An Analysis of the Geographic Extent of Waters of the U.S., Including Wetlands at the Chevron Tank Farm Facility, San Luis Obispo, California

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DISCLAIMER

Padre Associates and WSP Environment & Energy (hereafter, "WSP/Padre") have prepared this waters/wetlands delineation report for use by Chevron EMC. The results and conclusions of this report are conditional upon final approval by the U.S. Army Corps of Engineers, the California Department of Fish and Game, United States Fish and Wildlife Service, and the Central Coast Regional Water Quality Control Board. Results and conclusions presented in this report are based upon information available in the public domain (*e.g.* U.S. Geological Survey 7.5' topographic quadrangle maps, the Natural Resources Conservation Service Soil Surveys, and air photographs from various sources), and on the WSP/Padre technical team's on-site reconnaissance, data collection, and analyses by standard methods. Results and conclusions presented herein represent the best professional judgment of Padre Associates and WSP Environment & Energy technical staff. In this context, surveying/boundary locations developed by Padre Associates are assumed to be true and correct.

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Table of Contents

EXECUTIVE SUMMARY 1

I. INTRODUCTION & BACKGROUND 3

II. OBJECTIVES 4

III. OVERVIEW OF SITE CHARACTERISTICS 5

A. Current and Historic Land Uses 5
B. Geomorphology and Landscape Context 5
C. Climate and Growing Season 6
1. Climate 6
2. Growing Season 6

IV. METHODS 7

A. Rationale for the determination of the geographic extent of waters of the U.S., including wetlands 7
B. Consistency with SWANCC & "Rapanos" Guidance 7
C. Office Methods & Review of Background Materials 8
D. Field Delineation Methods 8
1. Delineation Team Members 8
2. Field Review and Verification of Other Delineations, Sample Plot Locations, and Data Documenting Site Conditions 8
3. Hydrology 9
4. Soils 9
5. Vegetation 10

V. RESULTS 11

A. Geographic Extent of Waters of the U.S., Including Wetlands 11
1. Summaries of Previous Consultants' Reports 11
2. The WSP/Padre Delineation 13
B. Hydrology 14
1. Landscape-Scale Mapping 14
2. Site Specific Mapping and Hydrologic Processes 14
C. Soils 17
1. Natural Resources Conservation Service Mapping & Other Studies 17
2. WSP/Padre Observations 17
D. Vegetation 18
1. General Description of SLO Tank Farm Vegetation 18
2. Wetland Classes 20

VI. REGULATORY CONTEXTS 22

A. Federal Jurisdiction 22
1. Clean Water Act (CWA), Section 404 22
2. Clean Water Act, Section 401 22
3. Clean Water Act, Section 402 22

4. Endangered Species Act, Section 7 (U.S. Fish and Wildlife Service)..... 23
5. National Historic Preservation Act (NHPA), Section 106..... 23
B. California State..... 23
1. Clean Water Act (Water Quality Certification), Section 401..... 24
2. Porter-Cologne Water Quality Act..... 24
3. Clean Water Act, Section 402..... 24
4. Stream Bed Alteration – Section 1600 Series Permit..... 24
5. California Environmental Quality Act (CEQA)..... 25
6. National Historic Preservation Act, Section 106..... 25
7. Regional Water Quality Control Board (RWQCB) (CWA 401)..... 25
8. California Coastal Commission (CCC)..... 25
C. Local Jurisdiction - San Luis Obispo County..... 25

VII. LITERATURE CITED..... 26

List of Tables

Table 1. Delineations of Waters of the U.S., Including Wetlands Conducted at the Chevron Tank Farm, San Luis Obispo, California

Table 2. Waters/Wetland Areas Removed, Adjusted, or Added Based on 2007-2008 Field Observations by WSP/Padre Technical Team, Chevron Tank Farm, San Luis Obispo, California

Table 3. Criteria for Hydric Soils of the United States

Table 4. U.S. Fish & Wildlife Service Plant Indicator Status (Reed 1988)

Table 5. Summary of the Distribution of Waters of the U.S., Including Wetlands and Other Wetlands Features

List of Figures

Figure 1. Chevron SLO Tank Farm Project Site Location, San Luis Obispo, California

Figure 2. Aerial Image of Chevron SLO Tank Farm Project Site

Figure 3. Waters of the U.S., Including Wetlands, Mapped by Winfield (2001)

Figure 4. Distribution of Protected Plant and Animal Species within Waters of the US, Including Wetlands

Figure 5. Waters of the U.S., Including Wetlands

Figure 6. HGM Wetland Classes

Figure 7. The Central Coast Hydrologic Region and San Luis Obispo Hydrologic Subunit

Figure 8. Storm Water Catchment Areas (Source: Avocet Environmental, Inc. 2008)

Figure 9. Water Flow Directions among Waters/Wetlands

Figure 10. Mapped Soils for the SLO Tank Farm Project Site

List of Photographs

Photograph 1. SLO Tank Farm project site is primarily open space. This photo looks southwest across wetland feature #83 (Reservoir 3) toward a line of trees along the East Fork of San Luis Obispo Creek.

Photograph 2. SLO Tank Farm project site looking eastward along the northern edge of the North Marsh. Cattle graze throughout the majority of the property.

Photograph 3. Much of the SLO Tank Farm project site is dominated by non-native forbs and grasses.

Photograph 4. Oxbow located in the south eastern portion of the site is dominated by scrub/shrub and forested plant communities.

Photograph 5. The East Fork of San Luis Obispo Creek is dominated by scrub-shrub or forest communities along part of the reach within the Chevron SLO Tank Farm project site.

Photograph 6. Depressional wetland (#37) in old tank footprint. Non-native dominants including cocklebur (*Xanthium strumarium*) are in the foreground.

Photograph 7. North Marsh/ Tank Farm Creek slope/ riverine wetland complex at the SLO Tank Farm project site.

Photograph 8. Depressional wetland features such as those in foreground persist as a result of the SLO Tank Farm project site's long history of ranching and industrial development.

Photograph 9. The highest elevations on the SLO Tank Farm project site are in the northeastern portion. The slope grades generally southward and onto valley alluvium.

Photograph 10. Tank Farm Road bisects the SLO Tank Farm project site. Two sets of culverts convey water southward.

Photograph 11. The old crude oil reservoirs were lined with various materials, and berms were installed around their perimeters to contain oil if necessary.

Photograph 12. Berms that show the legacy of soil and hydrologic disturbance are present throughout the SLO Tank Farm project site. Many of these berms are remnants of historic reservoirs.

Photograph 13. Cattle graze across the majority of the SLO Tank Farm project site. Note ponding in foreground.

Photograph 14. East Fork of San Luis Obispo Creek at the SLO Tank Farm. Native California walnuts (*Juglans californica* var. *californica*) are not infrequent along the adjacent riparian corridor.

Photograph 15. East Fork of San Luis Obispo Creek at the SLO Tank Farm. View looking north.

Photograph 16. Old water control structure in Tank Farm Creek, upgradient of the North Marsh.

Photograph 17. Tank Farm Creek in winter 2007 at the SLO Tank Farm project site.

Photograph 18. North Marsh at SLO Tank Farm project site (April 2008). Note dominance by native rushes (*Juncus* spp.) and bulrush (*Schoenoplectus* spp.).

Photograph 19. Twin concrete culverts under Tank Farm Road.

Photograph 20. Headworks at south end of wetland #98 infrequently connect the southern extent of the SLO Tank Farm site with the East Fork of San Luis Obispo Creek.

Photograph 21. Ponding was observed in Reservoir 6 (Wetland #45) in January 2008.

List of Appendices

Appendix A – Correspondence between EDAW and NRCS (1999)

Appendix B – Arid West Manual datasheets

Appendix C – Resumes of Principal Scientists

Appendix D – Location and Areal Extent of Waters/Wetlands Under Federal Jurisdiction

EXECUTIVE SUMMARY

In July of 2007, WSP Environment & Energy (WSP) was requested by Chevron Environmental Management Company (CEMC) to assist Padre Associates, Inc. (Padre) with identification and delineation of the current geographic extent of waters of the U.S., including wetlands under Clean Water Act (CWA) jurisdiction (hereafter "waters/wetlands") on the San Luis Obispo Tank Farm (hereafter "SLO Tank Farm") project site. Union Oil Company owns the 340-acre tank farm property. It is located immediately south of the city of San Luis Obispo, in San Luis Obispo County, California. SLO Tank Farm abuts East Fork of San Luis Obispo Creek, which is a tributary to the Pacific Ocean; it lies outside the designated "Coastal Zone" in San Luis Obispo County.

This report has been developed by the WSP/Padre team using (1) current U.S. Army Corps of Engineers (hereafter "US ACOE") and U.S. Environmental Protection Agency (hereafter "EPA") guidance concerning jurisdictional delineations, and a (2) combination of 2007-2008 field-based observations of site conditions at the SLO Tank Farm and consideration of several previous waters/wetlands identification and delineation studies at the SLO Tank Farm site. These earlier studies were completed by other consultants to either Unocal or Chevron EMC during the interval 1999 to 2003. Information offered in this report is arranged to (1) describe the delineation objectives, (2) introduce and describe briefly the contexts and results of prior delineations on the SLO Tank Farm property, (3) explain the approach and methodology used by the WSP/Padre team in this delineation, (4) provide technical results, and (5) discuss pertinent regulatory contexts and issues at the federal, state, and local levels of jurisdiction.

The three main objectives for this effort are as follows:

1. Delineate the geographic extent of waters/wetlands within the San Luis Obispo Chevron Tank Farm project area consistent with definitions provided in CFR 33 328.3 (a)(1-8), 328.3 (b, c, and e) (Federal Register 1986), and procedures detailed in the *1987 Manual* (Environmental Laboratory 1987) and in the *Arid West Regional Supplement* (US ACOE 2006) as implemented with pertinent regulatory guidance letters, memoranda, and public notices.

2. Summarize the regulatory context of waters/wetlands within the project area, paying particular attention to current federal, state of California, and San Luis Obispo County regulations and policies.

3. Work with the US ACOE and California State and San Luis Obispo County regulatory agencies to review and certify the delineation.

The WSP/Padre field team delineated one hundred three (103) polygons on the SLO Tank Farm project site. WSP/Padre determined the classification of waters/wetlands on the project site consistent with the hydrogeomorphic types described by Brinson (1993) and Brinson *et al.* (1995).

Delineation results were reviewed and given preliminary approval in the field on June 9, 2008 by Mr. Bruce Henderson, Los Angeles District, US ACOE. As always, the results and

recommendations offered in this report are subject to final review and approval by the US ACOE. At the June 2008 field review, Mr. Henderson determined that of the 103 waters/wetlands polygons mapped by the WSP/Padre team, 38 are wetlands *per se* and under federal CWA jurisdiction. Their combined area is 49.0 acres. Another six polygons are otherwise called "'other waters' of the U.S." Their combined total area is 3.9 acres. Therefore, total area of waters/wetlands under federal CWA jurisdiction at the SLO Tank Farm project site is 52.9 acres.

Forty-four (44) polygons mapped on the SLO Tank Farm project site are not under federal CWA jurisdiction because they are isolated depressional features that either have (1) no connection with, or adjacency to, traditionally navigable waters, and/or (2) no significant nexus with interstate commerce or maintenance of the physical, biological, or chemical integrity of downstream waters. However, these wetland features support special status species that are protected at federal and/or state levels of jurisdiction. Total area of waters/wetlands not under federal CWA jurisdiction, but which do support special status species is 15.8 acres. Finally, fifteen (15) wet depressional features mapped on the SLO Tank Farm site do not support any special status species. Their combined total area is 3.4 acres.

I. INTRODUCTION & BACKGROUND

In July of 2007, WSP Environment & Energy (WSP) was asked by Chevron Environmental Management Company (CEMC) to assist Padre Associates, Inc. (Padre) with identification and delineation of the current geographic extent of waters of the U.S., including wetlands, under Clean Water Act (CWA) jurisdiction (hereafter "waters/wetlands") on the San Luis Obispo Tank Farm (hereafter "SLO Tank Farm") project site. Union Oil Company owns the 340-acre tank farm property. It is located immediately south of the city of San Luis Obispo, in San Luis Obispo County, California (Figures 1 and 2). The SLO Tank Farm abuts East Fork of San Luis Obispo Creek, which is an infrequently intermittent to perennial tributary to the "traditionally navigable waters" of the Pacific Ocean. SLO Tank Farm is not within the designated "Coastal Zone" in San Luis Obispo County as designated by the California Public Resources Code Division 20, §§30000 – 30012.

In this report, the WSP/Padre technical team provides results of their delineation effort. These results were reviewed and given preliminary approval in the field on June 9, 2008 by Mr. Bruce Henderson of the Los Angeles District of the U.S. Army Corps of Engineers (hereafter "US ACOE"). As always, the results and recommendations offered in this report are subject to final review and approval by the US ACOE.

This report has been developed by the WSP/Padre team using (a) current US ACOE and U.S. Environmental Protection Agency (hereafter "EPA") guidance concerning jurisdictional delineations, and (b) a combination of 2007-2008 field-based observations of site conditions at the SLO Tank Farm and consideration of several previous waters/wetlands identification and delineation studies at the SLO Tank Farm site. These studies were completed by other consultants to either Union Oil or CEMC during the interval 1999 to 2003. The information offered in this report is arranged to: (1) describe the delineation objectives, (2) introduce and briefly describe the contexts and results of prior delineations on the Chevron Property, (3) explain the approach and methodology used by the WSP/Padre team in this delineation, (4) provide technical results, and (5) discuss the pertinent regulatory contexts and issues at the federal, state, and local levels of jurisdiction.

II. OBJECTIVES

The three main objectives for this effort are as follows:

1. Delineate the geographic extent of waters/wetlands within the SLO Tank Farm project area consistent with definitions provided in CFR 33 328.3 (a)(1-8), 328.3 (b, c, and e), and procedures detailed in the *1987 Manual* (Environmental Laboratory 1987) and in the *Arid West Regional Supplement* (US ACOE 2006) as implemented with pertinent regulatory guidance letters, memoranda, and public notices.
2. Summarize the regulatory context of waters/wetlands within the project area, paying particular attention to current federal, state of California, and San Luis Obispo County regulations and policies.
3. Work with the US ACOE and California State and San Luis Obispo County regulatory agencies to review and certify the delineation.

III. OVERVIEW OF SITE CHARACTERISTICS

A. Current and Historic Land Uses

The SLO Tank Farm is owned by the Union Oil Company. Storage facilities and supporting infrastructure were constructed in 1910 to serve as the tidewater accumulation point for the petroleum pipeline from the San Joaquin Valley. The tank farm facility was withdrawn slowly from Union Oil operations during the later decades of the twentieth century, and by the late 1990s, it was formally decommissioned (Avocet Environmental 2007).

With the exception of a small area of office buildings that serves as the local headquarters for CEMC west coast, the SLO Tank Farm site primarily is open space (Figure 2, Photographs 1 and 2). For the past several decades, tank farm lands have been leased for cattle grazing for the purposes of fire and weed control. Adjacent land uses include the San Luis Obispo County Airport to the south, and light commercial and industrial developments, agricultural and pastoral land with scattered residences, and a trailer park to the east.

At the SLO Tank Farm, topography, soils, and vegetation have been altered considerably through plowing and disking, catastrophic fire, grazing of domestic livestock, construction and removal of oil storage tanks and their surrounding berms, stream channelization, construction of water and oil management and containment systems, and several other anthropogenic alterations. Currently, most of the SLO Tank Farm is dominated by non-native species of forbs and grasses (Photograph 3). However, some scrub/shrub and forested plant communities occur in wet depressions or within riparian corridors associated with East Fork of San Luis Obispo Creek and its tributaries (Photographs 4 and 5). Waters of the U.S., including wetlands, in the forms of riverine, depressional, and small slope ecosystems are prominent throughout the SLO Tank Farm (Photographs 5, 6, 7 and 8). Many of the waters/wetlands on the property are associated with natural features such as swales, small riverine channel systems, or depressions. However, some of the depressional and slope wetlands are associated with human-made depressions that remain after decommissioning of oil storage facilities (Photographs 1 and 6) or after various mining or domestic livestock management operations (Photograph 8).

B. Geomorphology and Landscape Context

The SLO Tank Farm is located in a geologically complex and seismically active region. The underlying geologic structure has been formed during millions of years of folding and faulting as the Pacific plate moves north along the North American plate. Geologic structure in this landscape is oriented primarily in a northwesterly direction with the coast range.

From the perspective of surficial processes and landforms, the SLO Tank Farm is located in a coastal basin that is partially filled with late Pleistocene and early Holocene alluvium (Figures 1 and 2). The northern portion of the site is characterized by a slope/riverine wetland complex that serves as the headwaters of a small, unnamed tributary (locally known as “Tank Farm Creek”) of East Fork of San Luis Obispo Creek. This tributary has been mostly disconnected from East Fork of San Luis Obispo Creek due to historic road construction, water and oil management

operations, and other anthropogenic activities. Underlying geology of the north half of the SLO Tank Farm site includes a colluvial toe slope near the northern property boundary that grades generally south and onto valley alluvium (Photograph 9). Alluvial soils dominate the central and southern portions of the site. The valley alluvial surfaces are approximately 8,000 -10,000 years old while the colluvial toe slope on the northern property boundary is a somewhat older surface. The extreme southern potion of the SLO tank Farm site, generally on the southern property boundary, has been shaped by the East Fork of San Luis Obispo Creek channel system as it has alternatively incised and migrated back and forth across the basin floor (Figure 2).

C. Climate and Growing Season

1. Climate

The San Luis Obispo area has a mild, Mediterranean climate with warm, dry summers and wetter, cooler winters. The average maximum temperature (by month) ranges from 63 °F in January to 79.5 °F in September. Average minimum temperatures range between 41.6 °F in Jan and 53 °F in August (Station No. 047851-4) (WRCC 2007). In this coastal area, the majority of precipitation comes as rainfall during the winter months (Nov–April). Average annual precipitation is 23.45 inches (WRCC 2007).

2. Growing Season

For the purposes of delineations of waters/wetlands, the US ACOE, EPA and Natural Resources Conservation Service (NRCS) currently define “growing season” as that part of the year when soil temperatures at 19.7 inches below the soil surface are higher than “biological zero” (41 °F or 5 °C) (USDA Soil Conservation Service [NRCS] 2006). When soil temperature data are not available, current national guidance for the delineation of waters/wetlands is to use the closest and best available weather station data to estimate the length of the growing season (US ACOE 1992). For example, current national guidance allows for use of the 28 °F standard from either WETS (Climate Analysis for Wetlands) data (NRCS 2002) or data from pertinent NRCS Soil Surveys to approximate the duration of frost-free intervals for a particular location (US ACOE 1992). In this report, recent data recorded at WETS station CA7851, in the city of San Luis Obispo (NRCS 2002), were used to determine the growing season. Using the NRCS guidance, this data indicates that the growing season technically extends throughout the winter wet season (365 days) in the San Luis Obispo region. For the purpose of determining the hydrology parameter for delineation (COE 1992), five percent (5%) of the growing season (365 days) results in a requirement for saturation to the surface for at least 18.3 days.

IV. METHODS

A. Rationale for the determination of the geographic extent of waters of the U.S., including wetlands

Based upon guidance provided in the *1987 Manual* (Environmental Laboratory 1987), the *Arid West Supplement* (Environmental Laboratory 2006), and in Regulatory Guidance Letters 82-2, 86-9, and 90-7, wetlands disturbed through natural and/or anthropogenic alterations of hydrology, soils, and/or vegetation do not necessarily exist under "normal circumstances." As introduced in the preceding text, hydrologic, soil, and plant community conditions at the SLO Tank Farm have and continue to be disturbed by a suite of historic and/or current crude oil storage, agricultural, and development-related activities. Disturbances to hydrology include ditching, grading, cultivation, redirection and/or consolidation of storm water to and through the site, oil spill containment features, and installation of numerous drainage and pipe systems (Photographs 1, 6, and 10). Disturbances to soils include deposition of imported fill materials, berm construction, ripping, plowing, discing, road construction, and compaction by domestic livestock (Photographs 10 through 13). Disturbances to native vegetation include domestic livestock grazing, conversion of native and non-native plant communities to pasture, clearing, discing, burning, *etc*. (Photographs 2 and 13). Due to the combination of site disturbances and their effects on current hydrologic, soil, and vegetation conditions on the SLO Tank Farm, the WSP/Padre technical team chose to delineate waters/wetlands using a combination of "Routine" and "Atypical" approaches as articulated in the *1987 Manual* (Environmental Laboratory 1987).

B. Consistency with SWANCC & "Rapanos" Guidance

Recent decisions in the U.S. Supreme Court (*i.e.*, Solid Waste Agency of Northern Cook County [SWANCC] v. US ACOE (531 U.S. 159, 2001) January 9, 2001; Rapanos *et ux., et al.* v. United States, June 19, 2006) have led to the development of federal guidance that requires a careful examination and documentation of the physical location(s) and hydrologic connections among waters/wetlands. To determine federal jurisdiction, particular focus is given to (1) surface hydrologic connections between a wetland and "navigable waters in fact," (2) "adjacency" of a wetland to traditionally navigable waters, and thus (3) a "significant nexus" to interstate commerce. In addition, waters/wetlands features can be determined to be under federal jurisdiction by the US ACOE or EPA if a "significant nexus" can be shown between the wetland feature in question and its contribution to the maintenance or restoration of the physical, chemical, or biological integrity of downstream waters that are traditionally navigable.

Federal guidance for field delineation procedures that address the Rapanos decision has been offered by the EPA and the US ACOE in a joint memorandum issued June 5, 2007 (EPA and US ACOE 2007). To the extent possible, the WSP/Padre team adhered to extant SWANCC and Rapanos guidance in offering suggestions for determination of federal jurisdiction in waters/wetlands at the SLO Tank Farm.

To begin, we recognized that the East Fork of San Luis Obispo Creek from the SLO Tank Farm reach and then downstream is infrequently intermittent or perennial. Thus, it is regularly

connected via surface flows to the traditionally navigable waters of the Pacific Ocean. Having established the connection of San Luis Obispo Creek system to the Pacific Ocean, we recognized relatively natural riverine, slope or depressional waters/wetlands features that were either within or "adjacent" to (*i.e.*, bordering, neighboring, or contiguous) East Fork of San Luis Obispo Creek and its main tributaries (*e.g.*, Tank Farm Creek) as likely to be jurisdictional under current federal guidance. Non-adjacent isolated depressions or slopes, whether they were relatively natural or human-made features generally were not recommended by the WSP/Padre team as being under federal jurisdiction.

C. Office Methods & Review of Background Materials

Prior to our field delineation, the WSP/Padre team reviewed available public domain information including current and historic aerial photographs, the San Luis Obispo County Soil Survey (NRCS 2008), U.S. Geological Survey maps, weather data, *etc*. We also reviewed site documentation provided by EMC Staff and their consultants. These documents included a chronology of land uses and events on the site (Avocet Environmental 2007) and previous delineation maps and/or reports (EDAW 1999, BBL 1999, Jenesis 2003, and Rincon 2003). Table 1 compares methodologies and results from the previous reports.

D. Field Delineation Methods

1. Delineation Team Members

The WSP/Padre delineation team consisted of Ms. Jessica Peak and Mr. Brian Dugas of Padre Associates, and Drs. Lyndon C. Lee and Peggy L. Fiedler of WSP. Both Lee and Fiedler are Professional Wetland Scientists certified by the Society of Wetland Scientists. Both Lee and Fiedler have over 20 years experience delineating waters/wetlands throughout the California Central coast. Resumes are included in Appendix C.

2. Field Review and Verification of Other Delineations, Sample Plot Locations, and Data Documenting Site Conditions

During past delineation efforts on the Tank Farm property (Table 1), different types of vegetation, soils, and hydrology data have been collected to characterize and document site conditions. In developing this report, we reviewed each delineation map in the field to assess the accuracy of wetland identifications and delineated wetland boundaries. When necessary, we adjusted wetland boundaries to reflect current conditions in the field, current federal guidance, *etc*. Table 2 provides a summary of waters/wetland areas removed, adjusted, or added based on our 2007-2008 field observations. While we reviewed all previous reports and supporting data from other consultant teams (*e.g.* EDAW 1999, BBL 1999, Jenesis 2003, and Rincon 2003), for the sake of brevity we did not duplicate these data (field sheets, charts, graphs, *etc*.) or incorporate them into this report. Instead, in this document we provide a general summary of the delineation approach taken by the various consultants (Table 1), and with this explanation, we incorporate their supporting data by reference.

WSP/Padre technical team data sheets for wetlands identified for the first time in this report are included in Appendix B. Consistent with current US ACOE guidance, the Appendix B data sheets are tabulated on the *Arid West Supplement* forms (Environmental Laboratory 2006).

3. Hydrology

The WSP/Padre field team spent the late fall of 2007, and the winter/early spring wet season of 2007 – 2008 observing patterns of ponding and saturation of soils on the SLO Tank Farm site. Consistent with the *1987 Manual* "Atypical Situation" protocols, the *Arid West Regional Supplement* (Environmental Laboratory 2006), and current regulatory guidance (*i.e.*, US ACOE 1992), wetland hydrology can be determined by evaluating a variety of direct and indirect indicators. Direct indicators, include gage or well data, flood predictions (*i.e.*, FEMA maps), and historic records pertaining to the study area. Indirect field indicators include, but are not limited to visual observation of inundation and/or saturation, sediment deposition, drainage patterns in wetlands, hydric soil characteristics, watermarks, drift lines, oxidized channels (*i.e.*, rhizospheres) associated with living roots and rhizomes, and water stained leaves (Environmental Laboratory 1987).

Wetland hydrology is considered to be present at a location if field observations indicate the area has a high probability of being periodically inundated or saturated to the soil surface for a sufficient duration of the growing season to develop anaerobic conditions in the surface soil environment (*i.e.*, root zone) (Environmental Laboratory 1987). According to guidance in the *Arid West Regional Supplement* (Environmental Laboratory 2006), if at least one primary indicator or at least two secondary indicators are present at a sample point, the wetland hydrology criterion is met.

Due to the degrees and types of disturbances on the SLO Tank Farm property, we examined several types of evidence that would allow us to determine whether wetland hydrology previously existed or currently exists. The delineation team considered the type and frequency of site alterations that occurred, the effects of alterations on site hydrology, and, to the extent possible, hydrologic conditions that previously existed.

4. Soils

The WSP/Padre team determined the presence of hydric soils consistent with criteria articulated in the *1987 Manual* (Environmental Laboratory 1987), current regulatory guidance, *Field Indicators of Hydric Soils in the United States, Version 6.0, Hydric Soils of the United States* (USDA, NRCS 2006), and information provided in the *Arid West Regional Supplement* (Environmental Laboratory 2006).

Hydric soils are defined as soils "that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (Federal Register July 13, 1994). Determination of whether or not a soil is hydric is based on the fulfillment of at least one of four technical criteria (Federal Register September 18, 2002; Table 3).

The technical criteria can be satisfied using a combination of published soils information and field indicators. Field indicators for determining whether a soil satisfies the hydric soil definition and the technical criteria for hydric soils are listed in the *Field Indicators of Hydric Soils in the United States* (USDA NRCS 2006). Field indicators published in the above-referenced document supersede guidance provided in the *1987 Manual* (Environmental Laboratory 1987).

On the SLO Tank Farm property, the WSP/Padre team used direct field observations in combination with the San Luis Obispo County Soil Survey (NRCS 1979, 2004, 2008) and San Luis Obispo County Hydric Soils list (NRCS 2008). Specifically, we examined soils and historical air and site photographs for evidence that hydric conditions currently exist or previously existed. In particular, we considered the type and timing of alteration(s) (*e.g.,* fires, grazing, plowing, disking, ditching), historic and extant effects of alteration(s) on soil conditions, and locations and types of soils that previously occurred on the site.

5. Vegetation

Presence of hydrophytic vegetation was determined using criteria and procedures outlined in the *1987 Manual* (Environmental Laboratory 1987). Dominant species in each of four strata (tree, sapling/shrub, herb, and woody vine) were identified. Species identifications and taxonomic nomenclature follow *The Jepson Manual* (Hickman 1993) with the exception of the Cyperaceae, which follows the *Flora of North America*, Volume 23 (FNA 2002). Each species' indicator status was assigned using the *National List of Plant Species that Occur in Wetlands: California (Region 0)* (Reed 1988) (hereafter "*The National List*"). A species indicator status refers to the relative frequency with which the species occurs in jurisdictional wetlands (Table 4).

The *Arid West Regional Supplement* (Environmental Laboratory 2006) recommends that presence of dominant species is determined using the 50/20 rule. Dominant species are those species that individually or collectively cover more than 50% of the total vegetative cover within each stratum, in addition to those species that by themselves cover 20% or more of the total cover within each vegetation stratum. According to both the *1987 Manual* and the *Arid West Regional Supplement*, the hydrophytic vegetation parameter for wetlands is met when, under normal circumstances, more than 50% of the dominant species from each stratum are obligate wetland (OBL), facultative wetland (FACW), and/or facultative (FAC) species. The *1987 Manual* (but not the *Arid West Regional Supplement*) calls, in certain circumstances, for a plus (+) or a minus (-) sign to be included for the purpose of designating a higher or lower level of the indicator status. A FAC- indicator status is generally not considered to be an indicator of hydrophytic vegetation (*i.e.*, it is treated in the same way as facultative upland (FACU), upland (UPL), and not listed (NL) status).

On the SLO Tank Farm property, we examined existing vegetation and historical aerial and site photographs for evidence that hydrophytic vegetation conditions currently exist or previously existed. In particular, we considered the type and timing of alteration(s) (*e.g.,* plowing, disking, ditching, mowing, burning [historic and extant]), effects of alteration(s) on vegetation conditions, and locations and types of plant community types that previously occurred on the site.

V. RESULTS

A. Geographic Extent of Waters of the U.S., Including Wetlands

1. Summaries of Previous Consultants' Reports

Table 1 provides a tabular summary of previous waters/wetland delineation work by consultant teams. Below, we offer an expanded summary and synthesis of previous work.

a. EDAW – 1999

In 1999, EDAW was retained by UNOCAL to delineate waters/wetlands on the property then known as the "Unocal Tank Farm." EDAW used as a baseline a previous waters/wetlands delineation that had been conducted in 1994 by the US ACOE, Los Angeles District, for the tank farm south of Tank Farm Road. The delineation effort documented a total of 39.15 acres of jurisdictional waters/wetlands at that time, but the delineation was considered to have expired by June 1999.

EDAW used both routine and comprehensive approach to the delineation of waters/wetlands at the SLO Tank Farm site. Initially, EDAW identified areas of potential jurisdiction on a 1997 1:200 aerial photograph. These areas were identified and further mapped in the field. The field effort was conducted by two EDAW scientists, who collected representative data at 64 sampling points in May, 1999. Sixty-four data sheets are contained in the EDAW (1999) report.

Subsequent to the field effort, the waters/wetlands polygons were digitized using a GIS system to calculate area. EDAW (1999) reported a total of 57.2 acres of jurisdictional waters/wetlands, with 55.8 acres of wetlands and 1.4 acres of "other waters." Wetlands were categorized as freshwater wetlands, season wet meadow, jurisdictional tar flats, and riparian wetlands. EDAW described the 1.4 acres of "other waters" as the tributary to Acacia Creek and several areas in which standing water was observed but in which no hydrophytic vegetation was present.

b. Ted Winfield & Associates – 2001

The map that resulted from Mr. Ted Winfield's adjustments to the EDAW (1999) delineation in 2002 is included in this report as Figure 3. It is important to note the following points:

> (1) Ted Winfield did not conduct his own delineation. Instead, Dr. Winfield used EDAW's original 1999 map as the basis for his field exercise in the identification of what he called "isolated non-jurisdictional wetlands."
>
> (2) From all appearances, and without the ability to confirm, it is probable that the 1999 map developed by EDAW was the one also used later by Blasland, Bouck & Lee (BBL), and all subsequent reviews of waters/wetlands (*e.g.*, Jenesis [2003]).

(3) In 1999, NRCS/US ACOE verified the EDAW delineation. The response letter from Ms. Cheryl Zelus of NRCS to Mr. Gary Jakobs of EDAW is included in Appendix A.

(4) Dr. Winfield's analysis of the extent of US ACOE jurisdiction is no longer supported as a result of the SWANCC decision. Winfield argued that a single berm is sufficient to effect "isolation" in this regulatory context. The key sentence is found on the first major paragraph on page 4 (lines 17-19) of his letter report:

> *In situations where there are multiple barriers [berms] between the wetland and the nearest navigable water or tributary water, these wetlands should be considered isolated.*

(5) The US ACOE (Mr. Bruce Henderson) met with John Ljung of Unocal on September 9, 2002 to review Winfield's new map; however there appears to be no follow-up letter or documentation from the US ACOE pertaining to the results of the 2002 review.

c. Jenesis – 2003

Jenesis used a one-parameter approach (*i.e.*, presence of wetland plants, or wetland soils, or wetland hydrology) to determine whether a "state wetland" was present at each "federal" wetland as delineated by EDAW. In so doing, Jenesis staff appeared to have relied primarily on the presence of wetland vegetation. The report states:

> *The presence of hydrophytic vegetation at an observation point typically was the parameter satisfying the definition of a state wetland, more commonly than the presence of evidence of suitable hydrology* (p. 4, ¶6, lines 29-31).

Delineating wetlands by using a one-parameter approach is the methodology generally accepted by the California Coastal Commission for wetlands protected by the state under the California Coastal Act (CCA) (California Public Resources Code Division 20, §§30000 – 30012). Within the Coastal Zone as defined by the CCA, wetland protection is determined by the Local Coastal Program for the coastal city or county. As discussed at the outset of this report, the waters/wetlands on the SLO Tank Farm are not protected by the California Coastal Act as designated by the LCP for San Luis Obispo County because they are not within the designated local coastal zone.

Therefore, the Jenesis wetlands delineation used an approach that is appropriate only for identification and delineation of "state wetlands" as protected by the CCA, and not by any other California Public Resources Code. Further, as a consequence of an inappropriate extension of the "riparian zone" protected by the 1600 series public code, and the inappropriate use of a CCA wetland delineation methodology, the wetlands protected by the State of California should be re-delineated, and focused on the riverine waters and/or wetlands on the SLO tank farm project site. The result of this exercise would be to decrease significantly the area of "state wetlands" that have been presented and discussed throughout the planning processes for site remediation and development.

d. Blasland, Bouck and Lee (BBL) – 1999/2003

In 2003, staff from BBL apparently obtained (electronic) polygons from the original 1999 EDAW delineation map and overlaid them on a base map with enhanced site topographic information (2 ft. contour intervals). No data sheets, survey information, or reports accompany the BBL effort.

e. Rincon Consultants, Inc. – 2003

In 2003, staff from Rincon Consultants, Inc. mapped the distribution of vernal pool fairy shrimp in wet and dry seasons. Figure 4 is the WSP/Padre team synthesis of the Rincon work. It shows the distribution of vernal pool fairy shrimp (as well as other special status species identified subsequently) in waters/wetlands mapped by the WSP/Padre team.

2. The WSP/Padre Delineation

The WSP/Padre field team delineated one hundred three (103) polygons on the SLO Tank Farm project site (Figure 5 and Table 5). In addition to delineation, Figure 6 and Table 5 offer a classification of waters/wetland consistent with the hydrogeomorphic classes described by Brinson (1993) and Brinson *et al.* (1995). On the SLO Tank Farm site, we observed and mapped riverine, depressional and slope waters/wetlands. Examples of each are given in Photographs 5, 6, and 7, respectively.

As introduced at the outset of this report, Mr. Bruce Henderson of the US ACOE Los Angeles District worked in the field with the WSP/Padre technical team on June 9, 2008. Results of this field review effort are that Mr. Henderson determined that, of the 103 waters/wetlands polygons mapped by the WSP/Padre team, 38 are wetlands *per se* and under federal CWA jurisdiction. Their combined area is 49.0 acres (Table 5). Another six (6) polygons are so-called “other waters” of the U.S. Their combined total area is 3.9 acres (Table 5). Therefore, the total area of waters/wetlands under federal CWA jurisdiction at the SLO Tank Farm site is 52.9 acres.

A total of 44 mapped polygons on the SLO Tank Farm project site are not under federal CWA jurisdiction because they are isolated depressional features that either have no connection with or adjacency to traditionally navigable waters and/or have no significant nexus with interstate commerce, or maintenance of the physical, biological, or chemical integrity of downstream waters (Figure 5 and Table 5). However, in all instances, these wetland features support special status species that are protected at federal and/or state levels of jurisdiction (Figure 4 and Table 5). Total area of the waters/wetlands not under federal CWA jurisdiction but which do support special status species is 15.8 acres (Table 5).

Finally, fifteen (15) wet depressional features mapped on the SLO Tank Farm site do not support any special status species. Their combined total area is 3.4 acres (Figure 5 and Table 5).

B. Hydrology

1. Landscape-Scale Mapping

The California Department of Water Resources (CA DWR) has mapped the SLO Tank Farm site within the 44,370-acre "San Luis Obispo Hydrologic Subunit" of the 11,326 mi^2 Central Coast Hydrologic Region (Figure 7). The CA DWR websites provides extensive information regarding general characteristics of water and water resources for the San Luis Obispo Subunit. For the 2005 Update to the California Water Plan, please refer to www.waterplan.water.ca.gov/previous/cwpu2005/index.cfm (CA DWR 2005 a). For maps of hydrologic units, please refer to http://www.landwateruse.water.ca.gov/studyarea/maps.cfm (CA DWR 2005b).

Similarly, the U.S. Geological Survey has identified the SLO Tank Farm site as existing within the #18060006 Central Coastal Hydrologic Unit. Information pertaining to the 18060006 hydrologic unit can be obtained at [http://cfpub.epa.gov/surf/huc.cfm?huc_code=18060006].

2. Site Specific Mapping and Hydrologic Processes

a. Maps and Photographs

In 2008, Avocet Environmental characterized the SLO Tank Farm project site with respect to the storm water catchment areas that contribute flows to the site or that exist entirely within the site (Figure 8). Also in 2008, the WSP/Padre Technical team (1) arranged for an aerial photograph to be taken of the site during wet conditions (Figure 2), and (2) developed an estimate of the directions of flow for surface waters on the SLO Tank Farm site (Figure 9). The Avocet and WSP/Padre maps are overwhelmingly in agreement, departing only in their estimates/treatment of the frequency of intermittent or ephemeral connections of surface flows from the southern portions of the SLO Tank Farm site to the East Fork of San Luis Obispo Creek.

b. The North Marsh/Tank Farm Creek System

The North Marsh/Tank Farm Creek system occupies the western portions of the SLO Tank Farm property, both north and south of Tank Farm Road (Figures 6, 8, and 9). The North Marsh/Tank Farm Creek system collects precipitation and storm water from a catchment approximately 485 acres in size, including approximately 150 acres on the SLO Tank Farm proper (Figure 8 and 9). Much of the catchment that contributes flow to the North Marsh/Tank Farm Creek system is located north of the northern SLO Tank Farm property boundary. Water currently enters the SLO Tank Farm site as sheet flow or is concentrated into natural channels that flow in a generally westerly direction parallel to the northern property line. Development plans for the area immediately north of the property likely will change the configuration of catchment areas upgradient of the SLO Tank Farm site. Specifically, flows are likely to concentrate toward one or possibly a few locations in the northwest property corner. As of this writing, it appears that the water storage capacity of the "North Marsh/Tank Farm Creek" complex that will be retained on

the SLO Tank Farm site will be more-than-adequate to store and process any reasonable hydrologic changes that may result from up-gradient developments.

Water from the north-central and north-eastern portions of the SLO Tank Farm site flows in a generally southwesterly direction (1) in and through the gently sloping alluvial soils that have aggraded in the North Marsh complex, upstream of the Tank Farm Road thru fill, and (2) in the highly modified and degraded channel system known as Tank Farm Creek (Photographs 16, 17, and 18). Water in this channel system passes under Tank Farm Road via twin corrugated metal pipe (CMP) culverts or twin concrete culverts installed through the Tank Farm Road roadway fills (Photographs 19). At this point in the landscape, it appears that water can flow either way through the twin concrete culverts that pass under Tank Farm Road. In addition, several ditches along the Tank Farm Road right-of-way collect storm water from adjacent frontage properties. A local high point is located approximately 1,000 feet east of South Higuera Street. Storm water collected east of this point drains toward the SLO Tank Farm and eventually discharges into the North Marsh/Tank Farm Creek complex.

After passing under Tank Farm Road, water in the main stem of the North Marsh/Tank Farm Creek system flows generally southeast (Figure 9). At high water and during floods, the Tank Farm Creek channel system overflows its banks and engages several depressional features adjacent to the main channel system (*e.g.*, wetlands #42 and #43, Figure 9). South of Tank Farm Road and immediately north of the extreme southeast corner of the SLO Tank Farm property is a discharge point for surface water flows in the North Marsh/Tank Farm Creek system (Photograph 20). This discharge point and surrounding area is the downstream end of the North Marsh/Tank Farm Creek channel system on the SLO Tank Farm site.

c. Depressions North of Tank Farm Road

In addition to the North Marsh/Tank Farm Creek complex, a series of depressional wetlands is located throughout the northern portion of the SLO Tank Farm project site. These wetland features are either man-made (*e.g.* within old containment berms for oil storage tanks – Wetlands #15, 16, 21, 30, 32, 35, 37, Figure 9) or relatively natural or excavated concave features that pond water for long (*e.g.*, 7-30 days) or very long (*e.g.*, > 30 days) duration (*e.g.*, Wetlands #6, 33, 7, 8, 101, Figure 9). The bottom of these depressions can consist of concrete, urban fill, or relatively native soils that are highly compacted by domestic livestock, machinery, *etc*. These depressions receive water from direct precipitation, or in some instances, from storm flows that emanate from the immediately surrounding small sub-watershed areas.

d. Hydrologic Processes for Areas South of Tank Farm Road

As discussed previously, the SLO Tank Farm is situated adjacent to and north of the East Fork of San Luis Obispo Creek, an infrequently intermittent, mostly perennial tributary to the main stem of San Luis Obispo Creek (Photographs 5 and 15). The main stem of San Luis Obispo Creek is a perennial stream that joins the tidal and traditionally navigable waters of the Pacific Ocean. Although infrequent in occurrence, a large portion of the southern extent of the SLO Tank Farm site (*e.g.*, areas mapped as “Closed Catchment” in Figure 8, including the areas south of the East Fork San Luis Obispo Creek levee system and Catchment Areas B1, B2, B3, and B4 in Figure 8) discharges directly to the East Fork of San Luis Obispo Creek (Figures 8 and 9) via twin culverts

controlled by old gate structures (Photograph 20). However, most of the time the southern portion of the SLO Tank Farm site acts as a closed catchment that retains precipitation and storm water (Figure 8). This retention is a legacy of the historical containment structures and other topographic and hydrologic system modifications that were made to facilitate oil and water storage and containment operations on the SLO Tank Farm site. To this end, there are a series of depressional wetlands located throughout the southern portion of the SLO Tank Farm site that are either man-made (*e.g.,* within old containment berms for oil storage tanks – Wetlands #45, 55, 70, 81, 83, Figure 9) or relatively natural or excavated concave features that pond water for long (*e.g.,* 7-30 days) or very long (*e.g.* > 30 days) duration (*e.g.,* Wetlands #53, 54, 58, 60, 84, 85, 86, 90, 92, Figure 9). As observed in the depressions on the northern portion of the site, the southern depressions have bottoms that can consist of concrete, urban fill, or highly compacted soils. They also receive water from direct inputs of precipitation or via storm flows that emanate from the small sub-watersheds that surround them.

e. Relationship of SLO Tank Farm Site Hydrology to Waters/Wetland Delineations

For the purposes of determining federal CWA jurisdiction, the presence or absence of water in SLO Tank Farm waters/wetlands is usually the dominant parameter for determining final geometries of mapped polygons. In the case of the riverine features on the site (*e.g.,* the North Marsh/Tank Farm Creek and East Fork San Luis Obispo Creek systems), bed and bank features and ordinary high water (OHW) marks are often the principal hydrologic features that determine the lateral extent (width) of federal jurisdiction. That is, the lateral extent of many of the jurisdictional calls in these riverine waters/wetland is driven by the location of OHW on bank features and not by adjacent wetland boundaries.

With respect to depressional wetlands, soils on the SLO Tank Farm site are highly compacted as a consequence of grazing/trampling by domestic livestock, operation of machinery on soil surfaces, construction activities, *etc*. Consequently, they tend to pond water for long (*e.g.,* 7-30 days) or very long (*e.g*., >30 days) duration (Photographs 6 and 8). The geographic extent of these depressions is usually defined by the extent of long duration ponding, which is easily mapped during the wet season. At times, and in addition to ponding, we observed long duration saturation of soils to the surface. Saturation usually occurred in the large slope wetlands associated with the North Marsh/Tank Farm Creek complex, in smaller slope features, or in depressions that had been ponded for long duration but that were drying out as a result of evapotranspiration.

C. Soils

1. Natural Resources Conservation Service Mapping & Other Studies

The Natural Resources Conservation Service (NRCS) Soil Survey of San Luis Obispo County identifies and describes soils within the SLO Tank Farm project site as consisting of the Xererts-Xerolls-Urban land complex with 0-15 percent slopes (Figure 10) (Soil Survey Staff 2004). These soils have some hydric inclusions. Soils at the SLO Tank Farm project site also were described by Jenesis (2003). The WSP/Padre team confirmed the presence of the NRCS mapped soils unit on the SLO Tank Farm site.

The Xererts component of the Xererts-Xerolls-Urban land unit as mapped by NRCS makes up approximately 30 percent of this map unit. Xererts formed from weathered sedimentary rocks. Xererts soils are deep and well drained, with little available water to a depth of 60 inches. The Xererts component is not flooded, or ponded, and there is no zone of water saturation within 72 inches of the soil surface. The soil does not meet the hydric criteria. The Xererts component of the Xererts-Xerolls-Urban land complex includes Cropley or Diablo soils. Cropley soils are clays that occur on alluvial fans and plains. These soils form in alluvium that weathered from sedimentary rocks and typically are very dark gray to black in the top 32 inches.

The Xerolls component makes up 30 percent of the Xererts-Xerolls-Urban land map unit. Xerolls form from alluvium and/or residual materials derived from weathered sedimentary rock. This soil type is deep and well drained, with little available water to a depth of 60 inches. The Xerolls component is not flooded or ponded, and there is no zone of water saturation within 72 inches. The soil does not meet the hydric criteria. Urban land makes up 20 percent of the Xererts-Xerolls-Urban land map unit.

2. WSP/Padre Observations

On the SLO Tank Farm site, the WSP/Padre team observed that the modal soils have been disturbed extensively by historic petroleum fires, earthmoving equipment, filling, compaction by domestic livestock, and construction or demolition activities for the tank farm infrastructure. Consequently, much of the shape and physical characteristics of the soil materials have been altered. Given the types and degrees of disturbances to soils on the site, the hydric soil parameter usually is met via ponding or saturation to the surface for long (*e.g.*, 7-30 days) or very long (*e.g.*, >30 days) durations (National Technical Committee on Hydric Soils Criteria #3, Table 3). Ponding occurs frequently in compacted soils associated with very slight to pronounced concave microtopography on the site (Photographs 3, 6, 8, and 21). In the most highly compacted soils, it is not uncommon to observe non-saturated conditions immediately below ponding. If surface compaction of soils is not as pronounced, then some redoximorphic features can and often do develop within the upper 12 inches of soil profiles throughout the SLO Tank Farm site. These features include redox concentrations, redox depletions, oxidized rhizospheres, organic matter streaking and/or stripped matrices in sandy soils, gleying, and production of hydrogen sulfide

odors (especially in the North Marsh soils), *etc*. Soil colors vary a great deal throughout the site, given the amount of filling, earthwork, and import of concrete and other materials.

On a particular note, in areas around the old storage tank foundations is the presence of burned crude oil incorporated into many soil profiles. Depending on the type and intensity of fire that occurred in the area, residual burned crude oil can be present in forms ranging from relatively large aggregates up to 3-4 inches in mesh diameter, to small, pebble-sized granules. Structure of the granules can range from strong angular blocky to very weak, sub-angular blocky. Colors of aggregates depend greatly on the degree of weathering, but tend to range from dark brown to almost black (*e.g.*, Munsell [2000] Colors 10YR3/2 to 10YR 2/1). In some areas of the SLO Tank Farm, very dark and smooth, tar-like accumulations of residual oil will occupy the soil surface or interstices in desiccation cracks. These tar-like deposits will change markedly in viscosity with heating and become tacky to the touch or actually flow if the diurnal heat peak is intense. For the purposes of delineation, the residual oils incorporated in soil profiles are obvious and not confusing as either structure or morphology derived from saturation, low oxidation-reduction states, *etc*.

D. Vegetation

Vegetation on the site has been described by EDAW (1999), Jenesis (2003), and Rincon Associates (2003). However, a brief summary is provided in the following text.

1. General Description of SLO Tank Farm Vegetation

Plant communities along the streams of the central coast of California support a dynamic complement of native trees and other woody species, many of which can and do occur outside of the riparian corridor. Perhaps the most conspicuous feature of the mature, native riparian vegetation within the southern portion of California's central coast is the dominance of large coast live oaks (*Quercus agrifolia*). Stands of live oak range in density from woodland (wherein individual tree canopies do not interdigitate) to forest (*i.e.*, tree canopies overlap). These stands occur along stream terraces in the upper and middle reaches of moderately-sized riverine systems. The riparian overstory is mixed, with arroyo willow (*Salix lasiolepis*) and California walnut (*Juglans californica* var. *californica*) dominant in many places, particularly in the downstream reaches, such as at the East Fork of San Luis Obispo Creek on the SLO Tank Farm site.

The understory along the East Fork of San Luis Obispo Creek has been disturbed throughout the reach on the SLO Tank Farm site, and supports a mix of native and nonnative plant species. Understory shrubs occurring on creek banks include coyote brush (*Baccharis pilularis*) and California sage (*Artemisia californica*) where the canopy is open, and blackberries (California blackberry [*Rubus ursinus*] and Himalayan blackberry [*Rubus discolor*]) in both sun and shade. Herbaceous species occurring in the riparian corridor include mugwort (*Artemisia douglasiana*), poison hemlock (*Conium maculatum*), smilo grass (*Piptatherum miliaceum*), wild oats (*Avena barbata, A. fatua*), and Italian thistle (*Carduus pycnocephalus*).

In the less disturbed stream reaches in this geographic region, typically higher in the watershed than the SLO Tank Farm site, large oaks are joined by white alder (*Alnus rhombifolia*) and western sycamore (*Platanus racemosa*) as dominants, particularly immediately adjacent to the stream channel. In addition to these tree species, the riparian plant communities (*i.e.*, vegetation adjacent to, and influenced by, the presence of moving water), consist of a small suite of native shrubs and vines found in the understory. Poison oak (*Toxicodendron diversiloba*) is ubiquitous, as is California blackberry (*Rubus ursinus*). Less common, but still frequently occurring in the shrub layer, are several species of gooseberry (*Ribes* spp.) and honeysuckle (*Lonicera* spp.). These taxa are critically important food sources for the native fauna, providing a varied and abundant source of berries throughout much of the year. In the low elevation coastal plain, willows and California walnut are prominent in the lowland riparian ecosystems. Native oak savannah/bunch grass mosaic is the reference standard condition in upland areas along the riparian corridor.

Invasion by exotic species is a significant concern in California. Many streams in the region are now completely devoid of a native riparian ecosystem, consisting instead of a large suite of exotic Eurasian weeds (*e.g., Bromus diandrus, Carduus pycnocephalus, Melilotus officinale, Piptatherum miliaceum, Sonchus oleraceus*), ornamental escapes (*e.g., Delairea odorata* [*Senecio mikanioides*], *Tropaeoleum majus, Vinca major*), or a planted riparian corridor of nonnative trees (*e.g., Eucalyptus globulus*).

Grassland areas within the region which are not frequently disturbed are characterized by a native perennial bunch grassland community type which has an occasional tree or shrub (*e.g.*, Mexican elderberry [*Sambucus mexicana*]). Grassland species found in the SLO Tank Farm site (EDAW 1999) include ripgut brome, soft chess (*Bromus hordeaceus*), purple needlegrass (*Nasella pulchra*), tarweed (*Deinandra congesta* ssp. *luzulifolia* and *Centromadia parryi* ssp. *congdonii*), owl's clover (*Castilleja densiflora* ssp. *obispoensis*), and fennel (*Foeniculum vulgare*). Exotics occurring in frequently disturbed areas within the uplands include yellow star-thistle (*Centaurea solstitalis*) intermixed with non-native grasses and herbaceous species such as wild oats (*Avena barbata*), soft chess (*Bromus hordeaceus*), annual fescue (*Vulpia myuros* var. *hirsuta*), perennial ryegrass (*Lolium perenne*), rip-gut brome (*Bromus diandrus*), black mustard (*Brassica nigra*), Russian thistle (*Salsola iberica*), wild radish (*Raphanus sativus*), and sweet fennel (*Foeniculum vulgare*).

Five special status plant species have been observed within the project site. These species are Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*), Hoover's button-celery (*Eryngium aristatulum* var. *hooveri*), San Luis Obispo County morning glory (*Calystegia subacaulis* ssp. *subacaulis*), Obispo Indian paintbrush (*Castilleja densiflora* ssp. *obispoensis*), and San Luis Obispo serpentine dudleya (*Dudleya abramsii* ssp. *bettinae*). All five species are California Native Plant Society (CNPS) List 1B species.

2. Wetland Classes

Three classes of wetlands (*sensu* Brinson 1993) are found at the project site – depression, slope, and riverine with associated riparian communities, with the North Marsh/Tank Farm Creek representing a slope/riverine complex (Figure 6). Each class is described in the following text.

a. Depressional Waters/Wetlands

Most if not all of the depressional waters/wetlands on the SLO Tank Farm project site are not natural features of the landscape (Photographs 6 and 8). Depressional waters/wetlands have formed as a result of site activities, specifically, they are found in the bottom of the old storage tanks, at the base of human made berms surrounding the tanks, and as isolated depressions resulting from the site's long history of ranching and industrial use. While many of the depressions support no vegetation for all or a portion of the year, some of them support large populations of rare plant species, including Congdon's tarplant and Hoover's button-celery. Other species commonly present include foxtail fescue (*Vulpia myuros*), rabbit's foot grass (*Polypogon monspeliensis*), dwarf wooly marbles (*Psilocarphus brevissimus*), popcorn flower (*Plagiobothry undulatus*), spikerush (*Eleocharis* spp.), birdfoot trefoil (*Lotus corniculatus*), and various native and widespread rushes (*Juncus bufonius* var. *bufonius, J. phaeocephalus, J. tenuis, J. xiphioides*).

b. Slope Waters/Wetlands

Few slope wetlands are found on the SLO Tank Farm site. Those present are primarily the result of the ditching, diking and berming from both ranching and industrial activities.

c. Slope/Riverine Waters/Wetlands Complex

A large slope/riverine wetland known as the North Marsh/Tank Farm Creek occurs on the northern portion of the SLO Tank Farm (Photograph 7). This wetland complex resulted from the impoundment and subsequent sedimentation of an unnamed second order channel of San Luis Obispo Creek due to the construction of Tank Farm Road. This construction transformed a riverine wetland ecosystem into a slope riverine proximal wetland type. Currently, the North Marsh is dominated by bulrush (*Schoenoplectus acutus*), *Eleocharis macrostachya* and common cattail (*Typha latifolia*). Curly dock (*Rumex crispus*), chain speedwell (*Veronica catenata*), and the rare Congdon's tarplant are also present, sometimes locally abundant.

Where Tank Farm Creek flows upgradient of the North Marsh, vegetation within the channel is dominated by widespread palustrine persistent and non-persistent emergent species. These include common cattail and water plantain (*Alisma plantago-aquatica*), as well as the common curly dock, water speedwell, among others. Several isolated arroyo willows occur along the banks, particularly within the upper reach of Tank Farm Creek on the SLO Tank Farm site.

d. Riverine Waters/Wetlands & Associated Riparian Zones

Two prominent riverine features, East Fork of San Luis Obispo Creek and Tank Farm Creek, comprise most of the riverine waters/wetlands on the Project Site. However, a notable number of artificial drainage ditches have been constructed, again, as a result of site history. Tank Farm Creek, itself, is largely an artificial ditch, clearly the result of relocation of the original creek channel to facilitate ranching and industrial uses. This is particularly true below Tank Farm Road, where the creek takes the form of several large, parallel, and intricately plumbed ditches that drain to the southeastern corner of the Project Site. Vegetation associated with this drainage network reflects primarily weedy native and non-native species described previously.

The East Fork of San Luis Obispo Creek is a highly entrenched channel with members of the native riparian forest found upslope within the riparian slopes (Photograph 14 and 15). California walnut, Fremont cottonwood (*Populus fremontii*), western sycamore, Mexican elderberry, Coast live oak and arroyo willow are most common. Above ordinary high water the vegetation is primarily the annual grassland dominated by Italian ryegrass, slender wild oat, soft chess, bermuda grass (*Cynodon dactylon*), with remnant native elements, such as purple needlegrass, coyote brush, and California buttercup (*Ranunculus californicus*).

VI. REGULATORY CONTEXTS

Three levels of government have jurisdiction over the waters/wetlands on the Tank Farm property. These jurisdictions include the U.S. Federal government, the State of California, and San Luis Obispo County. A summary of each level of jurisdiction is presented below.

A. Federal Jurisdiction

1. Clean Water Act (CWA), Section 404

As reported above, the delineation and mapping of the geographic extent of waters of the U.S., including wetlands, shows that there are waters/wetlands within the Chevron Tank Farm Project Site. Section 404 of the CWA requires authorization from the US ACOE for the discharge of dredged or fill material into all waters of the United States, including wetlands. This delineation is conditional upon a field review and final jurisdictional determination by the US ACOE, Los Angeles District. Recent decisions in the U.S. Supreme Court (*i.e.*, Solid Waste Agency of Northern Cook County [SWANCC] v. US ACOE (531 U.S. 159, 2001) January 9, 2001; Rapanos *et ux.*, *et al.* v. United States, June 19, 2006) require a careful examination and documentation of the physical location(s) and hydrologic characteristics of waters/wetlands. Particular focus is given to surface hydrologic connections to "navigable waters in fact," and/or adjacency and thus a significant nexus to interstate commerce.

As addressed in Section IV.B., federal guidance for field delineation procedures that address the Rapanos decision has been offered by the EPA and the US ACOE in a joint memorandum issued June 5, 2007. Permanent to intermittent stream flow in Tank Farm Creek and East Fork of San Luis Obispo Creek passes through and across the SLO Tank Farm site, converging immediately south of the project boundary. This reach of the East Fork then joins the main stem of San Luis Obispo Creek, where flow is perennial. San Luis Obispo Creek flows year round to the Pacific Ocean, where it enters tidal waters at the town of Avila, San Luis Obispo County. Waters/wetlands on the Project Site have direct hydrologic connection to a navigable water in fact, and therefore are regulated by CWA §404.

2. Clean Water Act, Section 401

Section 401 of the CWA addresses water quality in the nation's waters, including wetlands. The State of California administers §401. Please see B.1 and 2 below.

3. Clean Water Act, Section 402

Section 402 of the CWA addresses the discharge of pollutants from point sources into the Nation's surface waters. The State of California administers §402. Please see B.3 below.

4. Endangered Species Act, Section 7 (U.S. Fish and Wildlife Service)

Projects that require a CWA §404 permit are obligated to show consistency with the provisions of §7 (or §10, depending on the applicant) of the federal Endangered Species Act of 1973. The purpose of the ESA is ". . . to provide a means whereby the ecosystems upon which endangered species and threatened species depend upon may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions as set forth in subsection (a) of this section."

Section 7 requires interagency consultation to protect listed species. Under Section 7(a)(1) federal agencies are directed, in consultation with the Service, to use their resources to further the purposes of the act. Section 7(a)(2) precludes federal agencies from authorizing, funding, or carrying out any activities that are likely to jeopardize the continued existence of any listed species or result in the adverse modification of critical habitat. Section 7 of the Endangered Species Act of 1973 is administered by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

Two species protected by the federal ESA is found on the SLO Tank Farm site, and both listed as "threatened." The vernal pool fairy shrimp (*Branchinecta lynchi*) is found in many of the depressional and riverine features, as documented by a comprehensive survey (wet and dry seasons) by Rincon Consultants (2005). South-central California coast steelhead ESU (*Oncorhynchus mykiss*) is known to occur in the East Branch of San Luis Obispo Creek. Therefore, a (at minimum, informal) Section 7 consultation will be required prior to any site activities.

5. National Historic Preservation Act (NHPA), Section 106

For any projects that require a CWA §404 permit, applicants are obligated to show consistency with the provisions of §106 of the National Historic Preservation Act of 1966. Section 106 of NHPA granted legal status to historic preservation in Federal planning, decision-making, and project execution. Section 106 requires all Federal agencies to take into account the effects of their actions on historic properties, and provide a reasonable opportunity to comment on those actions and the manner in which Federal agencies are taking historic properties into account in their decisions (http://www.achp.gov/overview.html). Section 106 of the National Historic Preservation Act is administered by the State of California Historic Preservation Officer (See B.6 below).

B. California State

As described above, approximately 72.2 acres of waters/wetlands and/or wetland features exist at the SLO Tank Farm site. These waters/wetlands will be regulated under CWA Section 401, 402, California Department of Fish & Game, and the State Historic Preservation Officer under the authority of the National Historic Preservation Act, among others.

1. Clean Water Act (Water Quality Certification), Section 401

Section 401 of the CWA requires that federal agencies issuing licenses or permits for construction or other activities obtain a written certification that the activity will not cause or contribute to a violation of the state's water quality standards. After receiving the certification, the federal agency issuing the permit must include conditions in the permit to prevent the project from degrading water quality of a downstream state or tribe. The CWA's 401 certification requirement applies to many types of permits and is an important tool for states and tribes to control projects that might degrade state waters. Work involving discharges to waters/wetlands must be reviewed by the State of California Regional Water Quality Control Board in the context of the Clean Water Act 401 Water Quality Certification Program.

2. Porter-Cologne Water Quality Act

The Porter-Cologne Water Quality Act was enacted in 1969 under the California Water Code §§13000 *et seq.* Its purpose is ". . . to preserve, enhance and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations." The Act established the State Water Resources Control Board and nine Regional Water Quality Control Boards as the principal state agencies with the responsibility for controlling water quality in California (see B.1. above). Under the Porter-Cologne Water Quality Act, the State Board has the ultimate authority over State water rights and water quality policy; the nine regional boards oversee water quality on a day-to-day basis at the regional level by (1) determining beneficial uses of water for all bodies of water in their area; (2) establishing and enforcing water quality standards for both surface and groundwater; and (3) taking any and all actions needed to maintain the standards by controlling point and non-point sources of pollution.

3. Clean Water Act, Section 402

Work involving discharges to waters/wetlands must be reviewed by the State of California in the context of the Clean Water Act §402, which regulates discharges pollutants from point sources into surface waters under the National Pollutant Discharge Elimination System permit (NPDES) program. The NPDES program is implemented either by the EPA, or in California, by the State Water Quality Control Board. The NPDES program requires those implementing projects involving discharges to waters/wetlands to have a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP is reviewed by the Regional Water Quality Control Board and the city or county in which the project takes place. The Central Coast Regional Water Quality Control Board is headquartered in San Luis Obispo.

4. Stream Bed Alteration – Section 1600 Series Permit

The California Department of Fish and Game administers §§1600-1607 of the Fish & Game Code. Sections 1600-1607 address any project that will "(1) divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake designated by the department [California Fish and Game] in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit, (2) use materials from the streambeds

designated by the department, or (3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass in to any river, stream, or lake designated by the department" (Section 1601) (http://www.dfg.ca.gov/1600/). A 1600 series permit is required in any water or wetland with bed and bank features.

On the Chevron Tank Farm Project Site, only those wetlands that occur within the riparian zone of any stream, river or lake would be regulated by DFG under the 1600 series public resource code. The only stream, river or lake features on the SLO project site are the Tank Farm Creek riverine complex and the East Fork of San Luis Obispo Creek. As such, these riverine waters/wetlands on the SLO tank farm project site are within DFG jurisdiction given by Section 1600-1616.

5. California Environmental Quality Act (CEQA)

The California Environmental Quality Act, made into law in 1970, requires state and local agencies to identify significant environmental impacts of their actions, and to avoid and mitigate those impacts where feasible (California Public Resources Code §§21000-21177). Depending upon the type and extent of the project, different level(s) of environmental analysis may be required, and make take the form of an Environmental Impact Report (EIR) or Negative Declaration (ND).

6. National Historic Preservation Act, Section 106

As part of the CWA §404 permit review process, the US ACOE is obliged to review records kept by the State Historic Preservation Officer (SHPO) to determine if the proposed project will (or is likely to) impact cultural resources. In addition, if cultural resources are encountered during any work that may occur at the Property, the appropriate state agencies must be notified.

7. Regional Water Quality Control Board (RWQCB) (CWA 401)

Work involving discharges to waters/wetlands needs to be reviewed by the State of California Regional Water Quality Control Board (RWQCB) in the context of the Clean Water Act 401 Water Quality Certification Program.

8. California Coastal Commission (CCC)

The project area that includes the delineated waters/wetlands is **not** within Coastal Zone of the Pacific Ocean. Therefore, the delineation will **not** need to be reviewed by the California Coastal Commission.

C. Local Jurisdiction - San Luis Obispo County

Standard measures for building, grading and encroachment permits, including sediment and erosion control, will need to be followed to prevent inadvertent discharges to waters/wetlands.

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TABLES

Table 1. Delineations of Waters of the U.S., Including Wetlands Conducted at the Chevron Tank Farm, San Luis Obispo, California.

Source	***Date***	***Survey Methodology***	***Federal Wetlands (acres)***	***"Other" Waters of the U.S. (acres)***	***"One Parameter" Wetlands (acres)***	**Waters/ Wetlands Supporting Special-Status Species**	***Flags/Electronic Locations – Record?***	***Map?***	***Data Sheets – Delineation?***	***Report?***
EDAW, Inc. Sacramento, CA	1999	Routine Wetland Delineation based on USACE 1987 Manual	57.2	1.4	--	--	No	Yes	Yes	Yes
BBL Santa Barbara, CA	1999/ 2003	Map only – synthesized from EDAW, 1999 No wetland delineation/survey was conducted	57.2	1.4	--	--	No	Yes	No	No
Jenesis Avila Beach, CA	2003	"State" Wetland Delineation based on CDFG/USFWS definition	57.2	1.4	18.75	--	No	Yes	Yes	Yes
Ted Winfield & Associates Livermore, CA	2001	Re-evaluation of jurisdictional waters of the U.S. based on EDAW, 1999 data/map and site reconnaissance survey to verify isolated wetlands	Not Cited*[1]	Not Cited*[1]	Not Cited*[1]	--	No	Yes	No	Yes
Rincon Consultants, Inc. San Luis Obispo, CA	2003	Vernal pool fairy shrimp (VPFS) wet/dry season surveys (No wetland delineation was conducted)	--	--	--	--	Yes	Yes	No	Yes
WSP/Padre Associates, Inc. San Luis Obispo, CA	2007- 2008	Routine Wetland Delineation based on USACE 1987 Manual (Wetland delineations were performed in new areas only)	49.0	3.9	3.4	15.82	Yes	Yes	Yes	Yes

*[1] The Ted Winfield & Associates letter-report dated November 29, 2001 includes a map depicting the re-evaluation of jurisdictional wetlands; however, the exact acreage of jurisdictional and isolated wetlands is not included in the letter-report.

Table 2. Waters/Wetland Areas Removed, Adjusted, or Added Based on 2007-2008 Field Observations by WSP/Padre Technical Team, Chevron Tank Farm, San Luis Obispo, California.

Waters/Wetlands Number or Sample Point	***Waters/Wetlands Removed***	***Boundary Adjustment(s)***	***Waters/Wetlands Added***	***Source Map***		
				BBL*1	Jenesis*2	WSP/Padre
1	X			X		
8	X			X		
9		X		X		
11		X		X		
12		X		X		
30		X		X		
34		X		X		
69		X		X		
70		X		X		
71		X		X		
76	X			X		
77		X		X		
78		X		X		
79		X		X		
80		X		X		
81	X			X		
82		X		X		
84		X		X		
85		X		X		
86		X		X		
100	X			X		

Table 2 cont'd.

Waters/Wetlands Number or Sample Point	***Waters/Wetlands Removed***	***Boundary Adjustment(s)***	***Waters/Wetlands Added***	***Source Map***		
				BBL*1	Jenesis*2	WSP/ Padre
101	X			X		
105		X		X		
109		X		X		
S-3/4/5	X				X	
S-12		X			X	
S-19	X				X	
Small wetland between S-19 and S-20	X				X	
S-20	X				X	
S-23	X				X	
S-24	X				X	
S-25	X				X	
S-28	X				X	
S-32		X			X	
S-33	X				X	
3			X			X
4			X			X
15			X			X
20			X			X
24			X			X
31			X			X
61			X			X
85			X			X
86			X			X

*1 The BBL map and the Ted Winfield & Associates map (2001) were synthesized from the EDAW, Inc. map (1999). BBL wetland numbers listed in Table 2 correspond directly to the wetlands on the EDAW, Inc. map and the Ted Winfield & Associates map, therefore, these maps are not included above.

*2 The Jenesis map (2003) labels only sample points (S-19, etc.); each wetland feature is not numbered.

Table 3. Criteria for Hydric Soils of the United States (Federal Register 2002).

Hydric soil criteria:

1. All Histels except for Folistels, and Histosols except for Folists, or
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Aquisalids, Historthels, and Histoturbels great groups, and Cumulic or Pachic subgroups that:
    a. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
    b. are poorly drained or very poorly drained and have either:
        (1) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
        (2) a water table at a depth of 0.5 foot or less during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
        (3) a water table at a depth of 1.0 foot or less during the growing season if permeability is less than 6.0 in/hr in any layer within a depth of 20 inches, or
3. Soils that are frequently ponded for periods of long or very long duration during the growing season or,
4. Soils that are frequently flooded for periods of long or very long duration during the growing season.

Table 4. U.S. Fish & Wildlife Service plant indicator status (Reed 1988, 1993).

Indicator Status	Definition
Obligate Wetland (OBL)	Occur almost always (estimated probability > 99%) under natural conditions in wetlands.
Facultative Wetland (FACW)	Usually occur in wetlands (estimated probability 67%-99%), but occasionally found in non-wetlands.
Facultative (FAC)	Equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).
Facultative Upland (FACU)	Usually occur in non-wetlands, but occasionally found in wetlands (1%-33%).
Obligate Upland (UPL)	Occur in wetlands in another region, but occur almost always (estimated probability > 99%) under natural conditions in non-wetlands in the region specified.
No Indicator Status (NI)	Insufficient information exists to assign an indicator status.
Not Listed (NL)	Not on the National List in any region.

Table 5. Summary of the Distribution of Waters of the U.S. Including Wetlands and Other Wetland Features at the Chevron Tank Farm, San Luis Obispo, California.

		Waters/Wetlands HGM*[1] Class			***Waters/Wetlands Jurisdiction***				***Special-status Species***					
Wetland Number	***Area (acres)***	Slope/Riverine Complex	Depression	Riverine	Federal Clean Water Act (CWA)	Federal "Other" Waters" of the U.S.	Not Under Federal CWA Jurisdiction And Which Do Not Support Special Status Species	Not Under Federal CWA Jurisdiction But Which Do Support Special Status Species	Vernal Pool Fairy Shrimp	Congdon's tarplant	Hoover's button-celery	SLO morning-glory	Purple needlegrass	South-Central California Coast Steelhead
1	0.07		X				X							
2	0.02		X				X							
3	0.04		X				X							
4	0.01		X				X							
5	0.07		X					X		X	X			
6	0.02		X				X							
7	0.04		X				X							
8	0.04		X				X							
9	0.30	X			X									
10	0.02	X			X									
11	0.05	X			X									
12	16.33	X			X					X				
13	0.09		X				X							
14	0.03		X				X							
15	0.11		X				X							
16	0.33		X					X	X	X				

Table 5. Cont'd.

Wetland Number	Area (acres)	Waters/Wetlands HGM*[1] Class			Waters/Wetlands Jurisdiction				Special-status Species					
		Slope/Riverine Complex	Depression	Riverine	Federal Clean Water Act (CWA)	Federal "Other" Waters" of the U.S.	Not Under Federal CWA Jurisdiction And Which Do Not Support Special Status Species	Not Under Federal CWA Jurisdiction But Which Do Support Special Status Species	Vernal Pool Fairy Shrimp	Congdon's tarplant	Hoover's button-celery	SLO morning-glory	Purple needlegrass	South-Central California Coast Steelhead
17	0.14		X					X	X	X				
18	0.09		X					X	X	X				
19	0.21		X					X		X				
20	0.00		X					X						
21	0.23		X					X	X	X				
22	0.01		X					X	X	X				
23	0.04	X			X				X	X				
24	0.01		X					X		X				
25	0.07		X					X	X	X				
26	0.09		X					X	X	X				
27	0.08		X					X		X				
28	0.02		X					X		X				
29	0.44		X		X				X	X				
30	0.44		X		X				X	X				
31	0.01		X		X									
32	0.34		X		X				X	X				
33	0.53		X		X				X	X	X			
34	0.64	X			X					X				

Table 5. Cont'd.

Wetland Number	Area (acres)	Waters/Wetlands HGM*[1] Class			Waters/Wetlands Jurisdiction				Special-status Species					
		Slope/Riverine Complex	Depression	Riverine	Federal Clean Water Act (CWA)	Federal "Other" Waters" of the U.S.	Not Under Federal CWA Jurisdiction And Which Do Not Support Special Status Species	Not Under Federal CWA Jurisdiction But Which Do Support Special Status Species	Vernal Pool Fairy Shrimp	Congdon's tarplant	Hoover's button-celery	SLO morning-glory	Purple needlegrass	South-Central California Coast Steelhead
35	0.05		X		X				X	X				
36	0.03		X		X				X	X				
37	0.40		X		X				X	X				
38	0.21	X			X				X	X				
39	0.22	X			X				X	X	X			
40	0.27	X			X									
41	0.12	X			X									
42	2.99	X			X					X		X		
43	6.92	X			X					X		X		
44	2.35		X		X				X	X		X		
45	2.03		X					X	X	X				
46	0.14		X					X	X	X				
47	0.06		X					X	X	X				
48	0.00		X		X				X					
49	0.07		X		X				X					
50	1.52	X			X				X	X				
51	1.21		X		X				X	X				
52	0.18		X					X	X	X				

Table 5. Cont'd.

Wetland Number	Area (acres)	Waters/Wetlands HGM*[1] Class			Waters/Wetlands Jurisdiction				Special-status Species					
		Slope/Riverine Complex	Depression	Riverine	Federal Clean Water Act (CWA)	Federal "Other" Waters" of the U.S.	Not Under Federal CWA Jurisdiction And Which Do Not Support Special Status Species	Not Under Federal CWA Jurisdiction But Which Do Support Special Status Species	Vernal Pool Fairy Shrimp	Congdon's tarplant	Hoover's button-celery	SLO morning-glory	Purple needlegrass	South-Central California Coast Steelhead
53	0.98		X		X				X	X				
54	2.17	X			X				X	X				
55	2.59		X		X					X				
56	0.22		X		X				X	X				
57	0.01		X		X				X					
58	0.21		X		X				X	X	X	X		
59	0.23		X					X		X		X		
60	0.09		X					X	X	X				
61	0.01		X				X							
62	0.64		X					X		X				
63	0.67		X		X				X	X				
64	0.44		X					X		X				
65	1.64		X		X				X					
66	0.07		X				X							
67	0.03		X					X	X	X				
68	0.03		X					X	X	X				
69	0.90		X					X	X	X				
70	2.76		X				X							

Table 5. Cont'd.

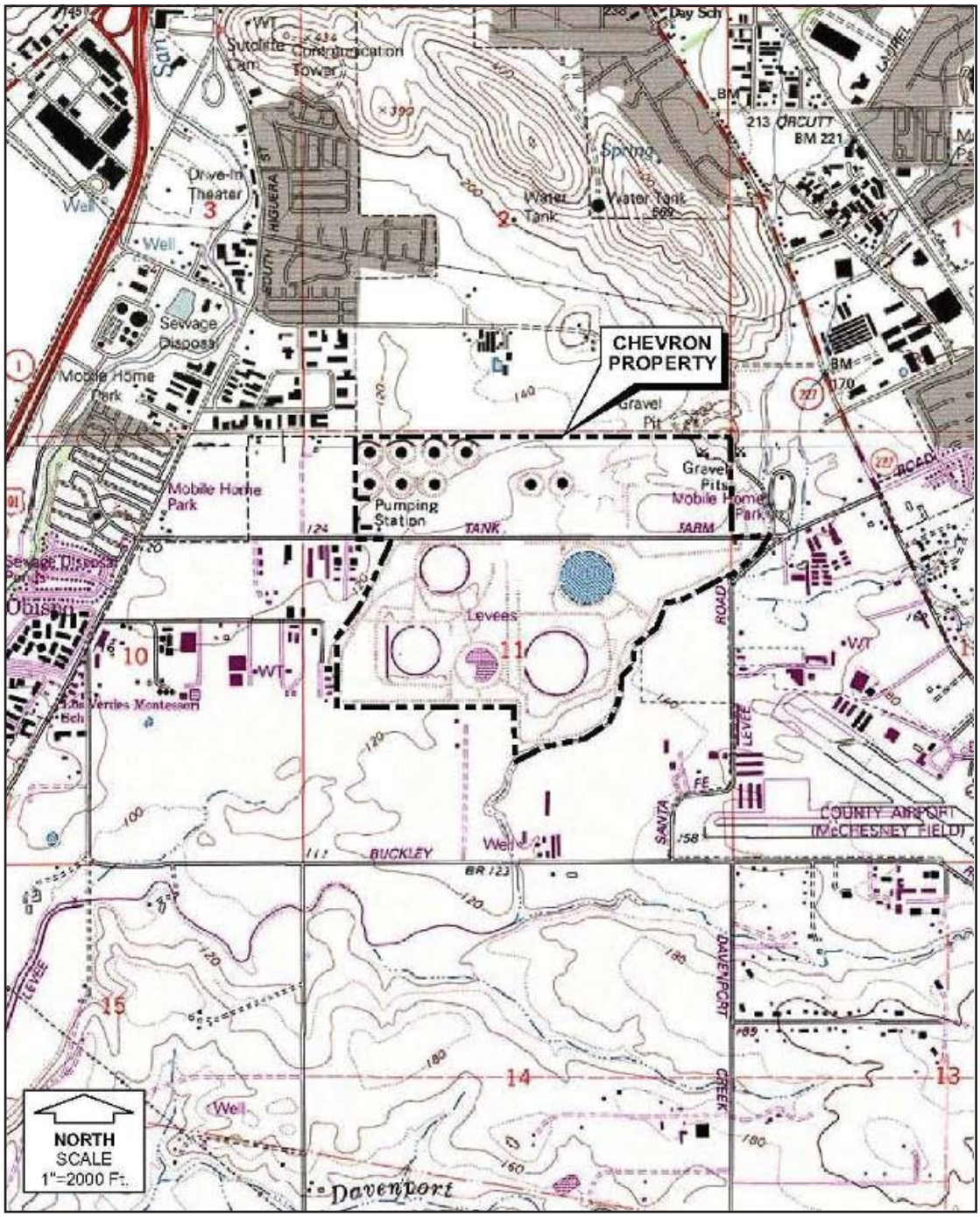
Wetland Number	Area (acres)	Waters/Wetlands HGM*[1] Class			Waters/Wetlands Jurisdiction				Special-status Species					
		Slope/Riverine Complex	Depression	Riverine	Federal Clean Water Act (CWA)	Federal "Other" Waters" of the U.S.	Not Under Federal CWA Jurisdiction And Which Do Not Support Special Status Species	Not Under Federal CWA Jurisdiction But Which Do Support Special Status Species	Vernal Pool Fairy Shrimp	Congdon's tarplant	Hoover's button-celery	SLO morning-glory	Purple needlegrass	South-Central California Coast Steelhead
71	0.10		X					X	X	X				
72	0.38		X					X	X	X				
73	0.08		X				X							
74	0.88		X		X				X	X				
75	0.75		X		X				X	X				
76	1.83		X		X				X	X		X		
77	1.27		X					X	X	X				
78	0.07		X					X	X	X				
79	0.21		X					X	X	X				
80	0.47		X					X	X	X				
81	1.36		X					X		X				
82	0.49		X					X	X	X				
83	4.24		X					X	X	X				
84	0.10		X					X	X	X				
85	0.05		X					X		X				
86	0.02		X					X	X	X				
87	0.01		X					X		X				
88	0.27		X					X	X	X	X			

Table 5. Cont'd.

Wetland Number	Area (acres)	Waters/Wetlands HGM*[1] Class			Waters/Wetlands Jurisdiction				Special-status Species					
		Slope/Riverine Complex	Depression	Riverine	Federal Clean Water Act (CWA)	Federal "Other" Waters" of the U.S.	Not Under Federal CWA Jurisdiction And Which Do Not Support Special Status Species	Not Under Federal CWA Jurisdiction But Which Do Support Special Status Species	Vernal Pool Fairy Shrimp	Congdon's tarplant	Hoover's button-celery	SLO morning-glory	Purple needlegrass	South-Central California Coast Steelhead
89	1.81		X		X				X	X				
90	0.31		X					X		X				
91	0.06		X					X		X				
92	0.09		X					X	X	X				
93	0.21		X		X				X	X				
94	0.02			X		X								
95	0.00			X		X								
96	0.01			X		X								
97	0.04			X		X								
98	0.64			X		X								
99	3.18		X	X		X								X
100	0.05		X					X		X				
101	0.01		X				X							
102	0.15		X					X						
103	0.09		X					X						
Total acres:	**72.2**	**31.8**	**36.5**	**3.9**	**49.0**	**3.9**	**3.4**	**15.8**	**31.1**	**63.8**	**1.3**	**14.5**	**0.0**	**3.2**

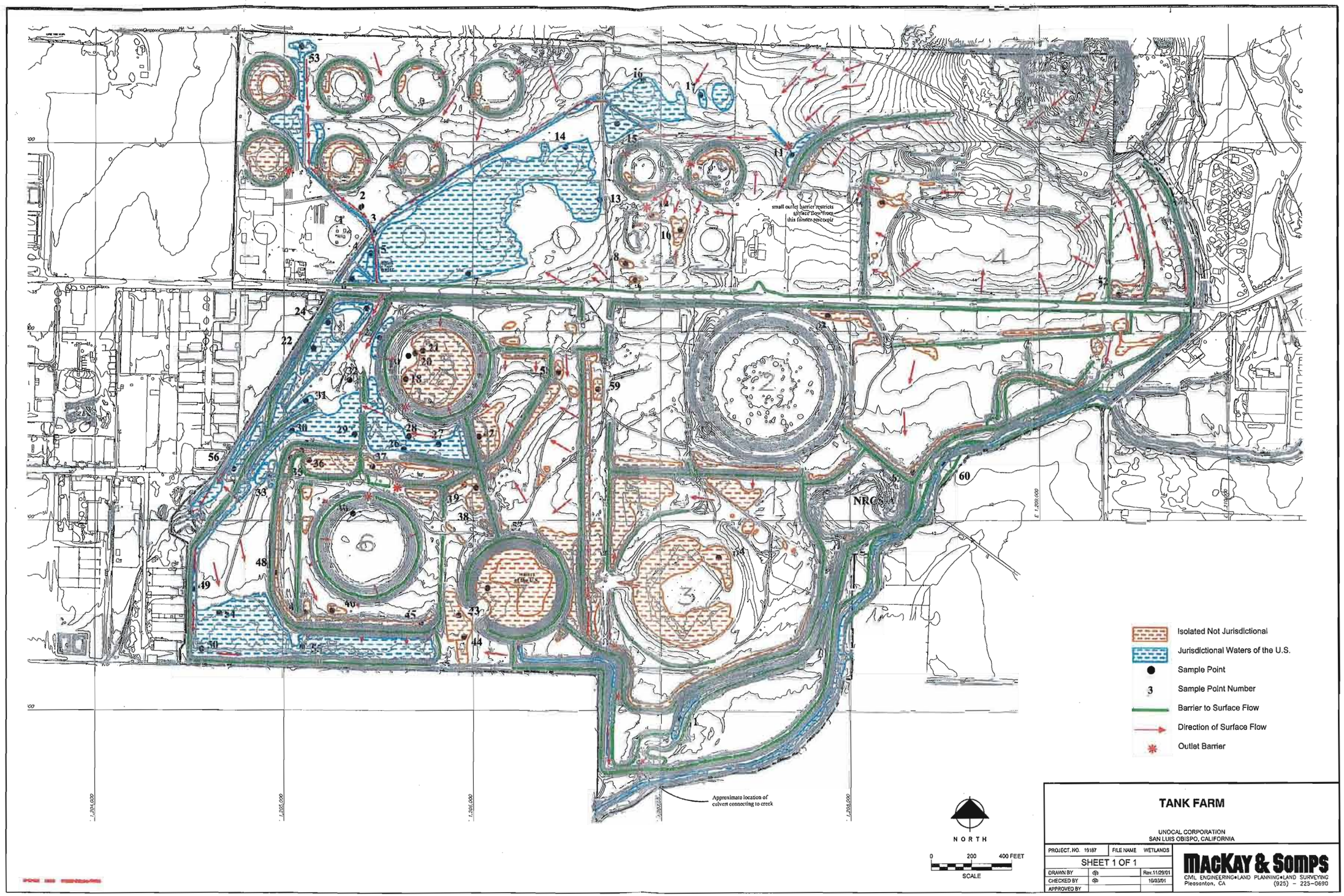
*[1] Hydrogeomorphic (HGM) Class (following Brinson, 1993)

FIGURES



CHEVRON SLO TANK FARM PROJECT SITE LOCATION
SAN LUIS OBISPO, CALIFORNIA
(FROM PADRE ASSOCIATES, INC 2007)
FIGURE - 1

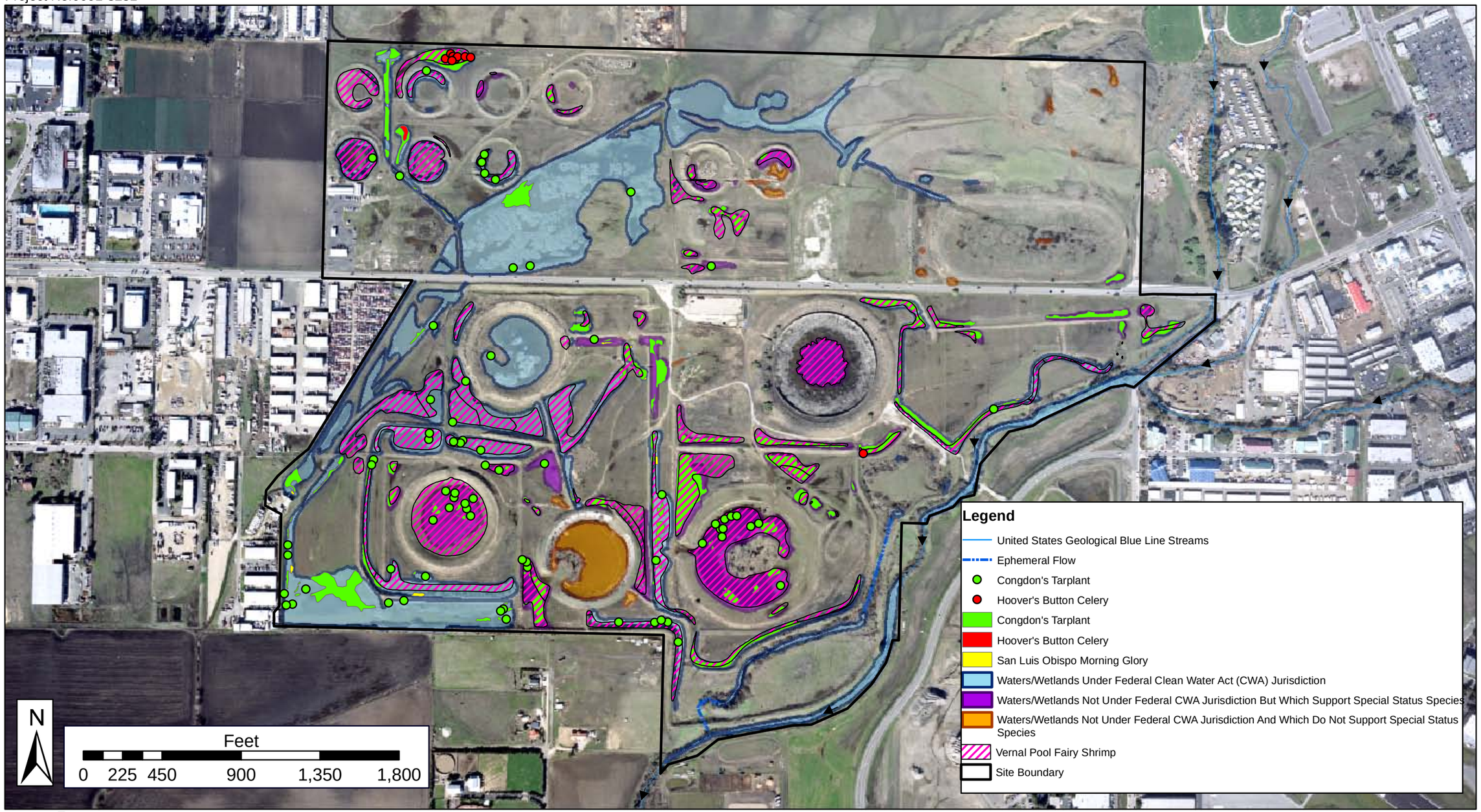
AERIAL IMAGE OF CHEVRON SLO TANK FARM PROJECT SITE
(FLIGHT DATE 2-4-08)
FIGURE - 2



Waters of the U.S., Including Wetlands Mapped by Winfield (2001)

Figure - 3

June 2008
Project No.0601-3281

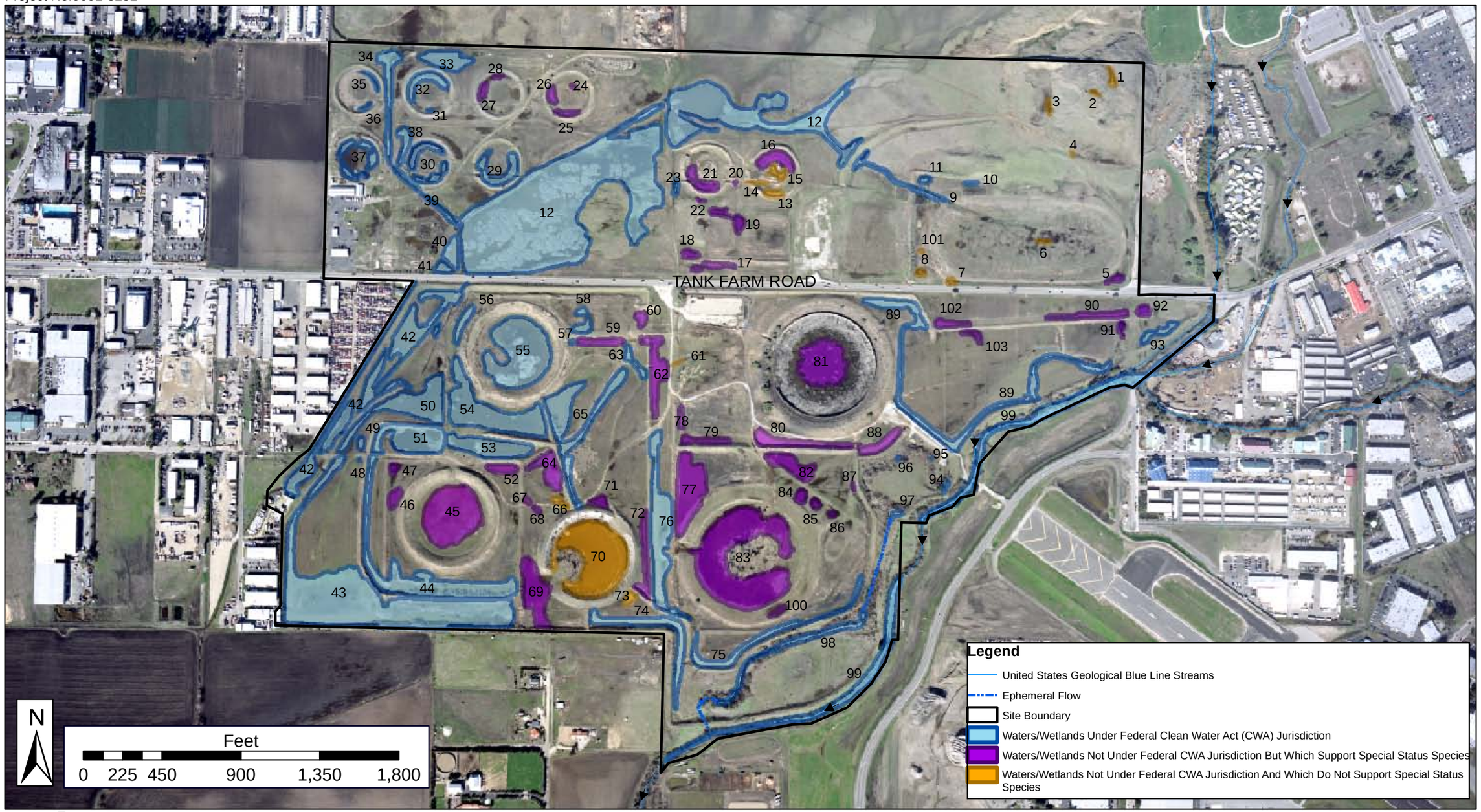


padre associates, inc. ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS
WSP

DISTRIBUTION OF PROTECTED PLANT AND ANIMAL SPECIES WITHIN WATERS OF THE US INCLUDING WETLANDS
FIGURE - 4

Chevron EMC – San Luis Obispo Tank Farm Restoration and Re-development Project

June 2008
Project No.0601-3281



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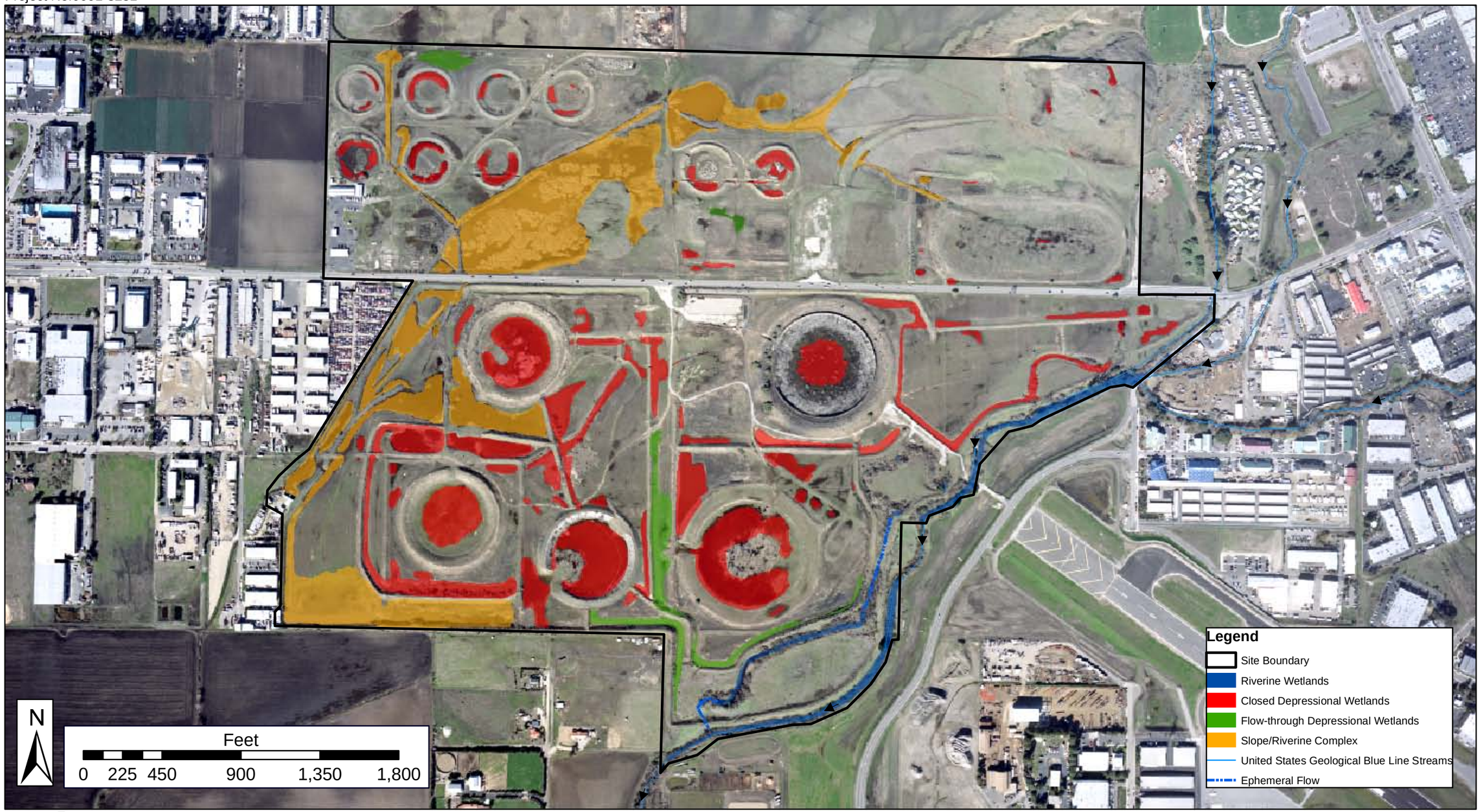
WSP

WATERS OF THE US INCLUDING WETLANDS
FIGURE - 5

Chevron EMC – San Luis Obispo Tank Farm Restoration and Re-development Project

June 2008
Project No.0601-3281



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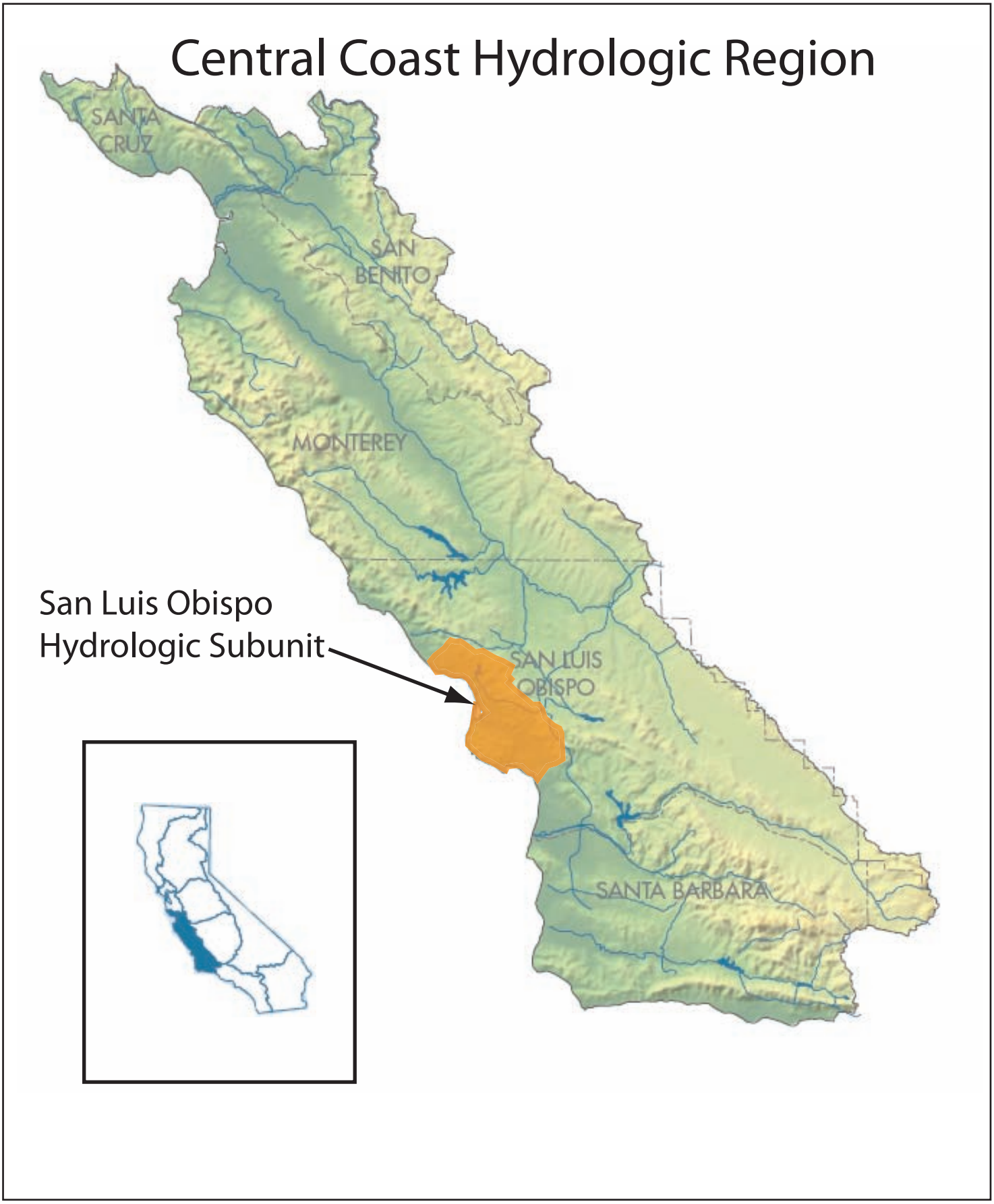
WSP

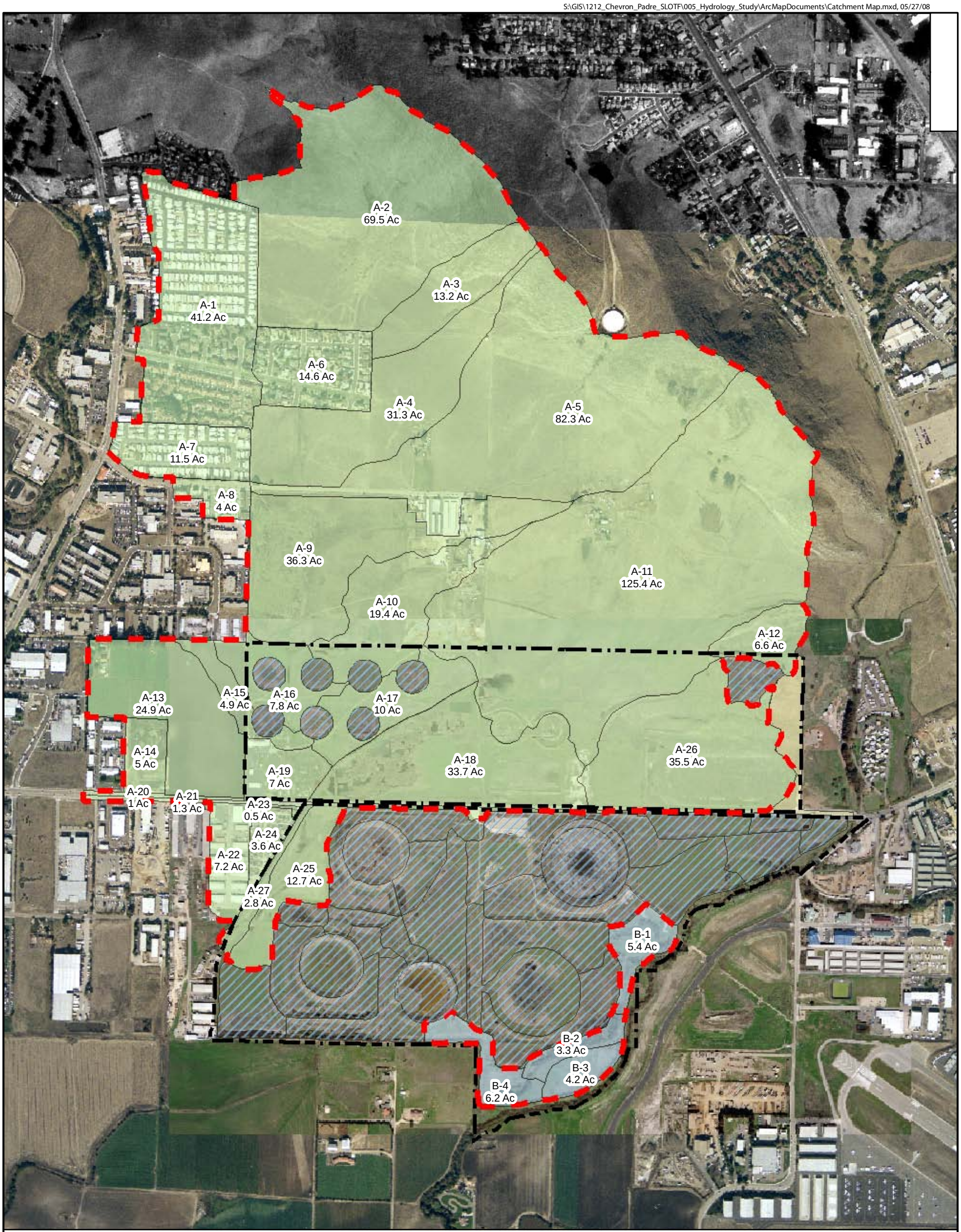
HGM WETLAND CLASSES (FOLLOWING BRINSON, 1993; AND BRINSON et al., 1995)
FIGURE - 6

Chevron EMC – San Luis Obispo Tank Farm Restoration and Re-development Project



THE CENTRAL COAST HYDROLOGIC REGION AND SAN LUIS OBISPO HYDROLOGIC SUBUNIT FIGURE - 7

S:\GIS\1212_Chevron_Padre_SLOTF\005_Hydrology_Study\ArcMapDocuments\Catchment Map.mxd, 05/27/08



LEGEND

- PROPERTY BOUNDARY
- STORM WATER CATCHMENT A
- STORM WATER CATCHMENT B
- OFFSITE CATCHMENT
- CLOSED CATCHMENT

0 400 800 1,600 Feet

SCALE

STORM WATER
CATCHMENT AREAS

SAN LUIS OBISPO TANK FARM
SAN LUIS OBISPO, CALIFORNIA

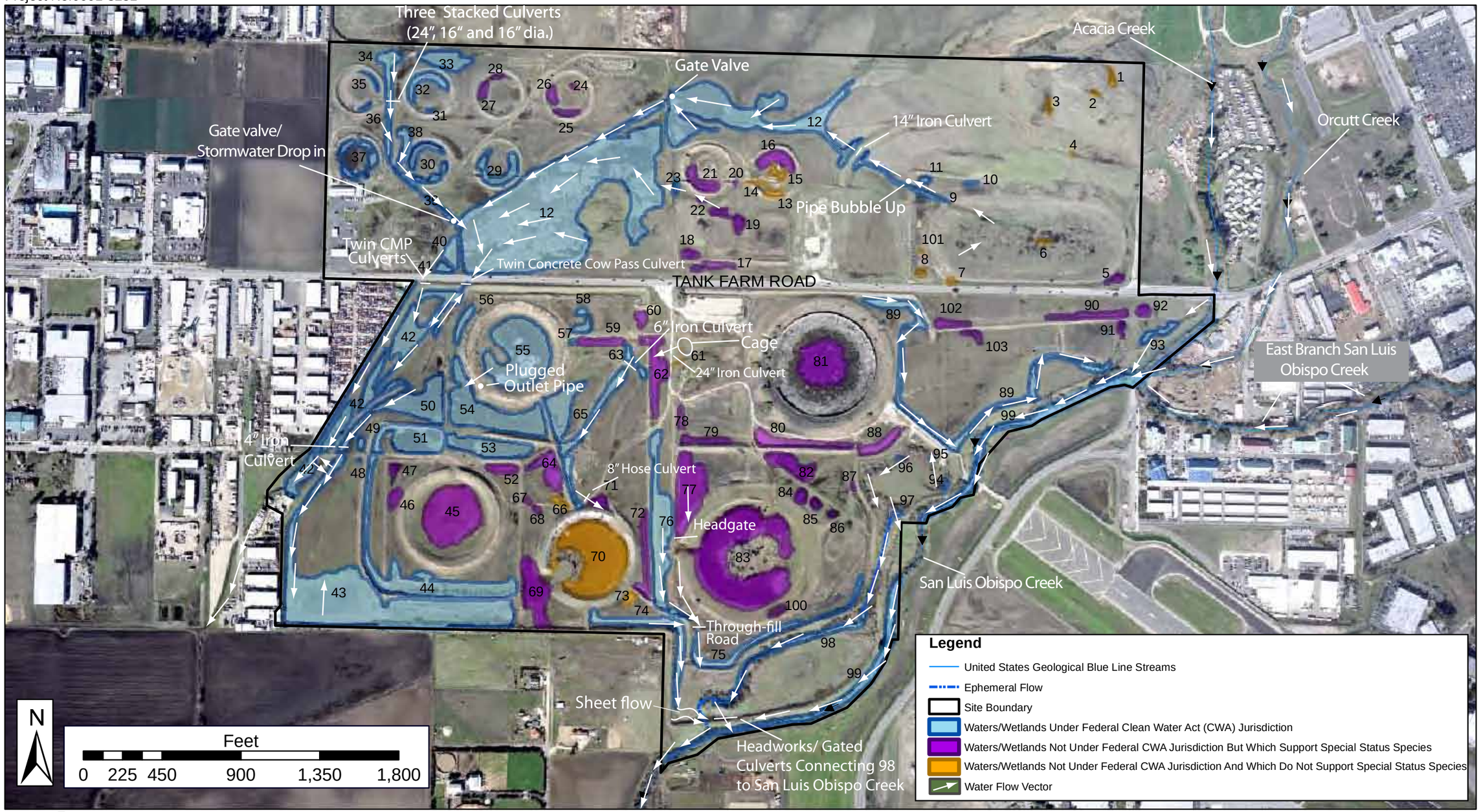
PREPARED FOR

CHEVRON CORPORATION
SAN LUIS OBISPO, CALIFORNIA

AVOCET ENVIRONMENTAL, INC.

STORMWATER CATCHMENT AREAS (AVOCET ENVIRONMENTAL 2007)
FIGURE - 8

July 2008
Project No.0601-3281



padre associates, inc. ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS
WSP

WATER FLOW DIRECTIONS AMONG WATERS/WETLANDS
CHEVRON TANK FARM, SAN LUIS OBISPO, CA
FIGURE - 9

Chevron EMC – San Luis Obispo Tank Farm Restoration and Re-development Project

N

0 150 300 600 900 Meters

0 500 1,000 2,000 3,000 Feet

Soil Map Unit Descriptions
221 = Xererts-Xerolls-Urban land complex, 0 to 15 percent slopes
197 = Salinas silty clay loam, 0 to 2 percent slopes
169 = Marimel sandy clay loam, occasionally flooded
144 = Gazos - Lodo clay loams, 30 to 50 percent slopes
127 = Cropley clay, 0 to 2 percent slopes
120 = Concepcion loam, 2 to 5 percent slopes

MAPPED SOILS FOR THE SLO TANK FARM PROJECT SITE (NRCS 2004)
FIGURE - 10

PHOTOGRAPHS

Photograph 1. SLO Tank Farm project site is primarily open space. This photo looks southwest across wetland feature #83 (Reservoir 3) toward a line of trees along the East Fork of San Luis Obispo Creek.

Photograph 2. SLO Tank Farm project site looking eastward along the northern edge of the North Marsh. Cattle graze throughout the majority of the property.

Photograph 3. Much of the SLO Tank Farm project site is dominated by non-native forbs and grasses.

Photograph 4. Oxbow located in the south eastern portion of the site is dominated by scrub/shrub and forested plant communities.

Photograph 5. The East Fork of San Luis Obispo Creek is dominated by scrub-shrub or forest communities along part of the reach within the SLO Tank Farm project site.

Photograph 6. Depressional wetland (#37) in old tank footprint. Non-native dominants including cocklebur (*Xanthium strumarium*) are in the foreground.

Photograph 7. North Marsh/ Tank Farm Creek slope/ riverine wetland complex at the SLO Tank Farm project site.

Photograph 8. Depressional wetland features such as those in foreground persist as a result of the SLO Tank Farm project site's long history of ranching and industrial development.

Photograph 9. The highest elevations on the SLO Tank Farm project site are in the northeastern portion. The slope grades generally southward and onto valley alluvium.

Photograph 10. Tank Farm Road bisects the SLO Tank Farm project site. Two sets of culverts convey water southward.

Photograph 11. The old crude oil reservoirs were lined with various materials, and berms were installed around their perimeters to contain oil if necessary.

Photograph 12. Berms that show the legacy of soil and hydrologic disturbance are present throughout the SLO Tank Farm project site. Many of these berms are remnants of historic reservoirs.

Photograph 13. Cattle graze across the majority of the SLO Tank Farm project site. Note ponding in foreground.

Photograph 14. East Fork of San Luis Obispo Creek at the SLO Tank Farm. Native California walnuts (*Juglans californica* var. *california*) are not infrequent along the adjacent riparian corridor.

Photograph 15. East Fork of San Luis Obispo Creek at the SLO Tank Farm. View looking north.

Photograph 16. Old water control structure in Tank Farm Creek, upgradient of the North Marsh at the SLO Tank Farm project site.

Photograph 17. Tank Farm Creek in winter 2007 at the SLO Tank Farm project site.

Photograph 18. North Marsh at SLO Tank Farm project site (April 2008). Note dominance by native rushes (*Juncus* spp.) and bulrush (*Schoenoplectus* spp.).

Photograph 19. Twin concrete culverts under Tank Farm Road.

Photograph 20. Headworks at south end of wetland #98 infrequently connect the southern extent of the SLO Tank Farm site with the East Fork of San Luis Obispo Creek.

Photograph 21. Ponding was observed in Reservoir 6 (Wetland #45) in January 2008.

Appendix A
Correspondence between EDAW and NRCS (1999)

USDA NRCS
Natural Resources Conservation Service

United States
Department of
Agriculture

Natural Resources
Conservation
Service

65 Main St., Suite 108
Templeton, Ca. 93465
(805) 434-0396
(805) 434-0284 (FAX)

September 10, 1999

Gary Jakobs
EDAW, Inc.
2022 J Street
Sacramento, CA 95814

Subject: Verification of Jurisdictional Delineation of Wetlands at the Unocal Tank Farm, San Luis Obispo County, California

Dear Mr. Jakobs,

Enclosed please find a copy of the verification letter for the Wetland Delineation performed by EDAW, Inc. I have enclosed a copy of the data sheet for the point NRCS-A that describes the delineation Debra Bishop, Tiffany Welch, Steve Patterson and I made, as well.

Thank you for the opportunity, I look forward to working with your company again.

Respectfully,

Cheryl Zelus

Cheryl Zelus
Soil Conservationist

Enclosures

cc: R. Hanscom
K. Smith

The Natural Resources Conservation Service,
formerly the Soil Conservation Service,
is an agency of the
United States Department of Agriculture

AN EQUAL OPPORTUNITY EMPLOYER

USDA NRCS
Natural Resources Conservation Service

United States
Department of
Agriculture

Natural Resources
Conservation
Service

65 Main St., Suite 108
Templeton, Ca. 93465
(805) 434-0396
(805) 434-0284 (FAX)

September 10, 1999

Steve Patterson
EDAW, Inc.
2022 J Street
Sacramento, CA 95814

Subject: Verification of Jurisdictional Delineation of Wetlands at the Unocal Tank Farm, San Luis Obispo County, California

Dear Mr. Patterson,

I verify that the delineation of jurisdictional waters of the United States made by EDAW, Inc. is accurate and meets the definitions prescribed in the 1987 U. S. Army Corps of Engineers Wetlands Delineation Manual and the Federal Register, section 33 CFR Part 328.3, dated Thursday, November 13, 1986. This delineation is included in the "Wetland Delineation for UNOCAL Tank Farm, San Luis Obispo, California" (July 29, 1999), and on the map "Wetlands and Other Waters, Subject to Jurisdiction of the U.S. Army Corps of Engineers, Union Oil Company of California, Tank Farm Site, San Luis Obispo, California". Please include this verification letter with your application to U.S. Army Corps of Engineers for a permit under the Clean Water Act, Section 404.

I further verify that the delineation known as NRCS-A, delineated by Tiffany Welch, U. S. Army Corps of Engineers, Debra Bishop and Steve Patterson, EDAW, Inc. and myself on August 25, 1999, as marked on the August 1999 version of the above mentioned map, which I received September 3, 1999. I have included a copy of the data sheet for the delineation we made in the field.

I visited the UNOCAL Tank Farm Property on August 25, 1999, with Tiffany Welch, Debra Bishop and Steve Patterson, and again on August 26, 1999, with Debra Bishop and Steve Patterson.

The U.S. Army Corps of Engineers has the authority to review, comment and approve any delineation of "Other Waters" made or verified by the Natural Resources Conservation Service (NRCS) according to Section IV C of the "Memorandum of Agreement Among EPA, USDA, USDI and DOD Concerning the Delineation of Wetlands".

Over the next 30 days you may request a reconsideration of this wetland verification from my office. If the Natural Resources Conservation Service (NRCS) does not receive a request for reconsideration within 30 days, NRCS will certify this wetland delineation. Please call me if you have any questions or need an explanation of this determination.

Respectfully,

Cheryl Zelus

Cheryl Zelus
Soil Conservationist
Natural Resources Conservation Service
Templeton Service Center

Enclosures

CC: Tiffany Welch, U. S. Army Corps of Engineers,
Debra Bishop, Senior Restoration Ecologist
Gary Jakobs, AICP, Project Manager
Margy Lindquist, District Conservationist

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Unocal Tank Farm
Applicant/Owner:
Investigator: TW, DB, SP, CZ

Date: 8/25/99
County: SLO
State: CA

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? Yes (No)
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: NRCS A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. polypogon monspelliensis		FACW	9. juncus bufonius		FACW
2. Salix lasiolepis		FacW	10.		
3. Xanthium strumarium		Fact	11.		
4. eleocharis macrostachya		obl	12.		
5. Sonchus arvensis		FacUp	13.		
6. polygonum amphibium		obL	14.		
7. lolium multiflorum		up	15.		
8. lotus corniculatus		FAC	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-).

Remarks: >50%

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:
Primary Indicators:
✓ Inundated
✓ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
✓ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Hydrology based on position and large number & depth of rest points indicating inundation and saturation.

SOILS

Map Unit Name (Series and Phase): _____

Drainage Class: _____

Taxonomy (Subgroup): _____

Field Observations Confirm Mapped Type? Yes No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Matrix Colors (Munsell Moist)	Matrix Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ✓ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Assume soils were inundated from evidence of deep hoofprints, large cracking, crusting, oxidized root channels

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)
Wetland Hydrology Present? Yes No
Hydric Soils Present? Yes No

(Circle)
Is this Sampling Point Within a Wetland? Yes No

Remarks: Site had strong wetland characteristics of saturation inundation and plants. Soils were heavy clay and showed signs of saturation with hoofprints and cracking + crusting.

Approved by HQUSACE 2/92

NATURAL RESOURCES CONSERVATION SERVICE

NRCS-CPA-
5-95

REQUEST FOR CERTIFIED WETLAND DETERMINATION/DELINEATION

(use when the client requests a certified determination/delineation)

OWNER	AGENT - (OPERATOR)
Name: Unocal	Name: John Ljung
Address: 276 Tank Farm Road	Address: - Same -
P.O. Box 1069, San Luis Obispo, CA 93406	
Phone: 805-784-0637	Phone:

Are you a USDA program Participant? (If yes, AD-1026 should be on file.) ☐ Yes ☑ No

Have you previously received a wetland determination or delineation on this tract from the Natural Resources Conservation Service *(formerly Soil Conservation Service)* or the Corps of Engineers? ☑ Yes ☐ No

Location of property (description): 276 Tank Farm Road, San Luis Obispo

County: San Luis Obispo | State: CA

Farm No.: _____ Tract No.: _____ Acres in tract 350 ☑ Map or aerial photo with the tract/area outlin

PURPOSE OF REQUEST FOR DETERMINATION/DELINEATION *(Check one and explain)*

☐ Agricultural purpose(s): _____
(Such as: clearing for cropland, drainage, farm buildings, etc.)

☑ Non-Agricultural purpose(s): _____
(Such as: commercial development, subdivisions, etc.)

☐ Informational purpose(s): _____

- I certify that I am the owner or agent of the owner for the property previously described.
- I grant the Natural Resources Conservation Service *(or their designated agents)* the right to enter the property previously described to ascertain the extent of wetlands on said property.
- I understand that the information collected and the certified wetland determination/delineation is public information and may be release to the public or utilized in any of the agencies' data bases, or published on official wetland maps.

Signature of Owner:	Date:
Signature of Agent: *(As authorized by the owner)* JRLjung	Date: 8-24-99

J U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of The United States knowingly and willful falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than $10,0 or imprisoned not more than five years, or both.

EDAW

EDAW INC

2022 J STREET

SACRAMENTO CALIFORNIA

95814

TEL 916 414 5800

FAX 916 414 5850

www.edaw.com

July 28,1999

Ms. Tiffany Welch
U.S. Army Corps of Engineers
Los Angeles District
2151 Alessandro Drive, #100
Ventura, California 93001

Subject: **Jurisdiction Delineation of Waters of the U.S. for Unocal Tank Farm**

Dear Ms. Welch:

EDAW is pleased to submit the attached report summarizing our findings, pursuant to Section 404 of the Clean Water Act, of the U.S. Army Corps of Engineers (USACE) jurisdiction for the Unocal Tank Farm site. The Unocal Tank Farm is a 368-acre former oil storage site located in the unincorporated area of San Luis Obispo, California.

Our surveys found 57.2 acres subject to USACE jurisdiction on the Unocal Tank Farm, which consists of 55.8 acres of jurisdictional wetlands and 1.4 acres of Other Waters of the U.S.

We look forward to discussing this report with you at our August 5, 1999 scheduled verification meeting in San Luis Obispo. Please contact either of us if you have any questions regarding this report.

Sincerely,

Debra Bishop
Senior Restoration Ecologist

Gary Jakobs, AICP
Project Manager

cc: John Ljung
Russ Hanscom
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chron
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Appendix B
Arid West Manual Datasheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: SLO Tank Farm City/County: San Luis Obispo/SLO Sampling Date: 2/18/08
Applicant/Owner: Chevron EMC State: CA Sampling Point: #3
Investigator(s): Lyndon Lee, Jessica Peak Section, Township, Range: Sec 11, T31S, R12E
Landform (hillslope, terrace, etc.): ____ Local relief (concave, convex, none): ____ Slope (%): ____
Subregion (LRR): LRR C Lat: ____ Long: ____ Datum: ____
Soil Map Unit Name: ____ NWI classification: ____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation Y, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____
Hydric Soil Present?	Yes X	No ____
Wetland Hydrology Present?	Yes X ~~No~~ X	

Is the Sampled Area within a Wetland? Yes X No ____

Remarks:
- Type 3 waters
- Gravel, sand mining pit - perhaps excavated for watering domestic livestock

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
Total Cover: 0			
Sapling/Shrub Stratum			
1. N/A			
2.			
3.			
4.			
5.			
Total Cover: 0			
Herb Stratum			
1. Parapholis incurva	25	Y	FACW
2. Lotus corniculatus	15	Y	FAC
3. Brassica nigra	10	Y	UPL
4. Erodium circutarium	15	Y	UPL
5.			
6.			
7.			
8.			
Total Cover: 65			
Woody Vine Stratum			
1. N/A			
2.			
Total Cover: 0			

% Bare Ground in Herb Stratum 35% % 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: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	1	x 2 = 2
FAC species	1	x 3 = 3
FACU species		x 4 =
UPL species	2	x 5 = 10
Column Totals:	4 (A)	15 (B)

Prevalence Index = B/A = 3.75

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)
- X Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
- Veg. graded, disturbed by soil removal operations / gravel removal

Sampling Point: #3

SOIL

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 %	Type[1]	Loc[2]	Texture	Remarks
0-12"	10YR 3/2		10YR 5/6	few	C	RC	sandy clay loam	
>12"	10YR 3/2		10YR 5/6	few	C	RC	sandy clay loam mixed w/gravel & rock	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
- X 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.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1) (**Nonriverine**)
- X Sediment Deposits (B2) (**Nonriverine**)
- X 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 Plowed Soils (C6)
- ___ 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)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 36"

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

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

Wetland Hydrology Present? Yes X No ___

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

Remarks:

observed ponding >180 days

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: SLO Tank Farm City/County: San Luis Obispo/SLO Sampling Date: 2/18/08

Applicant/Owner: Chevron EMC State: CA Sampling Point: #4

Investigator(s): Lyndon Lee, Jessica Peak Section, Township, Range: Sec 11, T 31 S, R 12 E

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

Subregion (LRR): LRR C Lat: ____ Long: ____ Datum: ____

Soil Map Unit Name: ____ NWI classification: ____

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

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

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

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

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

Remarks:
- shallow depression

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
Total Cover: 0			
Sapling/Shrub Stratum			
1. N/A			
2.			
3.			
4.			
5.			
Total Cover: 0			
Herb Stratum			
1. Rumex crispus	15	Y	FACW
2. Parapholis incurva	20	Y	OBL
3. Eleocharis macrostachya	35	Y	OBL
4.			
5.			
6.			
7.			
8.			
Total Cover: 70%			
Woody Vine Stratum			
1. N/A			
2.			
Total Cover: 0			

% Bare Ground in Herb Stratum 30% % 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: 3 (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:

X 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.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
- veg. grazed by livestock

Sampling Point: #4

SOIL

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 %	Type[1]	Loc[2]	Texture	Remarks
0-9"	10YR 4/3		10YR 5/6	many	C	RC	silty clay loam	
>9"	10YR 5/6		—	—	—	—	sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X 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.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:
- hydric by virtue of ponding – Criteria 3
- highly disturbed by livestock
- upper horizon compacted by livestock

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1) (**Nonriverine**)
- X Sediment Deposits (B2) (**Nonriverine**)
- X 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 Plowed Soils (C6)
- ___ 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)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 6"

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

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

Wetland Hydrology Present? Yes X No ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: SLO Tank Farm City/County: San Luis Obispo/SLO Sampling Date: 2/18/08
Applicant/Owner: Chevron EMC State: CA Sampling Point: #15
Investigator(s): Lyndon Lee, Jessica Peak Section, Township, Range: Sec. 11, T 31 S, R 12 E
Landform (hillslope, terrace, etc.): ____ Local relief (concave, convex, none): ____ Slope (%): ____
Subregion (LRR): LRR C Lat: ____ Long: ____ Datum: ____
Soil Map Unit Name: ____ NWI classification: ____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation Y, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
- tank bottom

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
Total Cover: 0			
Sapling/Shrub Stratum			
1. N/A			
2.			
3.			
4.			
5.			
Total Cover: 0			
Herb Stratum			
1. Lotus corniculatus	15	Y	FAC
2. Cynodon dactylon	25	Y	FAC
3. Parapholis incurva	20	Y	OBL
4.			
5.			
6.			
7.			
8.			
Total Cover: 60%			
Woody Vine Stratum			
1. N/A			
2.			
Total Cover: 0			

% Bare Ground in Herb Stratum 40% % 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: 3 (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:
X 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.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
- veg grazed by livestock

Sampling Point: #15

SOIL

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 %	Type[1]	Loc[2]	Texture	Remarks
0-18"	10YR 4/2 - 10YR 4/4		10YR 5/6	few	C	RC	sandy clay loam - silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X 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.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:
- tank bottom, compacted by tank & livestock
- mixed urban fill

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1) (**Nonriverine**)
- X Sediment Deposits (B2) (**Nonriverine**)
- X 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)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ 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)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): ± 6" max

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

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

Wetland Hydrology Present? Yes X No ___

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

Remarks:
- observed ponding > 18.5 days.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: SLO Tank Farm City/County: San Luis Obispo/SLO Sampling Date: 2/18/08
Applicant/Owner: Chevron EMC State: CA Sampling Point: #24
Investigator(s): Lyndon Lee, Jessica Peak Section, Township, Range: Sec 11, T 31 S, R 12 E
Landform (hillslope, terrace, etc.): ____ Local relief (concave, convex, none): ____ Slope (%): ____
Subregion (LRR): LRR C Lat: ____ Long: ____ Datum: ____
Soil Map Unit Name: ____ NWI classification: ____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation Y, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____
Hydric Soil Present?	Yes X	No ____
Wetland Hydrology Present?	Yes X	No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks:
- tank bottom

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum			
1. N/A			
2.			
3.			
4.			
5.			
Total Cover:	0		
Herb Stratum			
1. Paraphilis incurva	20	Y	OBL
2. Lotus corniculatus	15	Y	FAC
3. Eleocharis macrostachya	30	Y	OBL
4.			
5.			
6.			
7.			
8.			
Total Cover:	65%		
Woody Vine Stratum			
1. N/A			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 35% % 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: 3 (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:
X 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.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
- veg. grazed by livestock

Sampling Point: #24

SOIL

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 %	Type[1]	Loc[2]	Texture	Remarks
0-18"	10YR 4/2 - 10YR 5/4		10YR 5/6	common	C	RC	silty clay loam - sandy clay loam	w/some gravel & asbestos chunks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X 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.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:
- tank bottom, urban fill - highly mixed & compacted
- ponding for long duration

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- X Sediment Deposits (B2) (**Nonriverine**)
- X 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)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ 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)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 6-8"

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

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

Wetland Hydrology Present? Yes X No ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: SLO Tank Farm City/County: San Luis Obispo/SLO Sampling Date: 2/18/08
Applicant/Owner: Chevron EMC State: CA Sampling Point: #31
Investigator(s): Lyndon Lee, Jessica Peak Section, Township, Range: Sec. 11, T31S, R12E
Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Slope (%):
Subregion (LRR): LRR C Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation Y, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
- isolated depression

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
Total Cover: 0			
Sapling/Shrub Stratum			
1. N/A			
2.			
3.			
4.			
5.			
Total Cover: 0			
Herb Stratum			
1. Rumex crispus	10	Y	FACW
2. Lotus corniculatus	15	Y	FAC
3. Eleocharis macrostachya	20	Y	OBL
4.			
5.			
6.			
7.			
8.			
Total Cover: 60%			
Woody Vine Stratum			
1. N/A			
2.			
Total Cover: 0			

% Bare Ground in Herb Stratum 40% % 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: 3 (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:
X 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.

Hydrophytic Vegetation Present? Yes X No

Remarks:
- veg. grazed by livestock

Sampling Point: #31

SOIL

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 %	Type[1]	Loc[2]	Texture	Remarks
0-18"	Gley 1 5/N - (some 10YR 4/3)		10YR 5/6	few	C	RC	sandy clay loam - silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X 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.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:
- mixed urban fill in tank bottom - compacted by tank & Livestock

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1) (**Nonriverine**)
- X Sediment Deposits (B2) (**Nonriverine**)
- X 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)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ 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)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 6" max depth

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

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

Wetland Hydrology Present? Yes X No ___

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

Remarks:
- observed ponding for >18-8 days

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: SLO Tank Farm City/County: San Luis Obispo/SLO Co. Sampling Date: 2/18/08
Applicant/Owner: Chevron EMC State: CA Sampling Point: #85
Investigator(s): Lyndon Lee, Jessica Peak Section, Township, Range: Sec. 11, T 31 S, R 12 E
Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Slope (%):
Subregion (LRR): LRR C Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation Yes, Soil Yes, or Hydrology Yes significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: one of 3 small depressions

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
Total Cover: 0			
Sapling/Shrub Stratum			
1. N/A			
2.			
3.			
4.			
5.			
Total Cover: 0			
Herb Stratum			
1. Rumex crispus	15	Y	FACW
2. Lotus corniculatus	15	Y	FAC
3. Eleocharis macrostachya	40	Y	OBL
4.			
5.			
6.			
7.			
8.			
Total Cover: 70%			
Woody Vine Stratum			
1. N/A			
2.			
Total Cover: 0			

% Bare Ground in Herb Stratum 30% % 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: 3 (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:

X 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.

Hydrophytic Vegetation Present? Yes X No

Remarks:
- veg grazed by livestock.

Sampling Point: #85

SOIL

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 %	Type[1]	Loc[2]	Texture	Remarks
0-9"	10YR 3/2		10YR 4/4	common	C	RC	silty clay loam	
9-18"	10YR 3/2		10YR 5/4	common	C	RC	silty clay loam	
>18"	10YR 3/3		10YR 5/6	many	C	RC	silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X 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.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:
- ponded 4-6"; saturated to surface

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- X 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)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 4-6"

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

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

Wetland Hydrology Present? Yes X No ___

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

Remarks:
- observed ponding for >18.5 days
- compaction of soil by livestock

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: SLO Tank Farm City/County: San Luis Obispo / SLO Sampling Date: 2/18/08
Applicant/Owner: Chevron EMC State: CA Sampling Point: #86
Investigator(s): Lyndon Lee, Jessica Peale Section, Township, Range: Sec 11, T31S, R12E
Landform (hillslope, terrace, etc.): ____ Local relief (concave, convex, none): ____ Slope (%): ____
Subregion (LRR): LRR C Lat: ____ Long: ____ Datum: ____
Soil Map Unit Name: ____ NWI classification: ____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation Yes, Soil Yes, or Hydrology Yes significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: one of 2 small depressions

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
Total Cover: 0			
Sapling/Shrub Stratum			
1. N/A			
2.			
3.			
4.			
5.			
Total Cover: 0			
Herb Stratum			
1. Rumex crispus	10	Y	FACW
2. Eleocharis macrostachya	45	Y	OBL
3. Centromadia fitchii ssp. congdonii	15	Y	FAC
4.			
5.			
6.			
7.			
8.			
Total Cover: 70%			
Woody Vine Stratum			
1. N/A			
2.			
Total Cover: 0			

% Bare Ground in Herb Stratum 30% % 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: 3 (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:
X 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.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
- veg. grazed by livestock.

Sampling Point: #86

SOIL

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 %	Type[1]	Loc[2]	Texture	Remarks
0-4"	10YR 2/2		10YR 5/4	common	C	RC	silty clay loam	
>4"	10YR 5/4		none/dry		—	—	silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
- X 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.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:
- upper horizon w/many oil/tar granules
- ponded in areas, saturated @ surface
- at 4" hard textural transition, fill or import in lower horizon; lower horizon dry

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- X Sediment Deposits (B2) (**Nonriverine**)
- X 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)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ 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)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 4"

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

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

Wetland Hydrology Present? Yes X No ___

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

Remarks:
- observed ponding >18.5 days

Appendix C
Resumes of Principal Scientists

Brian G. Dugas

Project Manager/Biologist

EDUCATION: B.S., Natural Resources Management, College of Agriculture, California Polytechnic State University, San Luis Obispo, 1993

Continued education towards M.S., Specialization: Gen. Agriculture, Emphasis: Fisheries & Wildlife Management, College of Agriculture, Food, and Environmental Sciences, California Polytechnic State University, San Luis Obispo, 2002-2007

CERTIFICATIONS: California Division of Occupational Safety and Health Administration (OSHA), 40-Hour Hazardous Waste Operations Safety Training.

Cal OSHA, Annual Hazardous Materials/Waste Site Worker 8-Hour Refresher

EXPERIENCE: Mr. Dugas joined Padre Associates in 1998 and has been involved with all aspects of Padre's Environmental Science and Planning Group. Mr. Dugas has 13 years of experience in the environmental field; 11 as an environmental specialist with emphasis on biological resources impact analysis and 2 as a water quality technician. His experience includes land use planning involving preparation of environmental documents consisting of mitigated negative declarations (MND), initial studies, environmental assessments, monitoring reports, technical reports and environmental impact reports (EIR) with emphasis on biological resources. Typical job responsibilities include preliminary site and environmental impact assessment, development of site-specific mitigation strategies, multi-agency interaction and permit facilitation. Representative projects include; Conejo Valley Reservoir MND, Sacramento Central Delta/Phase Two Natural Gas Exploration Seismic Survey MND, Southern California Edison Mandalay Marine Terminal Decommissioning Project MND, Avila Beach Community Services District Marine Outfall Repair and Extension Project MND, and Plains Exploration & Production Phase IV Expansion Project EIR.

Regulatory Permitting His experience includes environmental impact assessment and permitting for a variety of projects including abandonment of offshore marine terminals and associated onshore pipeline corridors within San Luis Obispo, Santa Barbara and Ventura Counties. Permitting efforts include consultation with the State Lands Commission, California Coastal Commission (Coastal Development Permit), Army Corps of Engineers (404 Permit), Regional Water Quality Control Board (401 Permit), and California Department of Fish and Game (Streambed Alteration Agreement). Such permitting efforts have also included close coordination with other responsible agencies, including Air Quality Control Districts, National Marine Fisheries Service, and the U.S. Fish and Wildlife Service. Representative projects include the Chevron-Aera Flowline Removal Project, Unocal Cojo Marine Terminal Decommissioning Project, Shell Molino Flowline Removal Project, SCE Mandalay Marine Terminal Decommissioning Project, Texaco Hollister Ranch Pipeline Abandonment Project, Avila Beach Community Services District Marine Outfall Repair and Extension Project, Duke Energy Morro Bay Marine Terminal Decommissioning Project, and the Chevron Estero Bay Marine Terminal Decommissioning Project.

Biological Surveys

Mr. Dugas has also conducted multiple biological studies consisting of riparian habitat assessments, wetland delineations, oak tree surveys, rare plant surveys, rapid bioassessments, and special-status wildlife species surveys. Such activities have included the preparation of site-specific restoration plans and implementation and monitoring of numerous restoration projects of wetland, coastal dune, coastal scrub and desert scrub native plant habitats. Typical job responsibilities included site analysis, site preparation and the collection of site-specific plant and seed material. In addition, Mr. Dugas conducted exotic species eradication, planting and seeding of restoration areas, and annual performance criteria monitoring. Recent representative projects include a resource inventory for the City of Carpinteria Creeks Preservation Program, Unocal Point Conception Facilities Biological Assessment, Revegetation Plans for the Shell Molino East Slope and Nearshore Work Areas, Plains Exploration & Production Phase IV Expansion Project, Tank Farm Road Safety & Operational Improvements Project NES, and Wetland Assessment, and the River Road Bridge Replacement Project.

Biological Monitoring

Mr. Dugas has also provided mitigation monitoring services on numerous large-scale construction projects. Job responsibilities include daily monitoring and documentation of construction activities to ensure compliance with project specific conditions of approval, notifying project foreman or responsible individual of non-compliance issues and subsequent corrective measures and weekly reporting to regulatory agencies and local governmental bodies. Representative projects include the Unocal/Guadalupe Beach A2A Emergency Remediation Project, which involved daily monitoring of the project site for biologically sensitive species, such as the federally listed, threatened California red-legged frog and western snowy plover. Mr. Dugas participated as a biological monitor during the City of Thousand Oaks - Unit W & Unit F Sewer Interceptor Reconstruction Project. Job responsibilities included fish rescue and relocation of special-status reptiles during construction activities. Mr. Dugas also performed biological monitoring on behalf of the County of San Luis Obispo during the Chevron Rio-Bravo Pipeline Pigging Operation. Daily responsibilities included pre-activity surveys for San Joaquin kit fox dens and relocation of wildlife trapped within pipeline excavation areas. In summary, Mr. Dugas has conducted numerous protocol level and/or pre-construction surveys for the following species: Calif. red-legged frog, San Joaquin kit fox, arroyo toad, southwestern pond turtle, two-striped garter snake, Calif. tiger salamander, steelhead, tidewater goby, and western snowy plover.

SUPPLEMENTAL TRAINING:

San Luis Obispo County, San Joaquin Kit Fox Habitat Evaluation Workshop, 2006

AEP CEQA Workshop Series, San Luis Obispo, March 2005

Salmonid Restoration Federation and Urban Streams Conference, March 2003

Practical Streambank Restoration Workshop, NRCS, April 8, 2003

California Red-Legged Frog Workshop, Sacramento-Shasta Chapter of the Wildlife Society, Presented by: Norman J. Scott and Galen B. Rathbun, April 8-10, 2002

California Fish Passage Workshop, Consortium of Governmental Agencies, 2001

AFFILIATIONS

Morro Coast Audubon Society

Central Coast Biological Society

padre associates, inc.
ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

Resume

Jessica K. Peak

Staff Biologist

EDUCATION: B.S. Botany and Environmental Biology, Humboldt State University, 2003

CERTIFICATIONS/ WORKSHOPS: California Division Occupational Safety and Health Administration (OSHA), 40-Hour Hazardous Waste Operations and Emergency Response Safety Training

Army Corps of Engineers Wetland Delineation & Management Training Program

Alameda County Conservation Partnership Contra Costa Water District, Los Vaqueros Reservoir & Watershed Workshop on Biology and Management of the California red-legged frog

EXPERIENCE: Ms. Peak joined Padre Associates, Inc. in August 2006. As a Staff Biologist, she has been involved in many aspects of the Environmental Sciences and Planning Group. Ms Peak has over 5 years of field experience conducting biological surveys and environmental assessments. Ms. Peak's job responsibilities include biological resources surveys, development of site-specific mitigation strategies, biological and construction monitoring activities such as pre-construction biological surveys, pre-construction worker environmental training sessions, restoration and mitigation monitoring, multi-agency interaction, and permit facilitation. Associated with these tasks she has prepared biological and botanical resources assessments, constraints analyses, mitigation monitoring reports, site-specific mitigation and restoration plans, construction monitoring plans, and has been involved in preparation of environmental impact reports (EIR) with emphasis on biological resources..

BIOLOGICAL STUDIES: Ms. Peak has conducted numerous botanical and biological resources surveys such as special-status/rare plant surveys, special-status wildlife surveys, vegetation mapping, habitat assessments, oak tree surveys, and routine wetland delineations. Activities include site analysis, preparation and implementation of restoration projects for native plant habitats and rare plant species, site preparation and seed collection, permit facilitation, and success criteria monitoring. Recent representative projects include Chevron EMC San Luis Obispo Tank Farm Remediation and Redevelopment Project, Morro Bay Marina Renovation Project, Plains Exploration and Production Produced Water Reclamation Facility Project, San Luis Obispo County Women's Jail Expansion Project, Roadhouse Development Bank Stabilization Project, Nipomo Community Services District Waterline Intertie Project, Chevron EMC Cojo/Point Conception Decommissioning Project, and the Oak Creek Estates Development Project.

BIOLOGICAL & CONSTRUCTION MONITORING: Ms. Peak has also conducted environmental monitoring for multiple development projects. Typical job responsibilities include daily monitoring and documentation of construction activities to ensure compliance with project specifications and conditions of approval, interaction with job foreman to remedy any non-compliance issues, and weekly reporting to regulatory agencies and local government departments. Recent representative projects include Edna Valley

padre associates, inc.
ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

Resume

Estates Development Project, Valle Vista Development Project, Oak Shores Estates Development Project, and Exxon/Mobil Venadito Canyon Storm Damage Repair Project.

PRIOR WORK EXPERIENCE:

Prior to joining Padre Associates, Ms. Peak served as the associate botanist for LBJ Enterprises in Eureka, California from September 2004 to August 2006. There she conducted various botanical and biological surveys in and around Humboldt, Mendocino, and Trinity Counties. Typical job responsibilities included rare and endangered plant surveys, ethnobotanical surveys, routine wetland delineations, and terrestrial mollusk surveys.

Ms. Peak served as field botanist during the 2004 field season for the Lake Tahoe Urban Biodiversity Project in South Lake Tahoe, California conducting botanical surveys in and around the Lake Tahoe Basin. Typical duties included performing line-intercept surveys, percent cover analyses, and evaluation of forest physiognomy. She also served as a restoration crew intern for the California Tahoe Conservancy in South Lake Tahoe in the fall of 1999. Her duties on the restoration crew included soil erosion control, stream environment zones and watershed restoration, re-vegetation, and restoration of public and recreational areas.

In addition to field experience Ms. Peak worked as a greenhouse assistant at the Humboldt State Biological Sciences Greenhouse in 2002 and 2003. Duties included care and preservation of a large variety of plant species from around the world and overall general maintenance of the greenhouse.

Ms. Peak has also participated in international field studies, completing a Tropical Ethnobotany course at the Institute for Tropical Ecology and Conservation, Bocas del Toro, Panama, in 2005.

PROFESSIONAL AFFLIATIONS:

California Native Plant Society
California Society for Ecological Restoration
California Native Grasslands Association

WSP Environment & Energy
2324 Eastlake Avenue East, Suite 505
Seattle, WA 98102

Tel: 206.284.7402
Email: lyndon.lee@wspgroup.com
http://www.wspenvironmental.com

Lyndon C. Lee, Ph.D., PWS

Principal Ecologist & Vice President
Ecosystem Science & Natural Resources Management Services

Professional Experience

Lyndon C. Lee is Principal Ecologist/Vice President with WSP Environment & Energy (WSP). In his current capacity, Lyndon co-leads the Ecosystem Science & Natural Resources Management group (ESNRM) for WSP. ESNRM includes several senior scientists who have a great deal of applied national and international experience. ESNRM specializes in wetland and river science, conservation biology, design/build approaches to ecosystem restoration, regulatory assistance, and training. In addition to waters/wetlands, ESNRM focuses its operations in many different types of ecosystems including forests, grasslands, riparian areas, urban landscapes, brownfields, and other contaminated sites.

Prior to joining WSP (February, 2007), Lyndon worked as the Senior Ecosystem Ecologist for Entrix, Inc. (2006) and as Principal Ecologist & Vice President for BBL/Arcadis (2005-2006). During the period 1989 – 2004, he served as Principal Ecologist and President of L.C. Lee & Associates, Inc. (LCLA) and Director of the National Wetland Science Training Cooperative. LCLA was a small environmental consulting firm that specialized in river and wetland science, regulatory assistance, and training throughout the U.S.

From 1986 to 1989, Lyndon served as the Senior Wetland Ecologist for the U.S. Environmental Protection Agency (EPA) Headquarters Office of Wetlands Protection, Washington, D.C. During this time, he was involved directly with the formulation and application of national waters/wetlands policy, applied research, and regulatory/enforcement procedures. At EPA, Dr. Lee directed a national team of EPA technical and regulatory experts who dealt with top priority waters/wetland issues throughout the U.S. He also served as the liaison from the Office of Wetlands Protection to the EPA Superfund and RCRA programs. During his tenure at EPA,

Dr. Lyndon C. Lee came to WSP after working in wetland, river, and forested ecosystems, soil science, and wildlife ecology for 30 years. Currently, his interests are focused on responses of wetland, river, and forested ecosystems to perturbation; assessment of site-specific and cumulative impacts to waters/wetland ecosystem functions; design and construction of waters/wetlands ecosystem restorations; and management of the movement and fate of contaminants in waters/wetlands ecosystems.

Education

- Ph.D. - Ecosystem Ecology with a focus on River & Wetland Science, 1983, University of Washington
- M.S. - Forest Ecology/Silviculture, 1979, University of Montana
- B.S. - Forest Ecology/Botany, 1974, Tufts University and the University of Montana

Registrations

- Society of Wetland Scientists - Professional Wetland Scientist (#000385 - Since 1995)
- Certified Sediment And Erosion Control Lead
- Certified Hazwoper

Lyndon led the team that produced a landmark study of cumulative impacts to bottomland hardwood forests of the southeastern U.S. He also founded the National Wetland Science Training Cooperative, which he has continued to run since leaving EPA.

Lyndon came to EPA from the University of Georgia Institute of Ecology, Savannah River Ecology Laboratory (SREL), Aiken, South Carolina. During the interval 1984 – 1986, he was the Research Manager of the SREL Division of Wetlands Ecology where he managed SREL's wetland research programs at the U.S. Department of Energy's Savannah River Nuclear Facility and National Environmental Research Park. Savannah River is a principal production site for weapons-grade plutonium and many other radionuclides. SREL's research focused on (a) assessment and monitoring of the effects of radionuclide production on riverine wetland ecosystems, (b) management of the movement and fate of radionuclide, heavy metal and organic contaminants in waters/wetlands, and (c) restoration of wetland and river ecosystems degraded by chronic thermal and/or contaminant inputs.

While pursuing his graduate degrees, Lyndon spent six years researching the structure and functioning of riverine waters/wetlands and riparian forested ecosystems throughout the Pacific Northwest and Northern Rocky Mountain regions. He focused on interactions among physical and geochemical processes and development of the structure and functioning of floodplain and riparian plant communities. Between his Master's and Ph.D. programs, (1977 – 1980) he worked as one of two Senior Habitat Ecologists for the Interagency Grizzly Team's Border Grizzly Project, Montana Forest and Range Conservation Experiment Station, Missoula, Montana. There he developed, conducted, and supervised research dealing with the definition, description, classification, protection, and restoration of grizzly bear and grey wolf habitat throughout the northern Rocky Mountains, southeastern British Columbia, and in northern Chihuahua, Mexico. Lyndon placed particular emphasis on waters/wetlands ecosystems as essential components of critical habitat for endangered bears and other wide-ranging carnivores.

The scope of Lyndon's consulting experience over the last 18 years has taken him to all areas of the U.S., Canada, Europe, Japan, and many Pacific and Caribbean islands. He has completed more than 125 contracts with federal, state, and local government agencies, private industry, research and conservation organizations, and private landowners. Dr. Lee has focused most of his efforts on the (a) application of science to the design and construction of large and small wetland and river restoration projects, and the (b) development and implementation of practical silvicultural and land-use management programs for wetlands and riverine ecosystems. Currently Lyndon's technical and applied interests are focused on responses of wetland, river, and forested ecosystems to perturbation, assessment of site-specific and cumulative impacts to waters/wetland ecosystems, design and construction of waters/wetlands ecosystem restorations, and management of the movement and fate of contaminants in waters/wetlands ecosystems.

In addition to his technical and applied work, Lyndon continues to work as a national expert on the federal Clean Water Act jurisdictional and functional assessment issues as they relate to management of waters/wetlands. In this capacity, his emphasis always has been on the application of science to federal, state, and local programs that focus on protection of aquatic ecosystems. He has a great deal of experience in U.S. federal regulatory and enforcement procedures, assessment of impacts to waters/wetlands ecosystems, and training of others in all of

the above. For example, since 1993, Lyndon has been one of the principal architects responsible for development and implementation of the “Hydrogeomorphic Approach” (HGM) for assessment of waters/wetlands ecosystem functions. In this regard, he has extensive practical knowledge of ecological modelling, and application of science to regulatory, enforcement, and restoration programs. Further, since 1989, Lyndon has served as a lead expert and technical team leader for the National Resources Conservation Service, and the U.S. Department of Justice (DOJ) - Environment and Natural Resources Division. Working with DOJ, Lee has helped win or settle eight major Clean Water Act cases that have been argued in three Districts of U.S. federal court, two circuit courts of appeal, and the U.S. Supreme Court.

Lyndon has been active in teaching and training throughout his career. He held the position of Assistant Research Professor at the University of Georgia's Institute of Ecology while working at the Savannah River Ecology Laboratory and at EPA Headquarters. He has also served as an Adjunct Assistant Professor at both the University of South Carolina and George Mason University. While at the universities of Washington and Montana, Dr. Lee taught or assisted in teaching a variety of forestry and natural resource management courses. He also served as a principal instructor for the Montana Forest Habitat Type Short Courses, sponsored by the U.S. Forest Service Rocky Mountain Forest and Range Experiment Station. Since 1987, Dr. Lee has led over 100 training courses for EPA and several other federal, state, and local agencies and organizations through the National Wetland Science Training Cooperative.

Lyndon is an active member of the scientific community. He has published two books, more than 30 refereed professional papers, and over 150 technical reports. He has presented more than 50 oral papers and seminars at professional meetings and conferences. He edited the *Bulletin* and served on the National Board of Directors of the Society of Wetland Scientists (SWS) for seven years. Lyndon co-founded the “SWS Student Awards Program” and endowment, and served as the Program Chairman for two national SWS meetings (Seattle, 1987 and Washington, D.C., 1988). In 1992, Dr. Lee was awarded Life Membership in the Society of Wetland Scientists. In 1995, he earned certification as a Professional Wetlands Scientist (#385). In addition to SWS, Lyndon is member of standing in the Society For Ecological Restoration (SER) and American Association for the Advancement of Science (AAAS).

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Peggy L. Fiedler, Ph.D., PWS

Principal Botanist/Conservation Ecologist & Co-Director, Ecosystem Science & Natural Resources Management Services

Professional Experience

Peggy L. Fiedler, Ph.D. is Principal Botanist/Conservation Biologist and Co-Director of the Ecosystem Science & Natural Resources Management Services Group (ESNRM). Dr. Fiedler is recognized internationally as an expert in conservation science, rare plant biology and on the genus *Calochortus* (Liliaceae). Her primary research has focused on the demography, evolution, and systematics of *Calochortus*, in particular, and the biology and phylogeny of its rare species. She has coauthored treatments of this genus for the *Jepson Manual: Higher Plants of California* (Hickman 1993), the *Flora of North America* (2002), and the second edition of the *Jepson Manual* (in press). More recently, Dr. Fiedler has spent the last two decades researching the population biology and life history characteristics of a variety rare wetland plants in the San Francisco Bay and Golden Gate Estuary.

In addition to her rare plant expertise, Dr. Fiedler is a recognized expert in California wetlands science. Under the auspices of the USEPA, Dr. Fiedler, along with two collaborators in California, developed a methodology for the classification and description of wetlands in the coastal watersheds of central and southern California. This work represents the first comprehensive inventory of wetlands in a discrete biogeographic province of the state, and serves as a model for wetland ecologists interested in documenting and protecting the rich wetland heritage of California. Under a second USEPA grant, Dr. Fiedler extended this methodology in draft form to seasonal (vernal) waters/wetlands ecosystems in the state. With her students from San Francisco State University (and subsequently), Dr. Fiedler has spent over 15 years researching Mason's lilaeopsis (*Lilaeopsis masonii* [Apiaceae]), a rare plant endemic to the Sacramento-San Joaquin Delta and Golden Gate Estuary ecosystems. In the early 1990s, she authored a plant identification book on common wetland plants for the Great Valley, published by the U.S. Army Corps of Engineers (USACE), Sacramento District.

Dr. Peggy L. Fiedler came to WSP after working in plant ecology and systematics and wetlands science for over 25 years. Her primary research has focused on the demography, evolution, and systematics of Calochortus, in particular, and the biology and phylogeny of its rare species. Her current interests are focused on understanding landscape level processes that generate and maintain species richness in mega diverse floras and applying this knowledge to the design of plant community types for ecosystem restoration, applying population viability models and metapopulation theory to the reintroduction of rare plant species, understanding demographic patterns of rare plants, including hybrid taxa, and improving monitoring protocols for ecosystem restoration.

Education

B.A., *cum laude*, 1976, Harvard University, Social Anthropology (Ethnobotany) (departmental honors *magna cum laude*)

M.S., 1980, University of California, Berkeley, Wildland Resource Science (Plant Ecology)

Ph.D., 1985, University of California, Berkeley Wildland Resource Science (Plant Evolutionary Ecology)

Registrations

- Professional Wetland Scientist, Registration #016371

Prior to joining WSP Environment & Energy, Dr. Fiedler served as principal scientist at Entrix, Inc. (2006-2007), BBL (2004-2006), and at L.C. Lee & Associates, Inc. (LCLA), a small private consulting firm that specialized in waters/wetlands ecosystem restoration, regulatory assistance, and training. While at LCLA, she managed the design and permitting of several large, high-profile waters/wetlands restoration projects in the San Francisco Bay Area. The majority of the projects involved the restoration of riverine wetlands and associated riparian ecosystems. All projects included restoring habitat for endangered species (e.g., California red-legged frog, San Francisco garter snake, California tiger salamander, and steelhead). She was also engaged as a botanical consultant on a ecosystem restoration projects in the Pacific Northwest (including Alaska) and the New England States. Additional responsibilities at LCLA included providing expert testimony, development of monitoring/adaptive management plans, client liaison, project development, and staff management.

Between 1987 and 2000, Dr. Fiedler served on the faculty of the Biology Department as a conservation biologist and plant evolutionary ecologist. She taught undergraduate and graduate courses in conservation biology as well as courses in general biology, plant ecology, systematic biology, organic evolution, ethnobotany, and population modeling. Dr. Fiedler also directed the graduate program in conservation biology, the first masters' degree program of its kind in the nation. Dr. Fiedler resigned as full professor in fall 2000.

In 1998, Dr. Fiedler received a Fulbright Senior Scholar Fellowship for collaborative research at Kings Park and Botanic Garden in Perth, Western Australia (now the Botanic Garden and Parks Authority). She spent six months in Western Australia working on the genus *Anigozanthos* (Haemodoraceae) as a model for understanding the demographic behavior of interspecific hybridization. Prior to her Fulbright fellowship, Dr. Fiedler traveled to Perth in 1985 as a guest speaker at the Fifth International Botanic Gardens Conservation Congress, and in 1983, to Trondheim, Norway, to speak at the United Nations/Norway Conference on Biodiversity. She has lectured nationally at a wide variety of venues as an invited speaker; for example, the Center for Plant Conservation conferences on rare plants (St. Louis [1993], Chicago [1999]), Ecological Society of America Symposium on Rare/Common Species (Knoxville [1994]), Institute of Ecosystem Studies Cary Conference (Millbrook [1995]), California Academy of Sciences Fellows Day (San Francisco [1989]), and at a variety of universities, including Stanford, University of California, Berkeley, and Colorado State University.

Dr. Fiedler is an active member of the conservation scientific community. She has published more than 50 journal articles, book chapters, taxonomic treatments, and technical reports. She has also edited two volumes on conservation biology published by Chapman & Hall, New York (1992. *Conservation Biology. The Theory and Practice of Nature Conservation, Preservation, and Management.* [with S.K. Jain] and *Conservation Biology. For the Coming Decade*. [1998, with P.M. Kareiva]). Dr. Fiedler also wrote a popular science book entitled *Rare Lilies of California*, illustrated by C. Watters and published by the California Native Plant Society (1996). She served as President of the California Botanical Society from 1993-94, and as a board member from 1987-88 and 1995-97. Dr. Fiedler also served on the editorial board for the international journal *Biological Conservation* from 1992 - 1998 (Associate Editor 1992-95). Currently she is Associate Editor for book reviews for the Society of Conservation Biology's journal, *Conservation Biology*, a position she has held since 2000. In 1992, Dr. Fiedler was inducted as a Fellow of the California Academy of Sciences. In 1995, she received the Larry Heckard Fellowship at the Jepson Herbarium at the University of California Berkeley and was a nominee for the Pew Fellowship in Conservation and the Environment in 1995.

Appendix D

Coordinate Location of Waters/Wetlands Under Federal Jurisdiction

Federal Wetland No.	Area (sq ft)	Acreage	Latitude	Longitude
9	12905.14	0.30	1207994.63149	646805.214794
10	1006.30	0.02	1208412.63159	646781.846674
11	2369.63	0.05	1208151.41645	646799.332055
12	711264.34	16.33	1206327.54818	646778.252617
23	1812.63	0.04	1206730.57558	646754.074389
29	19353.66	0.44	1205720.73787	646854.947623
30	19067.82	0.44	1205309.13205	646898.488807
31	544.45	0.01	1205328.66325	647193.269558
32	14678.79	0.34	1205304.02449	647354.429156
33	23303.66	0.53	1205421.11213	647482.027836
34	27677.49	0.64	1205025.13761	647506.941267
34	27677.49	0.64	1205076.61912	647220.475129
34	27677.49	0.64	1205073.99888	647068.752609
34	27677.49	0.64	1205093.00729	647304.712878
35	2205.22	0.05	1205003.84771	647362.461219
36	1277.49	0.03	1204958.60999	647214.747563
37	13947.09	0.32	1204932.19620	646946.337995
37	3572.29	0.08	1204853.00525	646849.909093
38	9062.77	0.21	1205177.36353	647008.968041
38	9062.77	0.21	1205168.73611	647098.048338
38	9062.77	0.21	1205207.43895	647077.831229
39	9713.70	0.22	1205297.08388	646710.460701
40	11784.24	0.27	1205453.31757	646384.303112
41	5441.54	0.12	1205400.46991	646297.127362
42	130288.55	2.99	1205027.66877	645669.658513
43	301243.23	6.92	1205012.39641	644418.447710
44	102378.78	2.35	1205322.50418	644551.757478
48	169.21	0.00	1204924.19122	645199.243735
49	2921.55	0.07	1204933.28581	645293.577671
50	66162.96	1.52	1205207.65971	645502.605707
51	52783.50	1.21	1205225.39619	645318.752034
53	42486.19	0.98	1205660.52668	645272.350923
54	94332.54	2.17	1205670.58493	645477.896106
55	113030.24	2.59	1205833.20230	645808.729053
56	9450.32	0.22	1205516.24594	645984.254966
57	625.67	0.01	1206137.43773	645875.122313
58	9216.31	0.21	1206198.80858	645986.439719
63	7331.19	0.17	1206493.75481	645756.209030
65	71527.66	1.64	1206155.77444	645428.618450
74	38157.77	0.88	1206600.70816	644182.348030
75	32785.36	0.75	1207208.81814	644182.548508
76	79598.34	1.83	1206641.04072	644801.646160
89	79056.73	1.81	1208381.38023	645695.842412
93	8996.99	0.21	1209484.92288	645930.334271
94	1003.76	0.02	1208269.72035	645041.538818
95	67.55	0.00	1208190.41700	645207.418391
96	294.04	0.01	1207997.46303	645212.141675
97	1840.63	0.04	1207990.08516	644890.508626
98	27927.43	0.64	1207386.70887	644111.499335
99	138545.86	1.72	1208296.68253	644753.109753