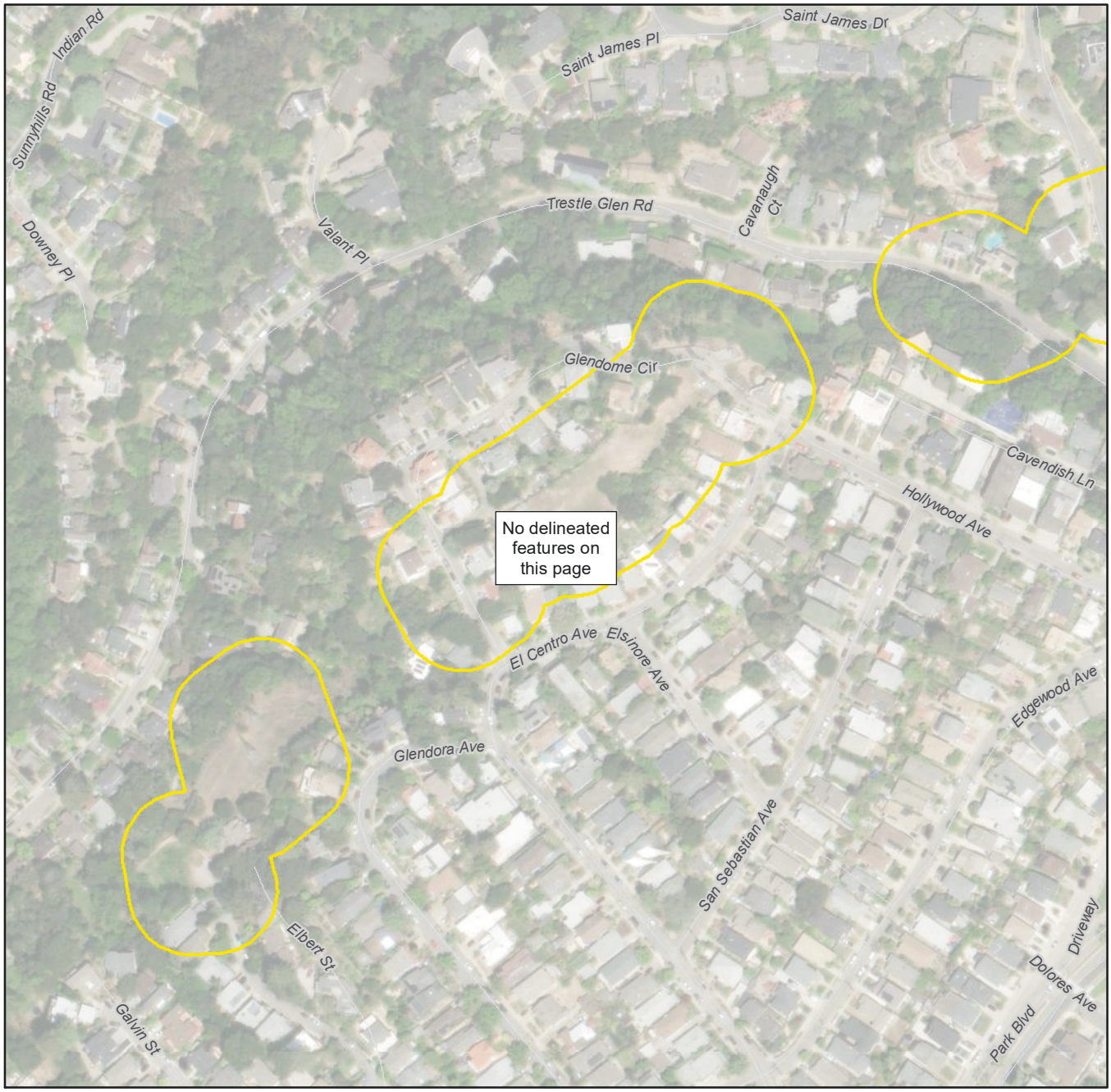

Version: 2/1/2024

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- Photo Location wtih View Direction
- Sample Point
- OHWM Transect
- Constructed Wetland/ Stormwater BMP

Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

N

0 250 500

Feet

Figure 5 Page 17 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
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Version: 2/1/2024

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- Constructed Wetland/ Stormwater BMP

Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

N

0 250 500

Feet

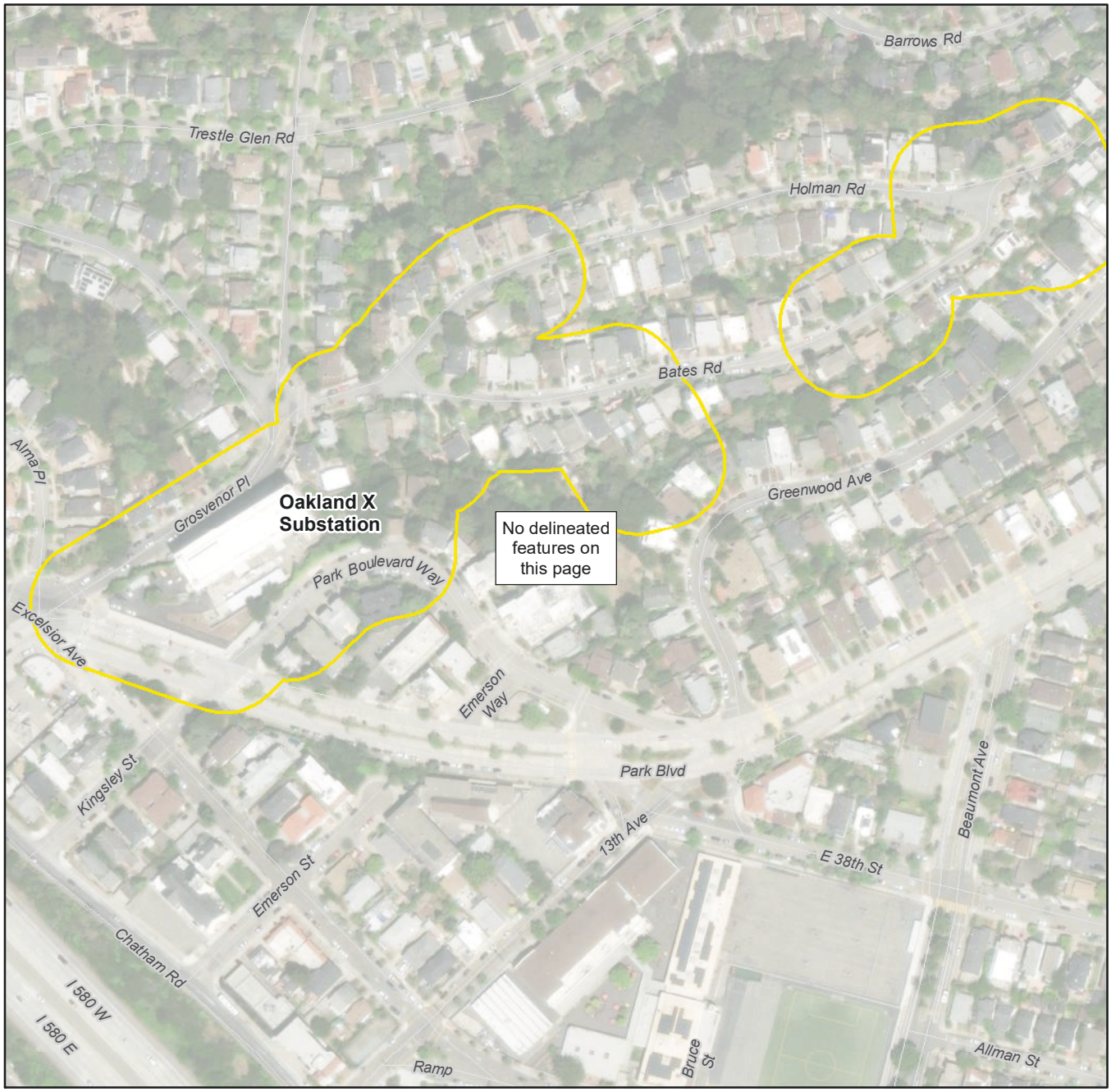
Figure 5 Page 18 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
ac = acres
lf = linear feet

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Jacobs

\\dc1vs01\gisproj\P\PGE\Moraga\D31321AV_MOX\MapFiles\Delineation\ARDR_Detail_240123.mxd kgrant1 2/1/2024 9:12:39 PM



Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 ac)
- Photo Location wtih View Direction
- Sample Point
- OHWM Transect
- Constructed Wetland/ Stormwater BMP

Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

N

0 250 500

Feet

Figure 5 Page 19 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
ac = acres
lf = linear feet

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Jacobs

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Version: 2/1/2024

Legend

- Aquatic Resources Study Area (226.3 ac)
- Photo Location wtih View Direction
- Sample Point
- OHWM Transect
- Constructed Wetland/ Stormwater BMP

Aquatic Resources

- Other Waters (0.387 ac; 2,159 lf)
- Wetlands (0.133 ac)
- Culverted Waters (1,514 lf)
- Flow Direction

N

0 250 500

Feet

Figure 5 Page 20 of 20
Aquatic Resources Delineation Map
Moraga-Oakland X 115 kV Rebuild Project
Pacific Gas & Electric Company

Notes:
ac = acres
lf = linear feet

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Jacobs

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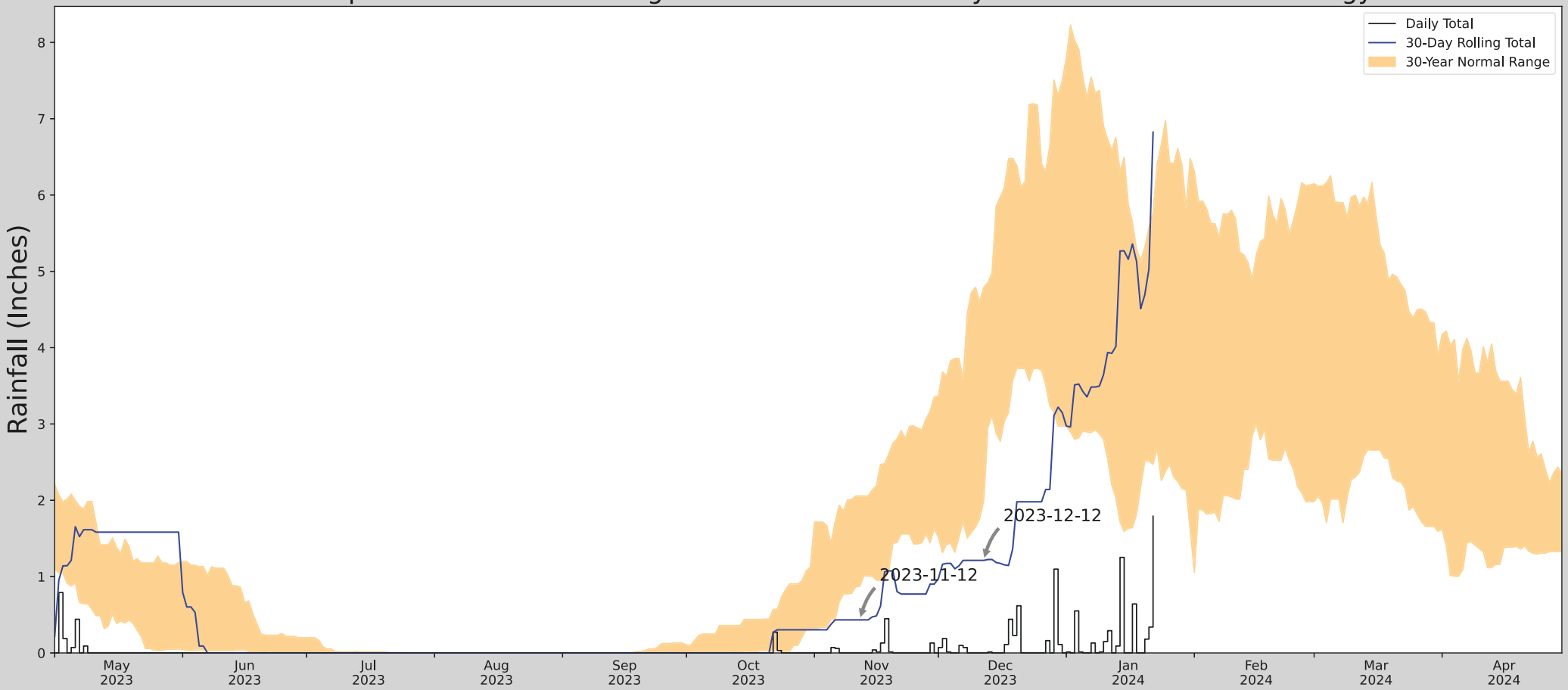
Appendix A
Antecedent Precipitation Tool Results

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	37.839862, -122.184449
Observation Date	2023-12-12
Elevation (ft)	912.082
Drought Index (PDSI)	Incipient wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-12-12	1.998032	4.789764	1.212598	Dry	1	3	3
2023-11-12	0.872441	2.057087	0.433071	Dry	1	2	2
2023-10-13	0.011811	0.359449	0.0	Dry	1	1	1
Result							Drier than Normal - 6

US Army Corps of Engineers

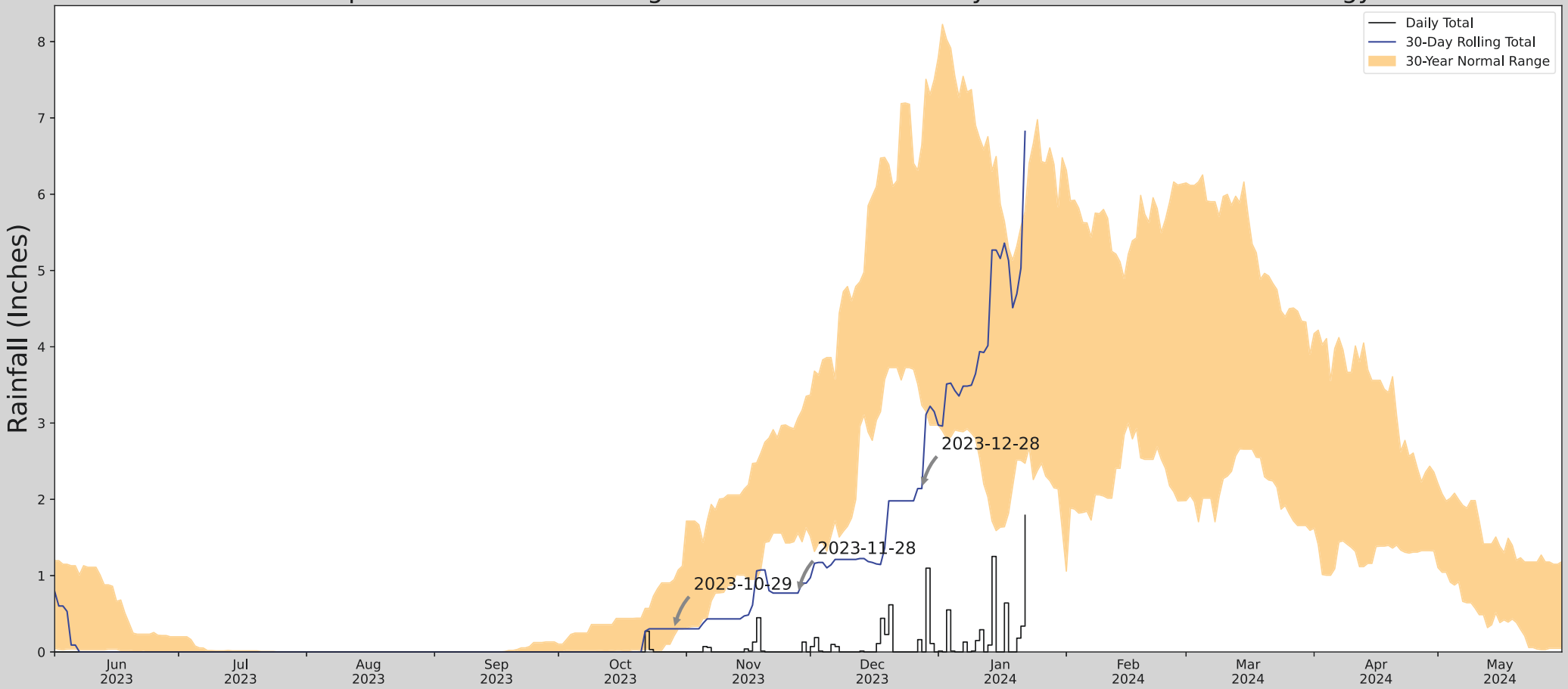
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
UPPER SAN LEANDRO FILTERS	37.7719, -122.1675	394.029	4.786	518.053	4.633	11075	90
OAKLAND 1.2 ENE	37.7778, -122.2032	116.142	1.992	277.887	1.45	30	0
PIEDMONT 1.0 SE	37.8123, -122.216	372.047	3.848	21.982	1.816	1	0
OAKLAND INTL AP	37.7178, -122.2331	4.921	5.179	389.108	4.346	212	0
OAKLAND MUSEUM	37.7983, -122.2642	29.856	5.587	364.173	4.549	34	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	37.839862, -122.184449
Observation Date	2023-12-28
Elevation (ft)	912.082
Drought Index (PDSI)	Incipient wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-12-28	3.232284	6.64567	2.141732	Dry	1	3	3
2023-11-28	1.55748	3.06378	0.771654	Dry	1	2	2
2023-10-29	0.211024	0.947244	0.30315	Normal	2	1	2
Result							Drier than Normal - 7

US Army Corps of Engineers

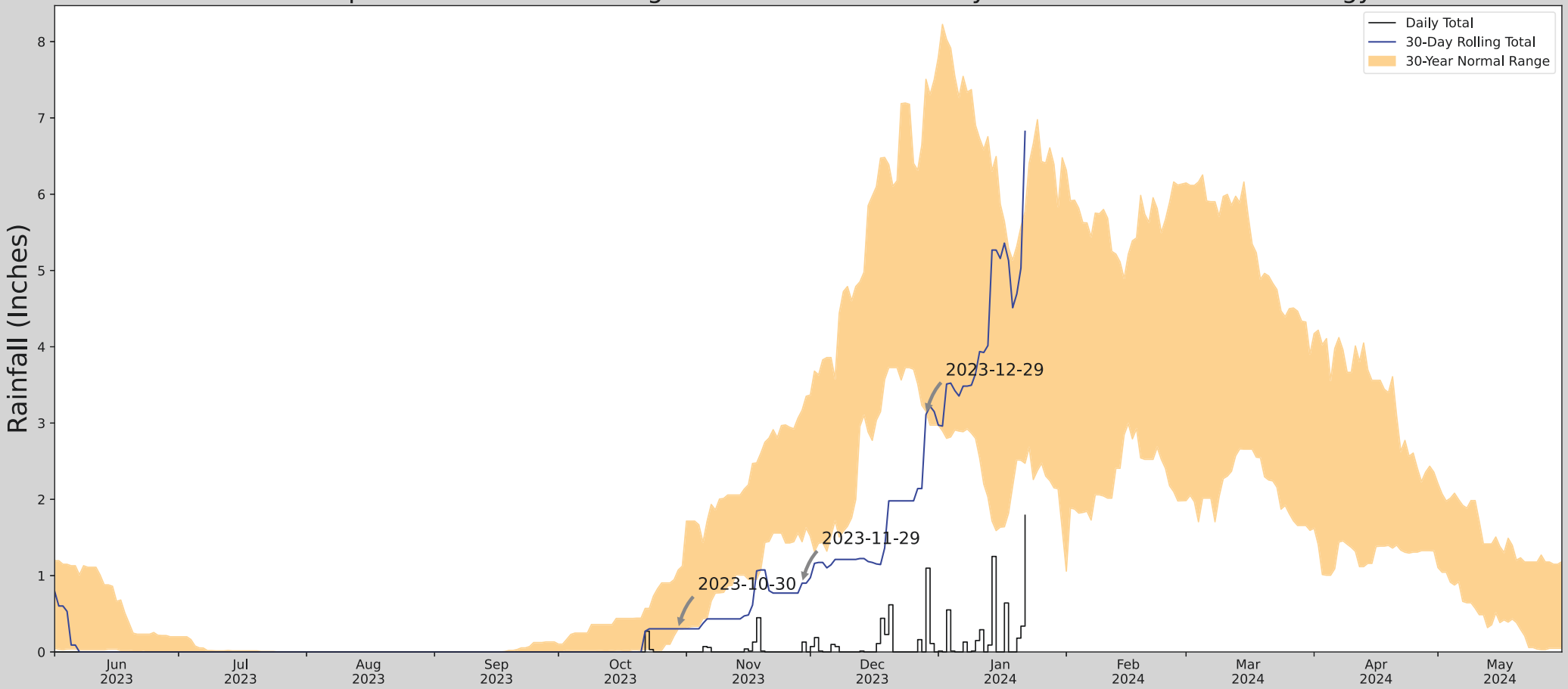
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
UPPER SAN LEANDRO FILTERS	37.7719, -122.1675	394.029	4.786	518.053	4.633	11075	90
OAKLAND 1.2 ENE	37.7778, -122.2032	116.142	1.992	277.887	1.45	30	0
PIEDMONT 1.0 SE	37.8123, -122.216	372.047	3.848	21.982	1.816	1	0
OAKLAND INTL AP	37.7178, -122.2331	4.921	5.179	389.108	4.346	212	0
OAKLAND MUSEUM	37.7983, -122.2642	29.856	5.587	364.173	4.549	34	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	37.839862, -122.184449
Observation Date	2023-12-29
Elevation (ft)	912.082
Drought Index (PDSI)	Incipient wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-12-29	3.155118	7.505906	3.110236	Dry	1	3	3
2023-11-29	1.444882	3.16811	0.901575	Dry	1	2	2
2023-10-30	0.302362	1.073228	0.30315	Normal	2	1	2
Result							Drier than Normal - 7

US Army Corps of Engineers

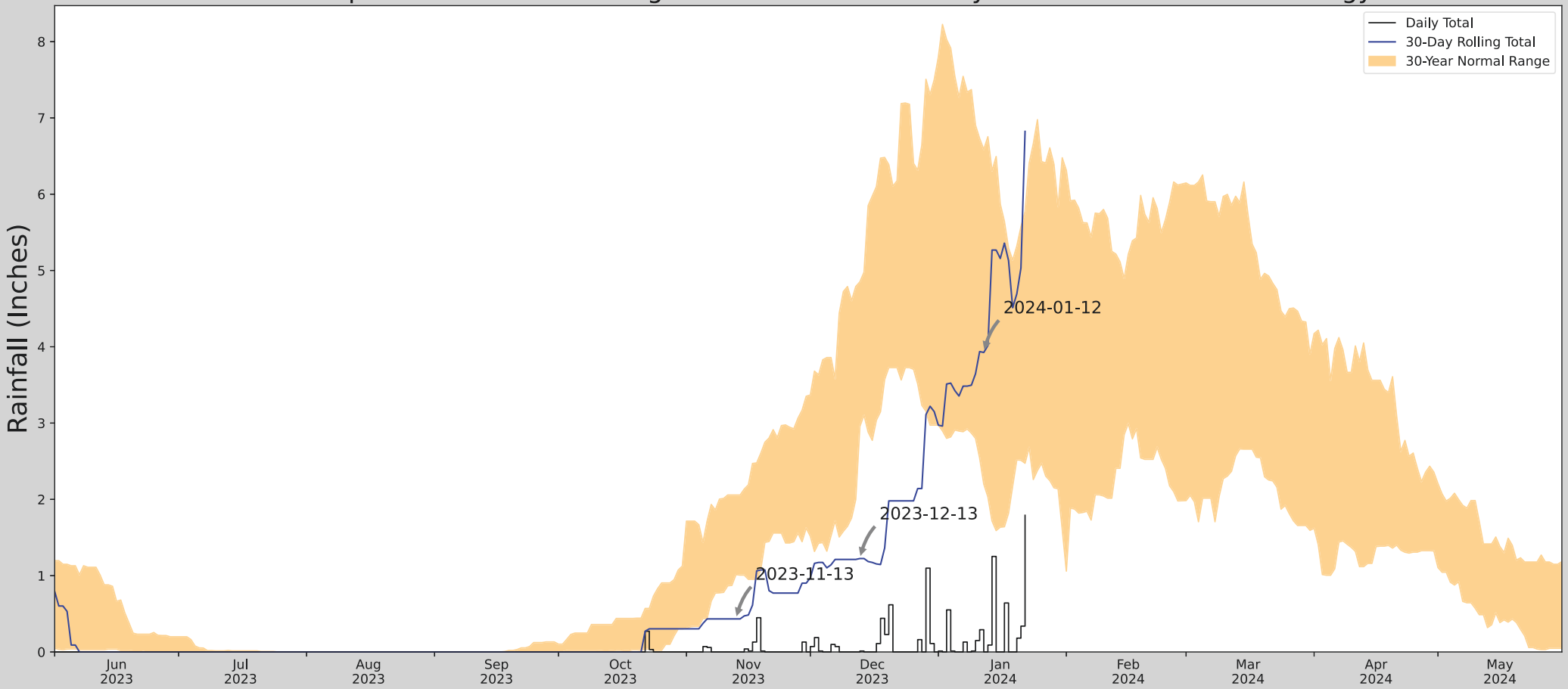
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
UPPER SAN LEANDRO FILTERS	37.7719, -122.1675	394.029	4.786	518.053	4.633	11075	90
OAKLAND 1.2 ENE	37.7778, -122.2032	116.142	1.992	277.887	1.45	30	0
PIEDMONT 1.0 SE	37.8123, -122.216	372.047	3.848	21.982	1.816	1	0
OAKLAND INTL AP	37.7178, -122.2331	4.921	5.179	389.108	4.346	212	0
OAKLAND MUSEUM	37.7983, -122.2642	29.856	5.587	364.173	4.549	34	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	37.839862, -122.184449
Observation Date	2024-01-12
Elevation (ft)	912.082
Drought Index (PDSI)	Not available
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-01-12	2.200787	6.587402	3.925197	Normal	2	3	6
2023-12-13	2.955906	4.850788	1.224409	Dry	1	2	2
2023-11-13	1.01378	2.057087	0.433071	Dry	1	1	1
Result							Drier than Normal - 9

US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
UPPER SAN LEANDRO FILTERS	37.7719, -122.1675	394.029	4.786	518.053	4.633	11075	78
OAKLAND 1.2 ENE	37.7778, -122.2032	116.142	1.992	277.887	1.45	30	12
PIEDMONT 1.0 SE	37.8123, -122.216	372.047	3.848	21.982	1.816	1	0
OAKLAND INTL AP	37.7178, -122.2331	4.921	5.179	389.108	4.346	212	0
OAKLAND MUSEUM	37.7983, -122.2642	29.856	5.587	364.173	4.549	34	0

Appendix B
Field Datasheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Moraga-Oakland X 115 kV Rebuild Project City/County: Orinda/Contra Costa County Sampling Date: 12/12/23

Applicant/Owner: PG&E State: CA Sampling Point: SP-1

Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee Section, Township, Range: T1S, 3W

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

Subregion (LRR): C Lat: 37.847159 Long: -122.162800 Datum: WGS 84

Soil Map Unit Name: Diablo clay, 15 to 30 percent slopes NWI classification:

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ 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:

Sampling point established in a steep swale dominated by hydrophytes.

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: 5 ft)			
1. Juncus patens	50	Y	FACW
2. Conium maculatum	30	Y	FACW
3. Polypogon monspeliensis	10	N	FACW
4. Helminthotheca echioides	10	N	FAC
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: SP-1

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
0-12	5Y 3/1	100					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)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Moraga-Oakland X 115 kV Rebuild Project City/County: Orinda/Contra Costa County Sampling Date: 12/12/23

Applicant/Owner: PG&E State: CA Sampling Point: SP-2

Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee Section, Township, Range: T1S, 3W

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR): C Lat: 37.8474180 Long: -122.1628288 Datum: WGS 84

Soil Map Unit Name: Diablo clay, 15 to 30 percent slopes NWI classification:

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ 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:

Sampling point established in a steep swale dominated by hydrophytes.

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: 5 ft)			
1. Juncus patens	50	Y	FACW
2. Leymus triticoides	50	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: SP-2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	5Y 3/1	100					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)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Moraga-Oakland X 115 kV Rebuild Project City/County: Orinda/Contra Costa County Sampling Date: 12/12/23

Applicant/Owner: PG&E State: CA Sampling Point: SP-3a

Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee Section, Township, Range: T1S, 3W

Landform (hillslope, terrace, etc.): Cut-fill slope Local relief (concave, convex, none): Convex Slope (%): 2

Subregion (LRR): C Lat: 37.8521816 Long: -122.1705107 Datum: WGS 84

Soil Map Unit Name: Diablo clay, 15 to 30 percent slopes NWI classification:

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

Are Vegetation _____, Soil ✓, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ 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:

Seep wetland adjacent to access road. Soils significantly disturbed by roadfill.

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: 5 ft)			
1. Cyperus eragrostis	80	Y	FACW
2. Polypogon monspeliensis	5	N	FACW
3. Poa sp.*	5	N	FAC
4.			
5.			
6.			
7.			
8.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Poa sp. assumed to be FAC.

SOIL

Sampling Point: SP-3a

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
0-4	10YR 4/1	90	7.5YR 4/4	10	D	M	loam	gravelly
4-8	10YR 3/1	100					loam	gravelly
8-12	5Y 3/1	100					loam	gravelly

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ **No** _____

Remarks:

Fill materials mixed in soil profile.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 6

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

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Moraga-Oakland X 115 kV Rebuild Project City/County: Orinda/Contra Costa County Sampling Date: 12/12/23

Applicant/Owner: PG&E State: CA Sampling Point: SP-3b

Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee Section, Township, Range: T1S, 3W

Landform (hillslope, terrace, etc.): Cut-fill slope Local relief (concave, convex, none): Convex Slope (%): 2

Subregion (LRR): C Lat: 37.852197 Long: -122.170548 Datum: WGS 84

Soil Map Unit Name: Diablo clay, 15 to 30 percent slopes NWI classification:

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

Are Vegetation _____, Soil ✓, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ 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:

Sampling point established as upland point to SP-3a adjacent to access road. Soils significantly disturbed by roadfill.

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 m)			
1. Baccharis pilularis	70	Y	NL
2. Salix lasiolepis	10	N	FACW
3.			
4.			
5.			
	80 = Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. Helminthotheca echioides	10	Y	FAC
2. Lotus corniculatus	5	Y	FAC
3. Unknow grass*	5	Y	FAC
4.			
5.			
6.			
7.			
8.			
	20 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 80 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

*Unknown grass assumed to be FAC.

SOIL

Sampling Point: SP-3b

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	5Y 3/1	100					silty clay	gravelly

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: Gravel and roadfill

Depth (inches): 10+

Hydric Soil Present? Yes _____ No ✓

Remarks:

Fill materials mixed in soil profile.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): 6

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Moraga-Oakland X 115 kV Rebuild Project City/County: Orinda/Contra Costa County Sampling Date: 12/28/23

Applicant/Owner: PG&E State: CA Sampling Point: SP-4a

Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee Section, Township, Range: T1S, 3W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3

Subregion (LRR): C Lat: 37.8428399 Long: -122.1771835 Datum: WGS 84

Soil Map Unit Name: Los Osos clay loam, 30 to 50 percent slopes NWI classification:

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ 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:

Seep sloped wetland from hillslope.

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.			
	80 = Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. Cyperus eragrostis	60	Y	FACW
2. Polypogon monspeliensis	20	Y	FACW
3. Lythrum hyssopifolium	5	N	OBL
4. Juncus sp.*	5	N	FAC
5. Trifolium sp.*	5	N	FAC
6. Mimulus guttatus	5	N	OBL
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 80 % Cover of Biotic Crust _____

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Most plants are not flowering making it difficult to key out to species. Juncus sp. is assumed to be FACW and Trifolium sp. is assumed to be FAC.

SOIL

Sampling Point: SP-4a

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	90	7.5YR 4/4	10	C	PL	clay loam	
5-9	10YR 3/2	98	7.5YR 4/4	2	C	PL	clay loam	
9-12	10YR 4/1	100					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)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): <1

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

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 5

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

Inflow from hillslope seep. Wetted from top-down.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Moraga-Oakland X 115 kV Rebuild Project City/County: Orinda/Contra Costa County Sampling Date: 12/28/23

Applicant/Owner: PG&E State: CA Sampling Point: SP-4b

Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee Section, Township, Range: T1S, 3W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2

Subregion (LRR): C Lat: 37.842829 Long: -122.177153 Datum: WGS 84

Soil Map Unit Name: Los Osos clay loam, 30 to 50 percent slopes NWI classification:

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ 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:

Upland point established for seep sloped wetland from hillslope.

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. Baccharis pilularis	10	Y	NL
2. Lupin albifrons	2	N	NL
3.			
4.			
5.			
	12 = Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. Unknow upland grass*	90	Y	FACU
2. Centaurea solstitialis	10	N	NL
3.			
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 80 % Cover of Biotic Crust _____

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	90	x 4 =	360
UPL species	22	x 5 =	110
Column Totals:	112 (A)		470 (B)

Prevalence Index = B/A = 4.20

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Most plants are not flowering making it difficult to key out to species. Unknown upland grass is assumed to be FACU.

SOIL

Sampling Point: SP-4b

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
0-12	10YR 3/2	100					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)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Moraga-Oakland X 115 kV Rebuild Project City/County: Orinda/Contra Costa County Sampling Date: 12/28/23

Applicant/Owner: PG&E State: CA Sampling Point: SP-5a

Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee Section, Township, Range: T1S, 3W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3

Subregion (LRR): C Lat: 37.8432391 Long: -122.1771980 Datum: WGS 84

Soil Map Unit Name: Los Osos clay loam, 30 to 50 percent slopes NWI classification:

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ 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:

Seep sloped wetland from hillslope.

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: 5 ft)			
1. Unknown graminoid	80	Y	FACW
2. Lythrum hyssopifolium	10	N	OBL
3. Mentha arvensis	5	N	FACW
4. Helminthotheca echioides	5	N	FAC
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

No seed head on unknown graminoid to key out to species, assumed FACW if not wetter.

SOIL

Sampling Point: SP-5a

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
0-3	10YR 3/1	98	7.5YR 4/4	2	C	PL	clay loam	
3-8	10YR 2/1	85	7.5YR 4/4	15	C	PL	clay loam	
8-12	10YR 2/1	100					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)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): <1

Water Table Present? Yes ✓ No _____ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 8

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

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

Remarks:

Appears to be ponding as well as shallow water table at 8 inches.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Moraga-Oakland X 115 kV Rebuild Project City/County: Orinda/Contra Costa County Sampling Date: 12/28/23

Applicant/Owner: PG&E State: CA Sampling Point: SP-5b

Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee Section, Township, Range: T1S, 3W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3

Subregion (LRR): C Lat: 37.843284 Long: -122.177128 Datum: WGS 84

Soil Map Unit Name: Los Osos clay loam, 30 to 50 percent slopes NWI classification:

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ 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:

Seep sloped wetland from hillslope.

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: 5 ft)			
1. Anthriscus caucalis	40	Y	NL
2. Conium maculatum	30	Y	FACW
3. Silybum marianum	10	N	NL
4. Carduus pycnocephalus	10	N	NL
5. Helminthotheca echioides	5	N	FAC
6. Unknown grass*	5	N	FAC
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 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	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	60	x 5 =	300
Column Totals:	100 (A)		390 (B)

Prevalence Index = B/A = 3.90

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

No seed head on unknown grass, assumed FAC.

SOIL

Sampling Point: SP-5b

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
0-12	10YR 3/2	100					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)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Moraga-Oakland X 115 kV Rebuild Project City/County: Orinda/Contra Costa County Sampling Date: 1/12/24

Applicant/Owner: PG&E State: CA Sampling Point: SP-6

Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee Section, Township, Range: T1S, 3W

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

Subregion (LRR): C Lat: 37.826995 Long: -122.203192 Datum: WGS 84

Soil Map Unit Name: Maymen loam, 30 to 75 percent slopes NWI classification:

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

Are Vegetation ✓, Soil ✓, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes ✓ 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:

Sampling point established on floodplain adjacent to constructed ephemeral drainage within managed native plant garden with presence of hydrophytic vegetation. Hydrophytic vegetation appeared to be planted as part of the managed native plant garden. Soils were disturbed with presence of filled and clayey materials mixed in the soil profile.

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 m)			
1. Heteromeles arbutifolia	25	Y	NL
2. Frangula californica	5	N	NL
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. Juncus patens	15	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	15 = Total Cover		
Woody Vine Stratum (Plot size: 1 m)			
1. Rubus ursinus	15	Y	FAC
2.			
	15 = Total Cover		

% Bare Ground in Herb Stratum 85 % Cover of Biotic Crust

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

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

Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No

Remarks:

Juncus patens appeared to be planted as part of the managed native plant garden.

SOIL

Sampling Point: SP-6

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					loam	
10-12	10YR 5/4	100					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)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** ✓

Remarks:

Soils appeared to disturbed; fill material mixed in soil profile.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

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

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

Remarks:

U.S. Army Corps of Engineers (USACE)

INTERIM DRAFT RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-COR.

Form Approved -
OMB No. 0710-0024
Expires: 2024-04-30

The Agency Disclosure Notice (ADN)

The Public reporting burden for this collection of information, 0710-0024, is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

Project ID #: MOX 115 kV Rebuild	Site Name: MOX 115 kV Rebuild	Date and Time: 12/12/23 9:42am
Location (lat/long): 37.846837, -122.161876	Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee	

Step 1 Site overview from remote and online resources

Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [x] geologic maps
- [x] climatic data
- [x] satellite imagery
- [x] land use maps
- [x] aerial photos
- [x] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources. Were there any recent extreme events (floods or drought)?

Land use is residential/open space.

Step 2 Site conditions during field assessment. First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

Intermittent stream nearby substation. There is a flood gate near the substation where the streams widened. Streambed is filled with cobbles and no vegetation. Change in vegetation observed on bank slope.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.

Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:** x
  - [ ] *on the bank:*
  - [ ] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: _____
- [ ] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [x] **Instream bedforms and other bedload transport evidence:** b
  - [x] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)* b
  - [x] *bedforms (e.g., pools, riffles, steps, etc.):* b
- [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [x] **Soil development:** a
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [x] **Changes in particle-sized distribution:**
  - [x] *transition from* cobbles to soil
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:** x

  Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

  - [x] *vegetation absent to:* forbs
  - [ ] *moss to:*
  - [x] *forbs to:* woody shrubs
  - [ ] *graminoids to:*
  - [x] *woody shrubs to:* deciduous trees
  - [ ] *deciduous trees to:*
  - [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [ ] **Exposed roots below intact soil layer:**

Ancillary indicators

- [x] **Wracking/presence of organic litter:** b
- [ ] **Presence of large wood:**
- [ ] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators? Describe:

Project ID #: MOX 115 kV Rebuild

Step 4 Is additional information needed to support this determination? ☐ Yes ☒ No If yes, describe and attach information to datasheet:

Step 5 Describe rationale for location of OHWM

OHWM is 8ft wide above the low flow channel. Streambed is filled with cobbles and transitioned into soil and vegetation at OHWM. A change in vegetation from absent to herbaceous and shrubs was observed.

Additional observations or notes

Top of bank is 15ft wide and was clearly defined.

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☒ Yes ☐ No If no, explain why not: _____

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
	Please see Appendix B.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 Site overview from remote and online resources **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 Site conditions during the field assessment (assemble evidence)

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a List evidence

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators
Where are the breaks in slope?
Are there identifiable banks?
Is there an easily identifiable top of bank?
Are the banks actively eroding?
Are the banks undercut?
Are the banks armored?
Is the channel confined by the surrounding hillslopes?
Are there natural or man-made berms and levees?
Are there fluvial terraces?
Are there channel bars?

Sediment and soil indicators
Where does evidence of soil formation appear?

Are there mudcracks present?

Is there evidence of sediment sorting by grain size?

Vegetation Indicators
Where are the significant transitions in vegetation species, density, and age?

Is there vegetation growing on the channel bed?

If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?

Where are the significant transitions in vegetation?

Is the vegetation tolerant of flowing water?

Has any vegetation been flattened by flowing water?

Ancillary indicators
Is there organic litter present?

Is there any leaf litter disturbed or washed away?

Is there large wood deposition?

Is there evidence of water staining?

Are the following features of fluvial transport present?
Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 3b **Weight each line of evidence and weigh body of evidence**

Weight each indicator by considering its importance based upon:

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
2. Droughts may cause field evidence of OHWM to be obscured, because there has been an extended time since the last high flow event. There can be overgrowth of vegetation or deposition of material from surrounding landscape that can obscure indicators.
3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
2. Does the indicator occur at the same elevation as other indicators?

c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

1. This can be difficult to determine for some indicators and may be specific to climatic region (in terms of persistence of vegetation) and history of land use or other natural disturbances.
2. Chapter 2, Chapter 6, and Chapter 7 of the OHWM field manual describes each indicator in detail and provides examples of areas where indicators are difficult to interpret.

d. Weigh body of evidence:

i. Combine weights: integrate the weighted line of evidence (relevance, strength, reliability) of each indicator.

ii. For each of the observed indicators, which are more heavily weighted? Where do high value indicators co-occur along the stream reach? Do they co-occur at a similar elevation along the banks relative to water surface (or channel bed if there is no water).

iii. On datasheet, select the indicators used to identify the OHWM. Information in Chapter 2 of the OHWM field manual provides descriptions of specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.

e. Take photographs of indicators and attach a log using either page 2 of datasheet or another method of logging photos.

i. Annotate photos with descriptions of indicators.

Step 4 **Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?**

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

b. Any data collected from online tools have strengths and weaknesses. Make sure these are clear when determining relevance, strength, and reliability of the remotely collected data. Clearly describe why other resources were needed to support the lines of evidence observed in the field, as well as the relevance, strength, and reliability of the supporting data and/or resources.

c. Attach any remote data and data analysis to the datasheet.

Step 5 **Describe rationale for location of OHWM:**

a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilities for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

U.S. Army Corps of Engineers (USACE)

INTERIM DRAFT RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-COR.

Form Approved -
OMB No. 0710-0024
Expires: 2024-04-30

The Agency Disclosure Notice (ADN)

The Public reporting burden for this collection of information, 0710-0024, is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

Project ID #: MOX 115 kV Rebuild	Site Name: MOX 115 kV Rebuild	Date and Time: 12/12/23
Location (lat/long): 37.8504128, -122.1693656	Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee	

Step 1 Site overview from remote and online resources
Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [x] geologic maps
- [x] climatic data
- [x] satellite imagery
- [x] land use maps
- [x] aerial photos
- [x] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources. Were there any recent extreme events (floods or drought)?
Land use is recreation space owned by East Bay Parks.

Step 2 Site conditions during field assessment. First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.
Ephemeral drainage connected by culverts.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.
OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.
Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:** x
  - [x] *on the bank:* x
  - [ ] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: _____
- [ ] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [ ] **Instream bedforms and other bedload transport evidence:** b
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)* b
  - [ ] *bedforms (e.g., pools, riffles, steps, etc.):* b
- [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [x] **Soil development:** a
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [x] **Changes in particle-sized distribution:** x
  - [x] *transition from* cobbles to soil
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:** x

Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

- [x] *vegetation absent to:* woody shrubs
- [ ] *moss to:*
- [ ] *forbs to:*
- [ ] *graminoids to:*
- [ ] *woody shrubs to:*
- [ ] *deciduous trees to:*
- [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [ ] **Exposed roots below intact soil layer:**

Ancillary indicators

- [ ] **Wracking/presence of organic litter:**
- [ ] **Presence of large wood:**
- [ ] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators? Describe:

Project ID #: MOX 115 kV Rebuild

Step 4 Is additional information needed to support this determination? ☐ Yes ☒ No If yes, describe and attach information to datasheet:

Step 5 Describe rationale for location of OHWM

OHWM is 8ft wide above the low flow channel. Streambed is filled with cobbles and transitioned into soil and vegetation at OHWM. A change in vegetation from absent to herbaceous and shrubs was observed.

Additional observations or notes

Top of bank is 14ft wide and was clearly defined.

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☒ Yes ☐ No If no, explain why not: _____

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
	Please see Appendix B.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 Site overview from remote and online resources **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 Site conditions during the field assessment (assemble evidence)

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a List evidence

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators
Where are the breaks in slope?
Are there identifiable banks?
Is there an easily identifiable top of bank?
Are the banks actively eroding?
Are the banks undercut?
Are the banks armored?
Is the channel confined by the surrounding hillslopes?
Are there natural or man-made berms and levees?
Are there fluvial terraces?
Are there channel bars?

Sediment and soil indicators
Where does evidence of soil formation appear?

Are there mudcracks present?

Is there evidence of sediment sorting by grain size?

Vegetation Indicators
Where are the significant transitions in vegetation species, density, and age?

Is there vegetation growing on the channel bed?

If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?

Where are the significant transitions in vegetation?

Is the vegetation tolerant of flowing water?

Has any vegetation been flattened by flowing water?

Ancillary indicators
Is there organic litter present?

Is there any leaf litter disturbed or washed away?

Is there large wood deposition?

Is there evidence of water staining?

Are the following features of fluvial transport present?
Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 3b **Weight each line of evidence and weigh body of evidence**

Weight each indicator by considering its importance based upon:

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
2. Droughts may cause field evidence of OHWM to be obscured, because there has been an extended time since the last high flow event. There can be overgrowth of vegetation or deposition of material from surrounding landscape that can obscure indicators.
3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
2. Does the indicator occur at the same elevation as other indicators?

c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

1. This can be difficult to determine for some indicators and may be specific to climatic region (in terms of persistence of vegetation) and history of land use or other natural disturbances.
2. Chapter 2, Chapter 6, and Chapter 7 of the OHWM field manual describes each indicator in detail and provides examples of areas where indicators are difficult to interpret.

d. Weigh body of evidence:

i. Combine weights: integrate the weighted line of evidence (relevance, strength, reliability) of each indicator.

ii. For each of the observed indicators, which are more heavily weighted? Where do high value indicators co-occur along the stream reach? Do they co-occur at a similar elevation along the banks relative to water surface (or channel bed if there is no water).

iii. On datasheet, select the indicators used to identify the OHWM. Information in Chapter 2 of the OHWM field manual provides descriptions of specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.

e. Take photographs of indicators and attach a log using either page 2 of datasheet or another method of logging photos.

i. Annotate photos with descriptions of indicators.

Step 4 **Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?**

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

b. Any data collected from online tools have strengths and weaknesses. Make sure these are clear when determining relevance, strength, and reliability of the remotely collected data. Clearly describe why other resources were needed to support the lines of evidence observed in the field, as well as the relevance, strength, and reliability of the supporting data and/or resources.

c. Attach any remote data and data analysis to the datasheet.

Step 5 **Describe rationale for location of OHWM:**

a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilities for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

U.S. Army Corps of Engineers (USACE)

INTERIM DRAFT RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-COR.

Form Approved -
OMB No. 0710-0024
Expires: 2024-04-30

The Agency Disclosure Notice (ADN)

The Public reporting burden for this collection of information, 0710-0024, is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

Project ID #: MOX 115 kV Rebuild	Site Name: OHWM-3	Date and Time: 12/28/23
Location (lat/long): 37.843435, -122.180461	Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee	

Step 1 Site overview from remote and online resources

Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [x] geologic maps
- [x] climatic data
- [x] satellite imagery
- [x] land use maps
- [x] aerial photos
- [x] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources. Were there any recent extreme events (floods or drought)?

Land use is recreation space owned by East Bay Parks. Recently daylighted/restored creek. Stream flow present from recent rain.

Step 2 Site conditions during field assessment. First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

Constructed/restored channel lined with angular rock to OHWM elevation.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.

Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:** x
  - [x] *on the bank:* x
  - [ ] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: _____
- [ ] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [ ] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., pools, riffles, steps, etc.):*
- [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [x] **Changes in particle-sized distribution:** x
  - [x] *transition from* boulder to soil
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:** b

  Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

  - [x] *vegetation absent to:* forbs
  - [ ] *moss to:*
  - [x] *forbs to:* woody shrubs
  - [ ] *graminoids to:*
  - [ ] *woody shrubs to:*
  - [ ] *deciduous trees to:*
  - [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [ ] **Exposed roots below intact soil layer:**

Ancillary indicators

- [ ] **Wracking/presence of organic litter:**
- [ ] **Presence of large wood:**
- [ ] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators? Describe:

Bed is artificially coarse which limits observation of bedload transport. Materials smaller and gravels are mobile.

Project ID #: MOX 115 kV Rebuild

Step 4 Is additional information needed to support this determination? ☐ Yes ☒ No If yes, describe and attach information to datasheet:

Step 5 Describe rationale for location of OHWM

Recently constructed creek with well-defined bed and bank. Large angular material defines the limits of OHWM along with recent scour.

Additional observations or notes

Top of bank is 35ft, OHWM is 14ft.

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☒ Yes ☐ No If no, explain why not: _____

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
	Please see Appendix B.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 **Site overview from remote and online resources** **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 **Site conditions during the field assessment (assemble evidence)**

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a **List evidence**

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators	**Sediment and soil indicators**	**Vegetation Indicators**	**Ancillary indicators**
Where are the breaks in slope?	Where does evidence of soil formation appear?	Where are the significant transitions in vegetation species, density, and age?	Is there organic litter present?
Are there identifiable banks?		Is there vegetation growing on the channel bed?	
Is there an easily identifiable top of bank?	Are there mudcracks present?	If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?	Is there any leaf litter disturbed or washed away?
Are the banks actively eroding?			
Are the banks undercut?	Is there evidence of sediment sorting by grain size?	Where are the significant transitions in vegetation?	Is there large wood deposition?
Are the banks armored?			
Is the channel confined by the surrounding hillslopes?		Is the vegetation tolerant of flowing water?	Is there evidence of water staining?
Are there natural or man-made berms and levees?		Has any vegetation been flattened by flowing water?	
Are there fluvial terraces?			
Are there channel bars?			

Are the following features of fluvial transport present?

Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 3b **Weight each line of evidence and weigh body of evidence**

Weight each indicator by considering its importance based upon:

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
2. Droughts may cause field evidence of OHWM to be obscured, because there has been an extended time since the last high flow event. There can be overgrowth of vegetation or deposition of material from surrounding landscape that can obscure indicators.
3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
2. Does the indicator occur at the same elevation as other indicators?

c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

1. This can be difficult to determine for some indicators and may be specific to climatic region (in terms of persistence of vegetation) and history of land use or other natural disturbances.
2. Chapter 2, Chapter 6, and Chapter 7 of the OHWM field manual describes each indicator in detail and provides examples of areas where indicators are difficult to interpret.

d. Weigh body of evidence:

i. Combine weights: integrate the weighted line of evidence (relevance, strength, reliability) of each indicator.

ii. For each of the observed indicators, which are more heavily weighted? Where do high value indicators co-occur along the stream reach? Do they co-occur at a similar elevation along the banks relative to water surface (or channel bed if there is no water).

iii. On datasheet, select the indicators used to identify the OHWM. Information in Chapter 2 of the OHWM field manual provides descriptions of specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.

e. Take photographs of indicators and attach a log using either page 2 of datasheet or another method of logging photos.

i. Annotate photos with descriptions of indicators.

Step 4 **Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?**

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

b. Any data collected from online tools have strengths and weaknesses. Make sure these are clear when determining relevance, strength, and reliability of the remotely collected data. Clearly describe why other resources were needed to support the lines of evidence observed in the field, as well as the relevance, strength, and reliability of the supporting data and/or resources.

c. Attach any remote data and data analysis to the datasheet.

Step 5 **Describe rationale for location of OHWM:**

a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilities for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

U.S. Army Corps of Engineers (USACE)

INTERIM DRAFT RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-COR.

Form Approved -
OMB No. 0710-0024
Expires: 2024-04-30

The Agency Disclosure Notice (ADN)

The Public reporting burden for this collection of information, 0710-0024, is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

Project ID #: MOX 115 kV Rebuild	Site Name: OHWM-4	Date and Time: 12/29/23
Location (lat/long): 37.849249, -122.174820	Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee	

Step 1 Site overview from remote and online resources

Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [x] geologic maps
- [x] climatic data
- [x] satellite imagery
- [x] land use maps
- [x] aerial photos
- [x] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources. Were there any recent extreme events (floods or drought)?

Land use is recreation space owned by East Bay Parks. Flow is absent during survey.

Step 2 Site conditions during field assessment. First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

Waters on west and east side of existing roadway. Unclear if culvert is buried. No flow during visit.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.

Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:** x
  - [x] *on the bank:* x
  - [ ] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: _____
- [ ] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [ ] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., pools, riffles, steps, etc.):*
- [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [ ] **Changes in particle-sized distribution:**
  - [ ] *transition from* _____ to _____
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:** x

  Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

  - [x] *vegetation absent to:* forbs
  - [ ] *moss to:*
  - [ ] *forbs to:*
  - [ ] *graminoids to:*
  - [ ] *woody shrubs to:*
  - [ ] *deciduous trees to:*
  - [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [x] **Exposed roots below intact soil layer:** a

Ancillary indicators

- [ ] **Wracking/presence of organic litter:**
- [ ] **Presence of large wood:**
- [x] **Leaf litter disturbed or washed away:** b
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators? Describe:

Project ID #: MOX 115 kV Rebuild

Step 4 Is additional information needed to support this determination? ☐ Yes ☒ No If yes, describe and attach information to datasheet:

Step 5 Describe rationale for location of OHWM

Steep ephemeral waters on headwater of drainage.

Additional observations or notes

Top of bank is 8ft, OHWM is 2ft.

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☒ Yes ☐ No If no, explain why not: _____

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
	Please see Appendix B.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 Site overview from remote and online resources **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 Site conditions during the field assessment (assemble evidence)

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a List evidence

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators
Where are the breaks in slope?
Are there identifiable banks?
Is there an easily identifiable top of bank?
Are the banks actively eroding?
Are the banks undercut?
Are the banks armored?
Is the channel confined by the surrounding hillslopes?
Are there natural or man-made berms and levees?
Are there fluvial terraces?
Are there channel bars?

Sediment and soil indicators
Where does evidence of soil formation appear?

Are there mudcracks present?

Is there evidence of sediment sorting by grain size?

Vegetation Indicators
Where are the significant transitions in vegetation species, density, and age?

Is there vegetation growing on the channel bed?

If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?

Where are the significant transitions in vegetation?

Is the vegetation tolerant of flowing water?

Has any vegetation been flattened by flowing water?

Ancillary indicators
Is there organic litter present?

Is there any leaf litter disturbed or washed away?

Is there large wood deposition?

Is there evidence of water staining?

Are the following features of fluvial transport present?
Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 3b **Weight each line of evidence and weigh body of evidence**

Weight each indicator by considering its importance based upon:

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
2. Droughts may cause field evidence of OHWM to be obscured, because there has been an extended time since the last high flow event. There can be overgrowth of vegetation or deposition of material from surrounding landscape that can obscure indicators.
3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
2. Does the indicator occur at the same elevation as other indicators?

c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

1. This can be difficult to determine for some indicators and may be specific to climatic region (in terms of persistence of vegetation) and history of land use or other natural disturbances.
2. Chapter 2, Chapter 6, and Chapter 7 of the OHWM field manual describes each indicator in detail and provides examples of areas where indicators are difficult to interpret.

d. Weigh body of evidence:

i. Combine weights: integrate the weighted line of evidence (relevance, strength, reliability) of each indicator.

ii. For each of the observed indicators, which are more heavily weighted? Where do high value indicators co-occur along the stream reach? Do they co-occur at a similar elevation along the banks relative to water surface (or channel bed if there is no water).

iii. On datasheet, select the indicators used to identify the OHWM. Information in Chapter 2 of the OHWM field manual provides descriptions of specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.

e. Take photographs of indicators and attach a log using either page 2 of datasheet or another method of logging photos.

i. Annotate photos with descriptions of indicators.

Step 4 **Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?**

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

b. Any data collected from online tools have strengths and weaknesses. Make sure these are clear when determining relevance, strength, and reliability of the remotely collected data. Clearly describe why other resources were needed to support the lines of evidence observed in the field, as well as the relevance, strength, and reliability of the supporting data and/or resources.

c. Attach any remote data and data analysis to the datasheet.

Step 5 **Describe rationale for location of OHWM:**

a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilities for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

U.S. Army Corps of Engineers (USACE)

INTERIM DRAFT RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-COR.

Form Approved -
OMB No. 0710-0024
Expires: 2024-04-30

The Agency Disclosure Notice (ADN)

The Public reporting burden for this collection of information, 0710-0024, is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

Project ID #: MOX 115 kV Rebuild	Site Name: OHWM-5	Date and Time: 12/29/23
Location (lat/long): 37.818544, -122.206786	Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee	

Step 1 Site overview from remote and online resources

Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [x] geologic maps
- [x] climatic data
- [x] satellite imagery
- [x] land use maps
- [x] aerial photos
- [x] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources. Were there any recent extreme events (floods or drought)?

Flow is present during survey.

Step 2 Site conditions during field assessment. First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

Tributary of Palo Seco Creek near culvert. Flow present during survey.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.

Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:** x
  - [x] *on the bank:* x
  - [ ] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: _____
- [x] **Shelving:** b
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [x] **Channel bar:** b
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [x] *vegetation transition (go to veg. indicators)* x
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [x] **Instream bedforms and other bedload transport evidence:**
  - [x] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)* b
  - [x] *bedforms (e.g., pools, riffles, steps, etc.):* b
- [x] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)* b
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [ ] **Changes in particle-sized distribution:**
  - [ ] *transition from* _____ to _____
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:** a

  Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

  - [x] *vegetation absent to:* forbs
  - [ ] *moss to:*
  - [ ] *forbs to:*
  - [ ] *graminoids to:*
  - [ ] *woody shrubs to:*
  - [ ] *deciduous trees to:*
  - [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [ ] **Exposed roots below intact soil layer:**

Ancillary indicators

- [ ] **Wracking/presence of organic litter:**
- [ ] **Presence of large wood:**
- [ ] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators? Describe:

Project ID #: MOX 115 kV Rebuild

Step 4 Is additional information needed to support this determination? ☐ Yes ☒ No If yes, describe and attach information to datasheet:

Step 5 Describe rationale for location of OHWM

Vegetation change from low flow channel (no vegetation) to dense ivy at and above OHWM. Scour on left bank and point bar on right bank. OHWM is above scour and bar.

Additional observations or notes

Top of bank is 25ft, OHWM is 8ft.

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☒ Yes ☐ No If no, explain why not: _____

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
	Please see Appendix B.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 Site overview from remote and online resources **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 Site conditions during the field assessment (assemble evidence)

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a List evidence

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators
Where are the breaks in slope?
Are there identifiable banks?
Is there an easily identifiable top of bank?
Are the banks actively eroding?
Are the banks undercut?
Are the banks armored?
Is the channel confined by the surrounding hillslopes?
Are there natural or man-made berms and levees?
Are there fluvial terraces?
Are there channel bars?

Sediment and soil indicators
Where does evidence of soil formation appear?

Are there mudcracks present?

Is there evidence of sediment sorting by grain size?

Vegetation Indicators
Where are the significant transitions in vegetation species, density, and age?

Is there vegetation growing on the channel bed?

If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?

Where are the significant transitions in vegetation?

Is the vegetation tolerant of flowing water?

Has any vegetation been flattened by flowing water?

Ancillary indicators
Is there organic litter present?

Is there any leaf litter disturbed or washed away?

Is there large wood deposition?

Is there evidence of water staining?

Are the following features of fluvial transport present?
Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 3b **Weight each line of evidence and weigh body of evidence**

Weight each indicator by considering its importance based upon:

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
2. Droughts may cause field evidence of OHWM to be obscured, because there has been an extended time since the last high flow event. There can be overgrowth of vegetation or deposition of material from surrounding landscape that can obscure indicators.
3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
2. Does the indicator occur at the same elevation as other indicators?

c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

1. This can be difficult to determine for some indicators and may be specific to climatic region (in terms of persistence of vegetation) and history of land use or other natural disturbances.
2. Chapter 2, Chapter 6, and Chapter 7 of the OHWM field manual describes each indicator in detail and provides examples of areas where indicators are difficult to interpret.

d. Weigh body of evidence:

i. Combine weights: integrate the weighted line of evidence (relevance, strength, reliability) of each indicator.

ii. For each of the observed indicators, which are more heavily weighted? Where do high value indicators co-occur along the stream reach? Do they co-occur at a similar elevation along the banks relative to water surface (or channel bed if there is no water).

iii. On datasheet, select the indicators used to identify the OHWM. Information in Chapter 2 of the OHWM field manual provides descriptions of specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.

e. Take photographs of indicators and attach a log using either page 2 of datasheet or another method of logging photos.

i. Annotate photos with descriptions of indicators.

Step 4 **Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?**

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

b. Any data collected from online tools have strengths and weaknesses. Make sure these are clear when determining relevance, strength, and reliability of the remotely collected data. Clearly describe why other resources were needed to support the lines of evidence observed in the field, as well as the relevance, strength, and reliability of the supporting data and/or resources.

c. Attach any remote data and data analysis to the datasheet.

Step 5 **Describe rationale for location of OHWM:**

a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilities for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

U.S. Army Corps of Engineers (USACE)

INTERIM DRAFT RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-COR.

Form Approved -
OMB No. 0710-0024
Expires: 2024-04-30

The Agency Disclosure Notice (ADN)

The Public reporting burden for this collection of information, 0710-0024, is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

Project ID #: MOX 115 kV Rebuild	Site Name: OHWM-6	Date and Time: 1/12/24
Location (lat/long): 37.835654, -122.191024	Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee	

Step 1 Site overview from remote and online resources

Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [x] geologic maps
- [x] climatic data
- [x] satellite imagery
- [x] land use maps
- [x] aerial photos
- [x] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources. Were there any recent extreme events (floods or drought)?

Intermittent stream with low flow during visit.

Step 2 Site conditions during field assessment. First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

Strean downslope on steep slope into a culvert inlet near roadway. Culvert inlet was concrete lined.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.

Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:** x
  - [x] *on the bank:* x
  - [ ] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: _____
- [ ] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [ ] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., pools, riffles, steps, etc.):*
- [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Vegetation Indicators

- [x] **Change in vegetation type and/or density:** a

  Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

  - [x] *vegetation absent to:* forbs
  - [ ] *moss to:*
  - [ ] *forbs to:*
  - [ ] *graminoids to:*
  - [ ] *woody shrubs to:*
  - [ ] *deciduous trees to:*
  - [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**

Sediment indicators

- [x] **Soil development:** a
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [ ] **Changes in particle-sized distribution:**
  - [ ] *transition from* _____ to _____
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*
- [ ] **Exposed roots below intact soil layer:**

Ancillary indicators

- [x] **Wracking/presence of organic litter:** x
- [ ] **Presence of large wood:**
- [x] **Leaf litter disturbed or washed away:** b
- [x] **Water staining:** b
- [ ] **Weathered clasts or bedrock:**

Other observed indicators? Describe:

Project ID #: MOX 115 kV Rebuild

Step 4 Is additional information needed to support this determination? ☐ Yes ☒ No If yes, describe and attach information to datasheet:

Step 5 Describe rationale for location of OHWM

Riverine feature mapped on NWI. Upon field investigation, a stream and culvert was observed with active flow. Low flow stream was active.

Additional observations or notes

Top of bank is 8ft, OHWM is 3ft.

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☒ Yes ☐ No If no, explain why not: _____

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
	Please see Appendix B.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 **Site overview from remote and online resources** **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 **Site conditions during the field assessment (assemble evidence)**

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a **List evidence**

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators	**Sediment and soil indicators**	**Vegetation Indicators**	**Ancillary indicators**
Where are the breaks in slope?	Where does evidence of soil formation appear?	Where are the significant transitions in vegetation species, density, and age?	Is there organic litter present?
Are there identifiable banks?		Is there vegetation growing on the channel bed?	
Is there an easily identifiable top of bank?	Are there mudcracks present?	If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?	Is there any leaf litter disturbed or washed away?
Are the banks actively eroding?			
Are the banks undercut?	Is there evidence of sediment sorting by grain size?	Where are the significant transitions in vegetation?	Is there large wood deposition?
Are the banks armored?			
Is the channel confined by the surrounding hillslopes?		Is the vegetation tolerant of flowing water?	Is there evidence of water staining?
Are there natural or man-made berms and levees?		Has any vegetation been flattened by flowing water?	
Are there fluvial terraces?			
Are there channel bars?			

Are the following features of fluvial transport present?

Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 3b **Weight each line of evidence and weigh body of evidence**

Weight each indicator by considering its importance based upon:

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
2. Droughts may cause field evidence of OHWM to be obscured, because there has been an extended time since the last high flow event. There can be overgrowth of vegetation or deposition of material from surrounding landscape that can obscure indicators.
3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
2. Does the indicator occur at the same elevation as other indicators?

c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

1. This can be difficult to determine for some indicators and may be specific to climatic region (in terms of persistence of vegetation) and history of land use or other natural disturbances.
2. Chapter 2, Chapter 6, and Chapter 7 of the OHWM field manual describes each indicator in detail and provides examples of areas where indicators are difficult to interpret.

d. Weigh body of evidence:

i. Combine weights: integrate the weighted line of evidence (relevance, strength, reliability) of each indicator.

ii. For each of the observed indicators, which are more heavily weighted? Where do high value indicators co-occur along the stream reach? Do they co-occur at a similar elevation along the banks relative to water surface (or channel bed if there is no water).

iii. On datasheet, select the indicators used to identify the OHWM. Information in Chapter 2 of the OHWM field manual provides descriptions of specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.

e. Take photographs of indicators and attach a log using either page 2 of datasheet or another method of logging photos.

i. Annotate photos with descriptions of indicators.

Step 4 **Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?**

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

b. Any data collected from online tools have strengths and weaknesses. Make sure these are clear when determining relevance, strength, and reliability of the remotely collected data. Clearly describe why other resources were needed to support the lines of evidence observed in the field, as well as the relevance, strength, and reliability of the supporting data and/or resources.

c. Attach any remote data and data analysis to the datasheet.

Step 5 **Describe rationale for location of OHWM:**

a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilities for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

U.S. Army Corps of Engineers (USACE)

INTERIM DRAFT RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-COR.

Form Approved -
OMB No. 0710-0024
Expires: 2024-04-30

The Agency Disclosure Notice (ADN)

The Public reporting burden for this collection of information, 0710-0024, is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

Project ID #: MOX 115 kV Rebuild	Site Name: OHWM-7	Date and Time: 1/12/24
Location (lat/long): 37.8259909, -122.2022160	Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee	

Step 1 Site overview from remote and online resources

Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [x] geologic maps
- [x] climatic data
- [x] satellite imagery
- [x] land use maps
- [x] aerial photos
- [x] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources. Were there any recent extreme events (floods or drought)?

Intermittent stream near Shepherd Canyon Park.

Step 2 Site conditions during field assessment. First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

Lots of woody debris present in stream and between TOB and OHWM.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.

Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:** x
  - [x] *on the bank:* x
  - [ ] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: _____
- [ ] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [x] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [x] *bedforms (e.g., pools, riffles, steps, etc.):* x
- [x] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)* b
- [ ] **Secondary channels:**

Sediment indicators

- [x] **Soil development:** a
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [ ] **Changes in particle-sized distribution:**
  - [ ] *transition from* _____ to _____
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:** a

  Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

  - [x] *vegetation absent to:* forbs
  - [ ] *moss to:*
  - [x] *forbs to:* coniferous trees
  - [ ] *graminoids to:*
  - [ ] *woody shrubs to:*
  - [ ] *deciduous trees to:*
  - [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [x] **Exposed roots below intact soil layer:** a

Ancillary indicators

- [x] **Wracking/presence of organic litter:** x
- [x] **Presence of large wood:** x
- [x] **Leaf litter disturbed or washed away:** x
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators? Describe:

Project ID #: MOX 115 kV Rebuild

Step 4 Is additional information needed to support this determination? ☐ Yes ☒ No If yes, describe and attach information to datasheet:

Step 5 Describe rationale for location of OHWM

Feature mapped on NHD seems to be accurate showing presence of Shepherd Creek. Field investigation verify existing intermittent stream (Shepherd Creek) with defined bed and bank, vegetation change, abd presence of rocky substrates and boulders.

Additional observations or notes

Top of bank width (in ft) varies, OHWM is varies from 3-7 ft.

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☒ Yes ☐ No If no, explain why not: _____

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
	Please see Appendix B.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 Site overview from remote and online resources **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 Site conditions during the field assessment (assemble evidence)

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a List evidence

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators
Where are the breaks in slope?
Are there identifiable banks?
Is there an easily identifiable top of bank?
Are the banks actively eroding?
Are the banks undercut?
Are the banks armored?
Is the channel confined by the surrounding hillslopes?
Are there natural or man-made berms and levees?
Are there fluvial terraces?
Are there channel bars?

Sediment and soil indicators
Where does evidence of soil formation appear?

Are there mudcracks present?

Is there evidence of sediment sorting by grain size?

Vegetation Indicators
Where are the significant transitions in vegetation species, density, and age?

Is there vegetation growing on the channel bed?

If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?

Where are the significant transitions in vegetation?

Is the vegetation tolerant of flowing water?

Has any vegetation been flattened by flowing water?

Ancillary indicators
Is there organic litter present?

Is there any leaf litter disturbed or washed away?

Is there large wood deposition?

Is there evidence of water staining?

Are the following features of fluvial transport present?
Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 3b **Weight each line of evidence and weigh body of evidence**

Weight each indicator by considering its importance based upon:

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
2. Droughts may cause field evidence of OHWM to be obscured, because there has been an extended time since the last high flow event. There can be overgrowth of vegetation or deposition of material from surrounding landscape that can obscure indicators.
3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
2. Does the indicator occur at the same elevation as other indicators?

c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

1. This can be difficult to determine for some indicators and may be specific to climatic region (in terms of persistence of vegetation) and history of land use or other natural disturbances.
2. Chapter 2, Chapter 6, and Chapter 7 of the OHWM field manual describes each indicator in detail and provides examples of areas where indicators are difficult to interpret.

d. Weigh body of evidence:

i. Combine weights: integrate the weighted line of evidence (relevance, strength, reliability) of each indicator.

ii. For each of the observed indicators, which are more heavily weighted? Where do high value indicators co-occur along the stream reach? Do they co-occur at a similar elevation along the banks relative to water surface (or channel bed if there is no water).

iii. On datasheet, select the indicators used to identify the OHWM. Information in Chapter 2 of the OHWM field manual provides descriptions of specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.

e. Take photographs of indicators and attach a log using either page 2 of datasheet or another method of logging photos.

i. Annotate photos with descriptions of indicators.

Step 4 **Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?**

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

b. Any data collected from online tools have strengths and weaknesses. Make sure these are clear when determining relevance, strength, and reliability of the remotely collected data. Clearly describe why other resources were needed to support the lines of evidence observed in the field, as well as the relevance, strength, and reliability of the supporting data and/or resources.

c. Attach any remote data and data analysis to the datasheet.

Step 5 **Describe rationale for location of OHWM:**

a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilities for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

U.S. Army Corps of Engineers (USACE)

INTERIM DRAFT RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-COR.

Form Approved -
OMB No. 0710-0024
Expires: 2024-04-30

The Agency Disclosure Notice (ADN)

The Public reporting burden for this collection of information, 0710-0024, is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

Project ID #: MOX 115 kV Rebuild	Site Name: OHWM-8	Date and Time: 1/12/24
Location (lat/long): 37.826902, -122.203109	Investigator(s): Kevin Fisher, Pim Laulikitnont-Lee	

Step 1 Site overview from remote and online resources

Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [x] geologic maps
- [x] climatic data
- [x] satellite imagery
- [x] land use maps
- [x] aerial photos
- [x] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources. Were there any recent extreme events (floods or drought)?

Constructed ephemeral drainage near native plant garden along trail. No flow present during survey.

Step 2 Site conditions during field assessment. First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

Appears to be a constructed drainage with defined bed and bank near managed native plant garden along public trail.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.

Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:** x
  - [x] *on the bank:* x
  - [ ] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: _____
- [ ] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [ ] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., pools, riffles, steps, etc.):*
- [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)* b
- [ ] **Secondary channels:**

Sediment indicators

- [x] **Soil development:** a
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [x] **Changes in particle-sized distribution:** x
  - [x] *transition from* gravel to soil
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:** a

  Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

  - [x] *vegetation absent to:* forbs
  - [ ] *moss to:*
  - [ ] *forbs to:*
  - [ ] *graminoids to:*
  - [ ] *woody shrubs to:*
  - [ ] *deciduous trees to:*
  - [ ] *coniferous trees to:*
- [x] **Vegetation matted down and/or bent:** x
- [ ] **Exposed roots below intact soil layer:**

Ancillary indicators

- [ ] **Wracking/presence of organic litter:**
- [ ] **Presence of large wood:**
- [x] **Leaf litter disturbed or washed away:** b
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators? Describe:

Project ID #: MOX 115 kV Rebuild

Step 4 Is additional information needed to support this determination? ☐ Yes ☒ No If yes, describe and attach information to datasheet:

Step 5 Describe rationale for location of OHWM

Drainage has defined bed and bank as well as change in vegetation cover and types. Drainage visible on aerial imagery,

Additional observations or notes

Top of bank is 3ft and OHWM is 2ft.

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☒ Yes ☐ No If no, explain why not: _____

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
	Please see Appendix B.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 Site overview from remote and online resources **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 Site conditions during the field assessment (assemble evidence)

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a List evidence

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators
Where are the breaks in slope?
Are there identifiable banks?
Is there an easily identifiable top of bank?
Are the banks actively eroding?
Are the banks undercut?
Are the banks armored?
Is the channel confined by the surrounding hillslopes?
Are there natural or man-made berms and levees?
Are there fluvial terraces?
Are there channel bars?

Sediment and soil indicators
Where does evidence of soil formation appear?

Are there mudcracks present?

Is there evidence of sediment sorting by grain size?

Vegetation Indicators
Where are the significant transitions in vegetation species, density, and age?

Is there vegetation growing on the channel bed?

If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?

Where are the significant transitions in vegetation?

Is the vegetation tolerant of flowing water?

Has any vegetation been flattened by flowing water?

Ancillary indicators
Is there organic litter present?

Is there any leaf litter disturbed or washed away?

Is there large wood deposition?

Is there evidence of water staining?

Are the following features of fluvial transport present?
Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 3b **Weight each line of evidence and weigh body of evidence**

Weight each indicator by considering its importance based upon:

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
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3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
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c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

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Step 4 **Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?**

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

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c. Attach any remote data and data analysis to the datasheet.

Step 5 **Describe rationale for location of OHWM:**

a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilities for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

Appendix C
Representative Site Photographs

Photo 1. Area on the east side of Moraga Substation where the National Hydrography Dataset (NHD) and National Wetlands Inventory (NWI) show a riverine feature; no aquatic resources were observed in this area. Photo taken facing northeast on December 12, 2023.

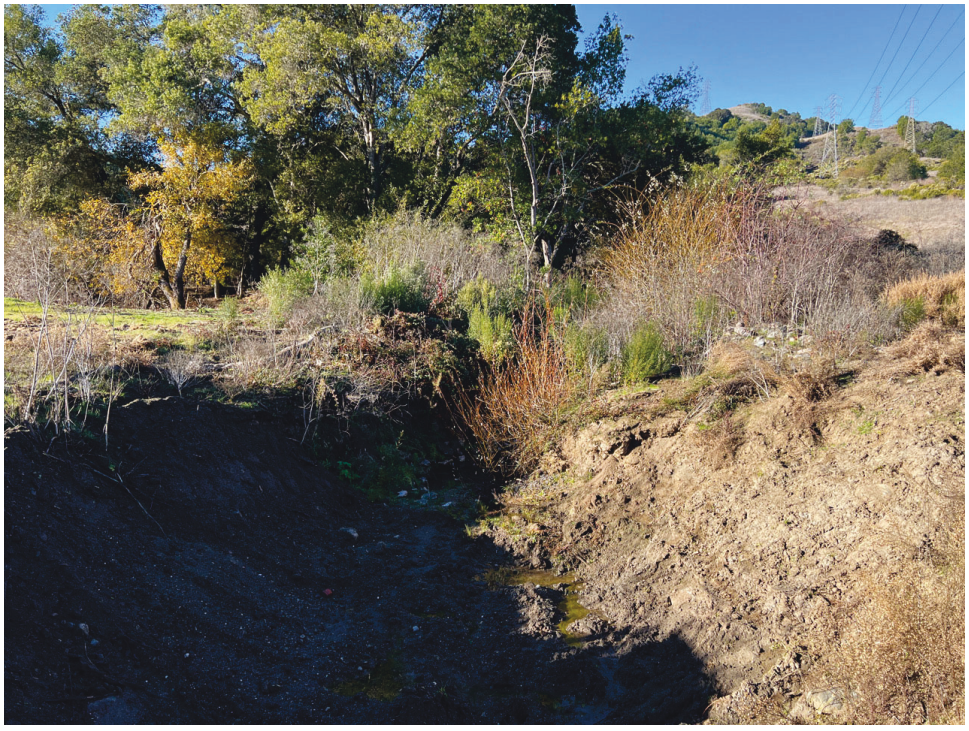

Photo 2. Ordinary high water mark (OHWM)-1 data point at feature R-2 southeast of Moraga Substation. Photo taken facing west/upstream on December 12, 2023.

Photo 3. R-3 along the boundary of the Study Area northwest of Moraga Substation, facing west on December 12, 2023.

Photo 4. Sample point (SP)-1 located in a swale with hydrophytic vegetation. The sample point lacked wetland hydrology and hydric soils; therefore, no wetlands were delineated. Photo taken facing south on December 12, 2023.

Photo 5. SP-2 located in a swale with hydrophytic vegetation. The sample point lacked wetland hydrology and hydric soils; therefore, no wetlands were delineated. Photo taken facing northwest on December 12, 2023.

Photo 6. OHWM-2 data point taken at R-4 along access route southeast of Edgewood Road. Photo taken facing east on December 12, 2023.

Photo 7. OHWM-4 data point taken at R-6 along access route southeast of the proposed staging area on Wilder Road. Photo taken facing east/downstream on December 29, 2023.

Photo 8. Wetland W-01a along access route on Edgewood Road. Photo taken facing northeast on December 12, 2023.

Photo 9. Wetland W-02 northeast of the proposed staging area southeast of the proposed overhead structures RN8 and RS8. Photo taken facing southwest on December 28, 2023.

Photo 10. SP-4a taken at wetland W-03 southwest of the proposed staging area southeast of the proposed overhead structures RN8 and RS8. Photo taken facing northeast on December 28, 2023.

Photo 11. Alder Creek along access route within EBRPD Wilcox Staging Station Staging Area. Photo taken facing northeast on December 28, 2023.

Photo 12. OHWM-3 data point at Alder Creek (R-8) along access route at EBRPD Wilcox Station Staging Area. Photo taken facing south on December 28, 2023.

Photo 13. OHWM-6 data point taken at R-10 west of the proposed overhead structures RN12 and RS12. Photo taken facing north/upstream on January 12, 2024.

Photo 14. OHWM-8 data point taken at R-11 adjacent to a managed native plant garden along access route on Montclair Railroad Trail. Photo taken facing northwest on January 12, 2023.

Photo 15. R-11 ends and sheetflows along trail on access route on Montclair Railroad Trai. Photo taken facing southwest on January 12, 2024.

Photo 16. OHWM-7 data point taken at Shephard Creek (R-12) east of proposed staging area at Shepherd Canyon Park. Photo taken facing north on January 12, 2024.

Photo 17. R-13 north of the tension pull site north of Mountain Boulevard. Photo taken facing west on January 12, 2024.

Photo 18. OHWM-5 data point taken at Palo Seco Creek section of R-14 east of the staging area at Montclair Golf Course. Photo taken facing west and downstream on December 29, 2023.

Photo 19. R-14 at the confluence of Shephard Creek and Palo Seco Creek northeast of the staging area at Montclair Golf Course. Photo taken facing southwest on December 29, 2023.

Photo 20. Concrete-lined ditch connecting to steep ephemeral waters (R-15) northeast of the proposed overhead structures RN24 and RS24. Photo taken facing east on December 29, 2023.