PRELIMINARY DELINEATION OF WETLANDS AND OTHER WATER BODIES

FOR THE

CENTRAL VALLEY NATURAL GAS STORAGE PROJECT, COLUSA COUNTY

SPK-2008-1588

January 2010

ICF INTERNATIONAL

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Tables and Figures

Acronyms and Abbreviations

Arid West Supplement	Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0
Central Valley	Central Valley Gas Storage, L.L.C.
CFR	Code of Federal Regulations
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
FIRM	Flood Insurance Rate Maps
GPS	global positioning system
NWR	National Wildlife Refuge
OHWM	ordinary high water mark
PG&E	Pacific Gas & Electric
USGS	U.S. Geological Survey
WRP	Natural Resources Conservation Service Wetlands Reserve Program

Preliminary Delineation of Wetlands and Other Water Bodies for the Central Valley Natural Gas Storage Project, Colusa County (SPK-2008-1588)

Summary

This report presents the results of a delineation of wetlands and other water bodies conducted for the Central Valley Natural Gas Storage Project, Colusa County. The delineation was conducted to assist Central Valley Gas Storage, L.L.C., in determining the type and extent of wetlands and other water bodies in the delineation area that may be waters of the United States and subject to regulation by the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act (CWA).

Wetlands and other water bodies were delineated using the routine onsite determination method described in the U.S. Army Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and, where applicable, the criteria specified in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 (Arid West Supplement) (U.S. Army Corps of Engineers 2008). Additionally, in evaluating the potential jurisdictional status of cultivated rice fields, the team used the guidance presented in Sacramento District Regulatory Branch memorandum 2007-01 (Irrigated Wetlands). The delineation of wetlands and other water bodies was based primarily on a review of soil survey information, current aerial photographs, field data gathered on a variety of seasonal dates, and previously verified wetland delineation reports prepared for two projects that occur within and adjacent to the delineation area (SPK-2001-00383 and SPK-2006-00897). Data were gathered during a number of field visits conducted in January, March, June, and July of 2009.

The delineation area encompasses 1,034.44acres and includes all areas that could be directly or indirectly disturbed during construction and maintenance of the project, as well as adjacent areas within 200 to 250 feet that could provide habitat for federally listed species (e.g., giant garter snake and fairy shrimp species). This delineation area was determined based on guidance received from Mr. Brian Vierria on November 6, 2008. The delineation area includes areas that would be directly and indirectly impacted by the proposed project: a compressor station and adjacent remote well pad site, observation well pads, meter station, approximate 14 mile pipeline alignment, staging areas, and new access roads.

Based on the data gathered during the field visits, a review of previously verified wetland delineations, and aerial photograph interpretation of areas that were not accessible during the field visits, the delineation area contains 156.173 acres of wetlands and other water bodies. Wetland types include wetland drainage, seasonal wetland, freshwater marsh, and rice fields that would pond for a duration and frequency to support wetlands under natural conditions (these rice fields occur only in the soil map unit Willows silty clay, 0 to 1 percent slopes, frequently flooded [map symbol 104]).

As described in this delineation report, the construction of levees and upstream dams has significantly modified the frequency and duration of flooding in the delineation area, particularly the natural flooding that was historically caused by the Sacramento River. Additionally, construction of

ditches has lowered the water table. These changes have resulted in some of the soils that formed under hydric conditions to no longer be subject to long duration flooding or saturation caused by a shallow water table (Reed 2006, Soil Survey Staff 2009). Under current conditions, some of the rice fields that occur in the delineation area would not flood or pond for a long duration. Based on this premise, and the guidance provided in the Irrigated Wetlands (2007-01) memorandum, many of the rice fields in the delineation area were not delineated as wetland features.

The other water bodies include non-wetland drainages, ditches, and canals that ultimately drain into the Sacramento River. The combined acreage of wetlands and other waters is shown in Table 1.

Table 1. Acreage Summary of Wetlands and Other Water Bodies

Feature	Acreage
Wetland Drainage (WD)	15.265
Seasonal Wetland (SW)	0.381
Freshwater Marsh (FWM)	5.602
Rice Field Wetland (RFW)	113.032
Other Waters Drainage (OWD)	21.893
Total	**156.173**

A description of the wetland and other water body features mapped in the delineation area is provided in the *Results* section of this report, and their locations are depicted in the 1" = 400' aerial photographs contained in Exhibit A. All jurisdictional boundaries presented in Exhibit A are preliminary and subject to verification by the Corps Sacramento District.

Introduction

This report presents the results of the delineation of wetlands and other water bodies conducted by ICF International for the proposed Central Valley Natural Gas Storage Project in Colusa County, California (Figure 1). The project consists of several above-ground and below-ground project facilities that are required to convert the depleted Princeton Gas Field into a high-deliverability storage field. As part of this conversion, Central Valley Gas Storage, L.L.C. (Central Valley) will construct a facility that allows the storage of gas in the Princeton Gas Field and provides a connection to Pacific Gas & Electric's (PG&E's) Line 400/401 Transmission System.

The project applicant is Central Valley. The contact person for the project applicant is as follows:

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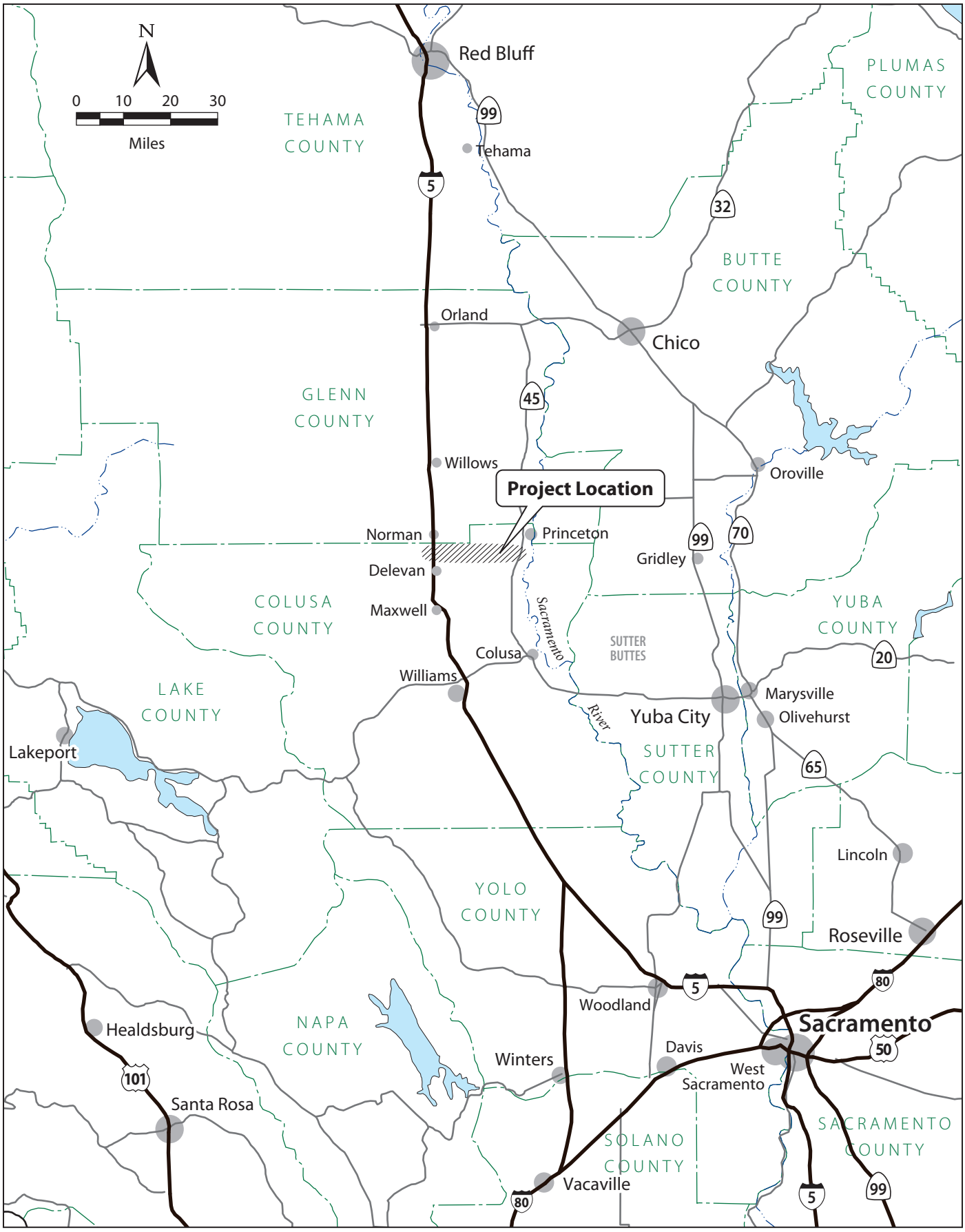

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Figure 1
Project Vicinity

Site Location and Driving Directions

The delineation area is located in northern Colusa County. The eastern end is located approximately two miles southwest of the town of Princeton. The western end is located approximately four miles west of the town of Delevan. The central portion of the delineation area occurs between the Sacramento National Wildlife Refuge (to the north) and the Delevan National Wildlife Refuge (to the south). Figure 2 shows the location of the delineation area and its relationship to the surrounding towns, highways, and national wildlife refuges.

The delineation area is located on the Princeton, Mouton Weir, Maxwell, and Sites U.S. Geological Survey (USGS) 7.5-minute quadrangles. The eastern end of the delineation area is at 39.3898 degrees north latitude and 122.03157 degrees west longitude and the western end is at 39.36552 degrees north latitude and 122.25941 degrees west longitude.

To reach the eastern end of the delineation area, from downtown Sacramento, go west on L Street and turn onto Interstate 5 northbound. After six miles, take state Highway 99/70 north exit. Proceed approximately 14 miles and take the left fork for Highway 99. Continue north on Highway 99 to Yuba City. At Yuba City, proceed west on state Highway 20. After crossing the Sacramento River, turn right on state Highway 45. Proceed north on Highway 45 and turn left onto Southam Road. Turn right on McAusland Road to find the proposed compressor station site near the northwestern corner of Southam and McAusland Roads.

Site Description

Topography

Elevations in the delineation area are approximately 70 feet at the eastern end and 160 feet at the western end. The lowest part of the delineation area is in the vicinity of the point where Willow Creek and the Colusa Drain together flow into the Colusa Trough, where the elevation is approximately 60 feet. This is also the area that contains the delineated rice field wetlands.

According to Reed (2006), nearly all of the fields used for rice production in Colusa County have been leveled over the last 20 to 25 years. The leveling helps to eliminate and straighten contour rice checks, thereby improving equipment efficiency and control of water depth during the growing season. Most fields are maintained by laser leveling every 4 or 5 years (Reed 2006). Based on review of aerial photographs, all of the rice fields in the delineation area are defined by a rectilinear arrangement of checks and levees (rather than contour checks), which confirms that all the rice fields have been laser leveled.

Geomorphology

Reed (2006) describes the geomorphic surface-soil-hydrologic relationships in the county. The following describes the primary geomorphic surfaces through which the delineation area passes, with an emphasis on the hydrologic characteristics associated with each surface.

High Floodplains. The eastern end of the delineation area (essentially the north-south oriented portion) straddles the toe of the high floodplain/natural levee of the Sacramento River. Before construction of the levees along the river, although elevated above the basins to the west, this surface was flooded in most years during periods of high river flow. It is now protected from

flooding by the levees. The soils are predominantly of the loamy Vina, Moonbend, and Scribner series.

Basins. The outboard toe of the high floodplain grades imperceptibly westward to merge with the basin soils of the Colusa Basin. The basin surface comprises the majority of the delineation area. Before construction of the Sacramento River levees, the Colusa Basin was subject to regular overflows from sloughs of the Sacramento River and streams flowing east from the Coast Range foothills. The floodwaters from the Sacramento River no longer reach the basin because of the levees, but the streams from the Coast Range foothills continue to reach the basin. Flooding is still frequent and of long duration along the lowest areas of the basin. Groundwater in the basins is shallower than that of the high floodplains. In general, the soils in the basin are predominantly of the clayey Willows and Clear Lake series, but in the delineation area a large body of Alcapay soils occurs on both sides of Interstate 5.

Alluvial Terraces. The western end of the delineation area extends onto the alluvial terrace geomorphic surface. The terrace is no longer subject to flooding. The soils are predominantly of the Hillgate series, which have a subsoil of brownish clay or clay loam. A shallow perched water table may occur in relatively small areas.

Hydrology

General. The delineation area is located in the Sacramento-Stone Corral hydrologic unit (HUC 18020104) (U.S. Geological Survey 2007).

The delineation area ultimately drains southerly through the Colusa Basin via various creeks, drains, and ditches into the Colusa Trough, which flows in a southerly direction into the Colusa Basin Drainage Canal (also called the Colusa Basin Drain and the Colusa Drain) southwest of the town of Grimes. The Colusa Basin Drainage Canal flows into the Sacramento River at the town of Knights Landing. However, when flows are high in the Sacramento River the Colusa Basin Drainage Canal discharges into the Knights Landing Ridge Cut (H.T. Harvey & Associates 2008).

The Colusa Trough begins at, and is fed by, the confluence of Willow Creek and the (channelized) Colusa Drain, which combine just upstream of the delineation area. Based on a review of the Compton Landing 1917 USGS topographic map, in the form of a defined channel the Colusa Trough appears to be an entirely artificial feature, at least for the part several miles south of the delineation area. However, an account from the 1890's describes a two-mile wide "trough" that probably received annual overflows from the Sacramento River and Coast Range streams (H.T. Harvey & Associates 2008).

The Sacramento River is located approximately 1.5 miles east of the eastern end of the delineation area and is a navigable water of the United States (U.S. Army Corps of Engineers 2009).

Irrigation water is applied to most of the rice fields in the county using a conventional flow through irrigation system, in which water is delivered from a canal into the top field of the overall field then flows through several fields to the bottom field. Levees and weir boxes placed at the ends of each levee control water flow rates and water depth in the individual fields (Reed 2006).

The rice fields are flooded up to a depth of approximately six inches in April and then usually aerially seeded. Until harvest time in September or October, the fields are maintained in a flooded condition. After being harvested in the fall, some of the rice fields are flooded again in the winter months to attract waterfowl and/or to decay rice stubble.

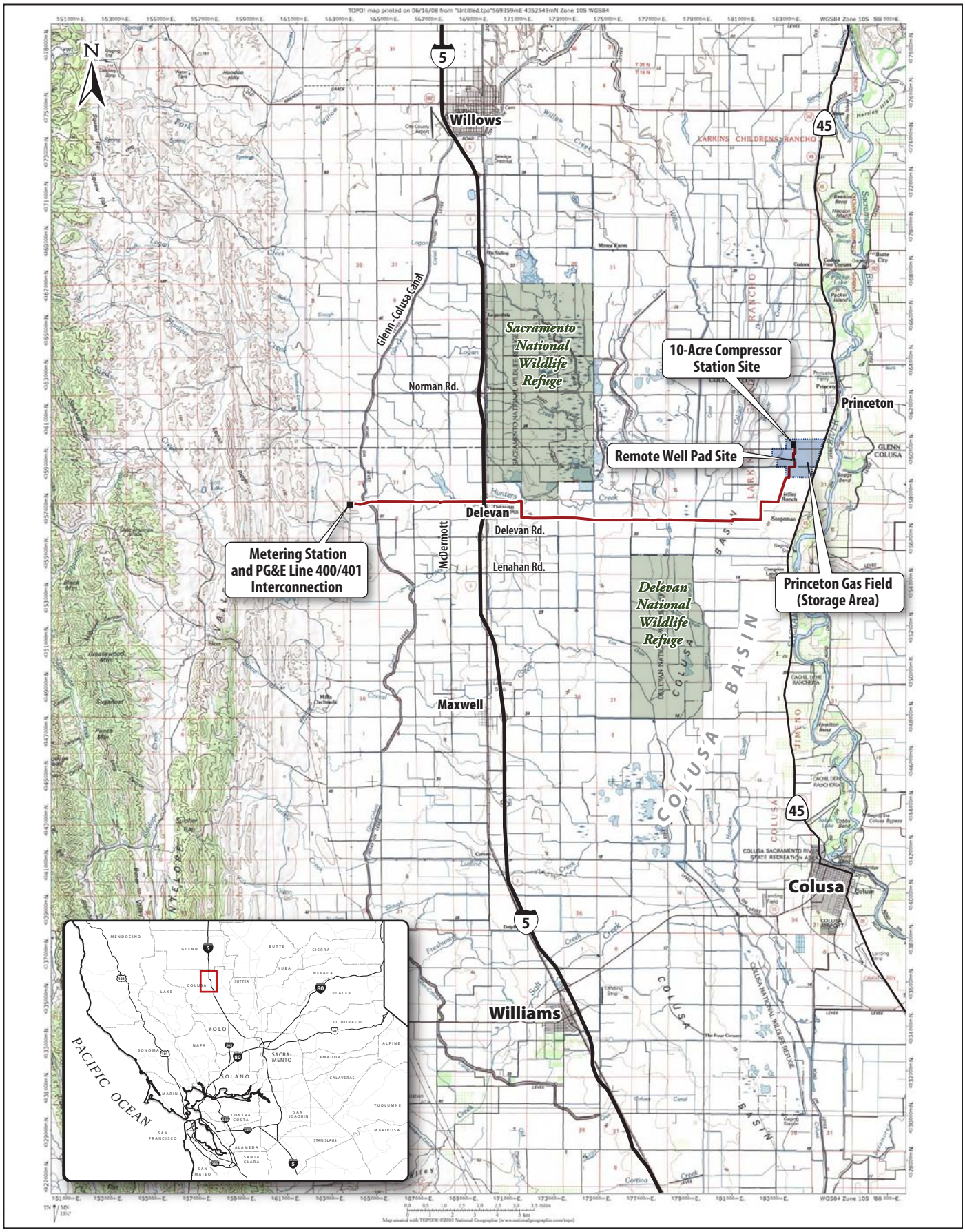

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Figure 2
Project Location

Flooding. Reed (2006) established the existing frequency and duration of flooding for all of the soil map units in the delineation area for existing conditions. Using standard Natural Resources Conservation Service definitions (Soil Survey Division Staff 1993), flooding frequency is expressed as frequent, occasional, rare, and none, as defined below.

- Frequent—flooding is likely to occur often under normal weather conditions (the chance of flooding is more than 50% in any year but is less than 50% in all months in any year)
- Occasional—occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50% in any year)
- Rare—flooding is unlikely but possible under unusual weather conditions (i.e., the chance of flooding is1 to 5% in any year)
- None—flooding is not probable (i.e., the chance of flooding is nearly 0%); flooding occurs less than 1 time in 500 years)

Flooding duration is expressed as follows:

- Extremely brief—0.1 hour to 4 hours
- Very brief—4 hours to 2 days
- Brief—2 to 7 days
- Long—7 to 30 days
- Very long—more than 30 days

Reed (2006) estimated the frequently flooded area of the Colusa Basin from aerial photographs of a small flood event on January 24, 1978. In such an event, water enters the basin from Willow Creek to the north and from numerous creeks to the west. The U.S. Army Corps of Engineers project levees now protect the Colusa Basin from frequent flooding from the Sacramento River. Flooding in the Colusa Basin begins when the flow at the Highway 20 gaging station on the Colusa Basin Drain exceeds 2,100 cubic feet per second. The flood on January 24, 1978 produced a reading of 4,020 cubic feet per second at the Highway 20 gaging station. This flood was of long duration.

Reed (2006) estimated the occasionally flooded area of the Colusa Basin from aerial photographs of larger flood events on March 4 and March 8, 1988. The events of March 4 and March 8 produced a reading of 5,720 cubic feet per second at the Highway 20 gaging station. Data from the California Department of Water Resources indicate that a flow of 5,720 cubic feet per second at Highway 20 occurs in about 20% of the years recorded (Reed 2006).

Reed (2006) estimated the rarely flooded areas of the basin areas in Colusa County using several methods. National Flood Insurance Program Flood Insurance Rate Maps (FIRM), based on a 1958 flood, were used for many areas. The high water lines from a large flood in February 1986 also were used. Some of this information was obtained from landowner interviews, elevation analysis, and soil morphologic characteristics. Data from the Colusa and Moulton Weirs taken since 1943, when Shasta Reservoir went into operation, indicate that both weirs flow on a frequent basis. Careful study of flow data at the Colusa and Moulton Weirs showed that the more elevated areas of the flood plain inside the Sacramento River levees are occasionally flooded for brief periods.

In accordance with the Sacramento District Regulatory Memorandum 2007-01 (*Irrigated Wetlands*), historic topographic maps, aerial photographs, and soil survey reports were reviewed to ascertain the natural (i.e., pre-European settlement) hydrologic and vegetative conditions in the delineation

area. As discussed above under *Geomorphology*, the results of the review indicate that parts of the delineation area were once subject to frequent flooding and high groundwater levels that supported wetlands. However, as a result of flood control and other improvements, the frequent flooding that historically supported the wetlands has been reduced to an occasional or rare frequency in some areas, persisting now only for a brief duration (see the Flooding section for definitions of the flooding frequency and duration classes). Because the criteria used by the Corps to define a soil that is currently subject to hydric conditions requires at least frequent flooding for a long duration, in the absence of irrigation, many parts of the delineation area would be no longer supported by wetland hydrology where flooding is the driving force behind the soils' hydrologic regime.

Groundwater. Water table levels associated with each of the soil map units as determined by Reed (2006) are provided in Table 2. The water table levels were estimated by Reed by direct observation at selected sites and on the depth range of redox features. The indicated levels are for the depth range of the upper limit of the water table during December through April.

Based on H.T. Harvey & Associates (2008), there appears to be only a small amount (i.e., 5 to 10 feet) of seasonal groundwater level variation for the part of the delineation area between the Colusa Basin Drain and the Sacramento River. This may be a result of the Sacramento River, which stands higher in elevation that the basin, providing seepage to the basin.

Based on the soil survey report (Reed 2006), drainage ditches have lowered water tables in many areas below the primary root zone of most herbaceous plant species. Accordingly, in the absence of irrigation, many parts of the delineation area would be no longer supported by wetland hydrology where a shallow water table is the driving force behind the soils' hydrologic regime.

Soils

A map of the soils in the delineation area and associated hydric soil information are provided in Appendix A. The landform and hydrologic characteristics of the soils are summarized in Table 2. Morphologically, the soils on the high floodplain/natural levee are very deep and loamy. The soils in the basins are very deep and clayey. Excess sodium in the basin soils has been largely leached from the root zone by application of irrigation water. The soils of the alluvial terraces are very deep and have loamy surface layers and a claypan.

As described above, construction of levees and upstream dams has significantly modified the frequency and duration of flooding in the delineation area, particularly the natural flooding that was historically caused by the Sacramento River. Additionally, construction of ditches has lowered the water table. These changes have resulted in some of the soils that formed under hydric conditions to no longer be subject to long duration flooding or to saturation caused by a shallow water table (Reed 2006, Soil Survey Staff 2009).

Precipitation and Growing Season

The climate in the delineation area is characterized by hot, dry summers and cool, moist winters. National Weather Service cooperative weather station number CA 1948 (Colusa 2 SSW) is the closest weather station to the delineation area, located approximately 16 miles to the south. Average annual precipitation at this weather station is 16.9 inches, with most falling as rain between the months of November and March (U.S. Department of Agriculture, Natural Resources Conservation Service 2007). Rainfall for the July 1, 2008–June 30, 2009 precipitation year was roughly 80% of the

Table 2. Summary of Geomorphic Surface and Hydrologic Characteristics of the Soils in the Delineation Area

Soil Map Symbol	Soil Map Unit Name	Geomorphic Surface	Natural Drainage Class	Permeability/ Saturated Hydraulic Conductivity (µm/sec) (slowest layer)	Existing Flooding Duration and Frequency*	Existing Seasonal High Water Table** (feet)	Hydric Status of Primary Component of Map Unit***	Altered Hydrologic Conditions
104	Willows silty clay, 0 to 1 percent slopes, frequently flooded	Basin floors	Poor	Very slow/ 0.01–0.42	Long and frequent	4.0–6.0	Hydric	Flood control structures on the Sacramento River have changed flooding frequency and duration and lowered water tables. Rice drainage ditches have lowered water tables. Willows soil in this map unit is frequently flooded for long duration.
105	Willows silty clay, 0 to 1 percent slopes, occasionally flooded	Basin floors	Poor	Very slow/ 0.01–0.42	Brief and occasional	4.0–6.0	Hydric	Flood control structures on the Sacramento River have changed flooding frequency and duration and have lowered water tables. Rice drainage ditches have lowered water tables. These soils formed under saturated conditions and frequent flooding.
106	Willows silty clay, 0 to 1 percent slopes	Basin floors	Poor	Very slow/ 0.01–0.42	Brief and rare	4.0–6.0	Hydric	Flood control structures on the Sacramento River have changed flooding frequency and duration and lowered water tables. Rice drainage ditches have lowered water tables. These soils formed under conditions of saturation and frequent flooding.
108	Scribner silt loam	Flood plains	Poor	Moderately slow/1.4–4.0	Brief and rare	1.5–3.0	Hydric	Flood control structures on the Sacramento River have changed flooding frequency and duration and lowered water tables. Rice drainage ditches have lowered water tables. Under natural conditions, these soils were saturated near the surface and were frequently flooded.
113	Westfan loam, sodic, 0 to 2 percent slopes	Alluvial fans	Moderately well	Moderately slow/1.4–4.0	Brief and rare	---	Non-hydric	---

Soil Map Symbol	Soil Map Unit Name	Geomorphic Surface	Natural Drainage Class	Permeability/ Saturated Hydraulic Conductivity (µm/sec) (slowest layer)	Existing Flooding Duration and Frequency*	Existing Seasonal High Water Table** (feet)	Hydric Status of Primary Component of Map Unit***	Altered Hydrologic Conditions
124	Moonbend silt loam, 0 to 2 percent slopes, occasionally flooded	Flood plains	Moderately well	Moderately slow/1.4–4.0	Brief and occasional	---	Non-hydric	Flood control structures on the Sacramento River have changed flooding frequency and duration.
125	Moonbend silt loam, 0 to 2 percent slopes	Flood plains	Moderately well	Moderately slow/1.4–4.0	Brief and occasional	---	Non-hydric	Flood control structures on the Sacramento River have changed flooding frequency and duration.
128	Mallard loam, 0 to 1 percent slopes	Fans	Somewhat poor	Slow/0.42–1.4	Brief and rare	3.0–5.0	Non-hydric	Water tables have been lowered by rice drainage ditches.
130	Corbiere silt loam, 0 to 1 percent slopes	Rims on basin floors	Somewhat poor	Slow/0.42–1.4	Brief and rare	2.0–4.0	Non-hydric	Flood control structures on the Sacramento River have changed flooding frequency and duration and have lowered water tables. Rice drainage ditches have lowered water tables. It is assumed that Corbiere soils were not saturated near the surface under natural conditions.
133	Corbiere silt loam, 0 to 2 percent slopes, occasionally flooded	Rims on basin floors	Somewhat poor	Slow/0.42–1.4	Long and occasional	2.0–4.0	Non-hydric	Flood control structures on the Sacramento River have changed flooding frequency and duration and have lowered water tables. Rice drainage ditches have lowered water tables. It is assumed that Corbiere soils were not saturated near the surface under natural conditions.
144	Hillgate clay loam, 0 to 2 percent slopes	Terraces	Well	Slow/0.42–1.0	None	---	Non-hydric	---
145	Hillgate loam, 0 to 2 percent slopes	Terraces	Well	Slow/0.42–1.4	None	---	Non-hydric	---

Soil Map Symbol	Soil Map Unit Name	Geomorphic Surface	Natural Drainage Class	Permeability/ Saturated Hydraulic Conductivity (µm/sec) (slowest layer)	Existing Flooding Duration and Frequency*	Existing Seasonal High Water Table** (feet)	Hydric Status of Primary Component of Map Unit***	Altered Hydrologic Conditions
155	Alcapay clay, 0 to 1 percent slopes	Basin floors	Somewhat poor	Slow/0.42–1.4	Brief and rare	4.0–6.0	Non-hydric	Water tables have been lowered by rice drainage ditches.
171	Vina loam, 0 to 2 percent slopes	Flood plains	Well	Moderate/4.0–14.0	Brief and rare	---	Non-hydric	---
205	Capay clay, 0 to 3 percent slopes	Basin floors	Moderately well	Very slow/ 0.01–0.42	Brief and rare	>6.0	Non-hydric	---
220	Altamont silty clay, 5 to 9 percent slopes	Lower side slopes and north facing slopes of hills	Well	Slow/0.42–1.4	None	---	Non-hydric	---

Sources: Soil Survey Staff 2009, Reed 2006.

* See the Hydrology section for definitions of frequency and duration.

** Water table refers to a saturated zone in the soil from December through April (i.e., the time of year that the water table is highest). The figures represent the depth to the top (upper limit) of the saturated zone in most years. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence (namely, redoximorphic features), of a saturated zone in the soil. Where no data are provided (as indicated by "---"), a high water table is not a concern or data were not estimated. A saturated zone that lasts for less than a month is not considered a water table and therefore is not identified in the table.

*** "Primary Component" refers to the soil that makes up approximately 85% or more of the map unit. The remaining soils in the map unit (i.e., inclusions) are not indicated here. The inclusions may or may not be hydric. See Appendix A-2 for more detailed hydric soil information.

Notes: 1) The Natural Resources Conservation Service regards the hydric status of a soil as that under which the soil formed; a naturally hydric soil that has been effectively drained is still considered to be a hydric soil, even though it may now not be subject to prolonged inundation or saturation. 2) The likelihood for seasonal ponding (defined as standing water on soils in closed depressions that is removed only by percolation or evapotranspiration) to occur was also evaluated by Reed (2006) for each soil map unit. None of the map units in the delineation area are subject to ponding.

average in the region. However, a well above-average amount of rain had fallen in the two weeks preceding the site visit to the compressor station site on March 5, 2009.

The length of the growing season at the Colusa 2 SSW weather station in 5 years out of 10 at 28 degrees air temperature averages 343 days (U.S. Department of Agriculture, Natural Resources Conservation Service 2007).

Vegetation

The delineation area is within the Sacramento Valley geographic subdivision of the Great Central Valley in the California Floristic Province (Hickman 1993). The area was historically an open grassland community with interspersed vernal pools, seasonal wetlands, emergent wetlands, and intermittent and perennial creeks with riparian habitat and valley oak woodlands. Currently, the area supports very little natural habitat and has been substantially altered by agricultural activities.

Parts of the eastern and western parts of the delineation area are used for walnut production. The delineation area is predominantly used for rice, row crops, orchards, and other agricultural operations. Some of the agricultural fields (such as those on the 10-acre compressor station site) are rotated with rice, wheat, beans, and row crops. Large wetland systems are present north and south of the delineation area in the Sacramento and Delevan National Wildlife Refuges (NWRs).

A list of the plant species that were observed while conducting the delineation field surveys and their wetland indicator status is provided in Appendix B. The wetland plant communities found in the delineation area are described in the *Results* section of this report.

Delineation Methods

The fieldwork for the delineation was conducted by a soil scientist and botanist on January 15, March 5, June 25 and 26, and July 10 and 24, 2009. The team used the routine onsite determination method described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and, where applicable, the criteria specified in the Arid West Supplement (U.S. Army Corps of Engineers 2008). Additionally, in evaluating the potential jurisdictional status of rice fields, Sacramento District Regulatory Memorandum 2007-01 (*Irrigated Wetlands*) was referenced.

As detailed in the Arid West Supplement, data on vegetation, soil, and hydrology characteristics used as the basis for wetland boundary determinations were collected and recorded on Arid West Supplement data forms (version 2.0) where access was available at the time of the field surveys (Appendix C). Data forms were completed at 16 sample plots (data points).

In areas where the field investigators did not have access because of flooded field conditions or landowner restrictions, wetlands and other water bodies were mapped from the interpretation of aerial photographs; these features were viewed from adjacent areas wherever possible. The aerial photograph interpretation was based on known reference areas in which site access was available.

The plant indicator status of each species is based on the *National List of Plant Species that Occur in Wetlands: California* (Reed 1988). Common and scientific plant names are taken from the *Jepson Manual of Higher Plants of California* (Hickman 1993), supplemented by the Jepson Online Interchange for California Floristics (University of California 2007).

The boundaries of non-wetland water bodies (i.e., other waters drainages) were delineated at the ordinary high water mark (OHWM), as defined in Title 33, section 328.3 of the Code of Federal Regulations (CFR). The OHWM represents the limit of potential Corps jurisdiction over nontidal waters (e.g., irrigation ditches, canals, and natural streams) in the absence of adjacent wetlands (*33 CFR 328.04*). The features were mapped and delineated in the field in accordance with Corps Regulatory Guidance Letter No. 05-05 (U.S. Army Corps of Engineers 2005).

A Trimble GeoXT global positioning system (GPS) unit, typically accurate to less than one horizontal meter, was used to record the location of the data points and certain jurisdictional boundaries. However, where the boundaries of the wetland or water body were clearly evident on the 1 inch = 200 feet aerial photograph base map, the features were mapped directly into the aerial photograph. The GPS data were downloaded, differentially corrected, and superimposed onto recent color orthorectified aerial photographs and edited as necessary to generate the delineation maps.

Results

Table 3 provides the total acreage of wetlands and other water bodies delineated in the Central Valley Gas delineation area.

Table 3. Acreage Summary of Wetlands and Other Water Bodies

Feature	Status	Acreage
Wetland Drainage (WD)	Wetland	15.265
Seasonal Wetland (SW)	Wetland	0.381
Freshwater Marsh (FWM)	Wetland	5.602
Rice Field Wetland (RFW)	Wetland	113.032
Wetlands Subtotal		***134.280***
Other Waters Drainage (OWD)	Other Waters	21.893
Other Water Bodies Subtotal		***21.893***
Total		**156.173**

Photographs of representative wetlands, other water bodies, and of the delineation area in general are provided in Appendix D. A list of drainages (wetland and other waters) that occur in the delineation area is provided in Appendix E.

Wetlands

Wetland Drainage

Wetland drainages totaling 15.265acres were mapped within the delineation area (Exhibit A). Wetland drainages consist of natural and artificial drainages, agricultural ditches, and agricultural canals that are more than 5% vegetated; most are at least 50% vegetated. Paired data points were taken at representative wetland drainages to confirm the presence of all three wetland indicators (hydrophytic vegetation, hydric soil, and wetland hydrology) used by the Corps to identify wetlands.

The wetland drainages are typically dominated by cattail (*Typha* sp.) (OBL) and common tule (*Scirpus acutus var. occidentalis*) (OBL). Common associate species are umbrella sedge (*Cyperus eragrostis*) (FACW), Bermuda grass (*Cynodon dactylon*) (FAC), and Dallis grass (*Paspalum dilatatum*) (FAC). Hydric soil was identified by the presence of the indicators Redox Dark Surface (F6) and Depleted Matrix (F3). Wetland hydrology was usually identified by the presence of Surface Water (A1), but the indicators High Water Table (A2), Saturation (A3), and Oxidized Rhizospheres along Living Roots (C3) were also present at some locations.

The wetland drainages have a well-defined bed and bank and have been excavated to depths of approximately three to six feet. They appear to be supported by one or more of the following: irrigation tailwater from rice fields, high groundwater, and runoff from rice fields when they are fallow. At least some of the drainages appear to be subject to periodic dredging, such that much or all of the vegetation is removed. All wetland drainages eventually flow into the Sacramento River.

Seasonal Wetland

Seasonal wetlands totaling 0.381 acre were mapped within the delineation area (Exhibit A). These features generally consist of natural, or only slightly disturbed, planar to depressional areas in the vicinity of Interstate 5 and the western end near the proposed metering station (west of the Glenn Colusa Canal). Paired data points were taken at representative seasonal wetlands to confirm the presence of all three wetland indicators (hydrophytic vegetation, hydric soil, and wetland hydrology) used by the Corps to identify wetlands.

Non-native annual grasslands in the western portion of the delineation area (west of the Glenn-Colusa Canal and south of the Delevan Compressor Station access road) are known to support seasonal wetlands. These wetlands have been characterized as seasonal wetlands rather than vernal pools because they are not closed basin systems and are not dominated by typical vernal pool plant species (as described below). Seasonal wetlands were also mapped in the roadside swales and ditches along the Interstate 5 corridor.

The seasonal wetlands east of the Glenn-Colusa Canal were delineated by URS Corporation as part of the PG&E Colusa Generating Station Project and verified by the Corps on August 10, 2007 (SPK-2006-00897). The area north of the Delevan Compressor Station access road contains mima-mound topography and supports a variety of seasonal wetland types (including vernal pools and seasonal swales).

The seasonal wetlands west of the Glenn-Colusa Canal are routinely disked for fire control and as of June 29, 2009, supported very little vegetation (as shown in the photographs below). The dominant species observed during the wetland delineation were Italian wildrye (*Lolium multiflorum*) (FAC) and Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*) (FAC*)*. Hydric soil was identified by the presence of the indicator Redox Dark Surface (F6). Wetland hydrology was usually identified by the presence of Oxidized Rhizospheres along Living Roots (C3). The seasonal wetlands appear to be supported by incidental precipitation and local runoff inputs.

Photo 1. View (looking south) of seasonal wetland along north side of PG&E access road showing disked condition.

Photo 2. View (looking east) of seasonal wetland along north side of PG&E access road showing disked condition.

Freshwater Marsh

Freshwater marsh habitat totaling 5.602acres was mapped in one general area within the delineation area (Exhibit A). This wetland area in a Natural Resources Conservation Service Wetlands Reserve Program (WRP) easement appears to be created or restored habitat. This area was not available for access and was evaluated only through aerial photograph review. The aerial photographs show apparent freshwater marsh vegetation on the north side of the delineation area and flooding on the south side. Based on the vegetation signature and flooding shown on the aerial photographs, it was assumed that all three wetland indicators (hydrophytic vegetation, hydric soil, and wetland hydrology) used by the Corps to identify wetlands are present.

Rice Field Wetland

Rice field wetlands totaling 113.032 acres were mapped only in the lowest part of the Colusa Basin (in the vicinity of the Colusa Drain) where, according to the soil survey report (Reed 2006), flooding occurs at a sufficient frequency and duration to give rise to wetland hydrology in the absence of irrigation water (this area is shown on Sheets 4, 5, and 6 in Exhibit A). Although some of the other rice fields are subject to flooding, it is not of sufficient duration or frequency to give rise to wetland hydrology in such areas, nor is the water table sufficiently shallow to cause saturation in the primary root zone (see Table 2.)

The rice field wetlands located in the vicinity of the Colusa Drain consist of large, laser-leveled areas that are bordered by low levees or rice checks. They are fully vegetated while rice is being produced and partly vegetated by volunteer species when fallow. Paired data points were taken in two of the rice field wetlands (which were accessible at the time of the field visits) to confirm the presence of all three wetland indicators (hydrophytic vegetation, hydric soil, and wetland hydrology) used by the Corps to identify wetlands.

Rice field wetlands consist of a near monoculture of cultivated rice (*Oryza sativa*) (OBL) when rice is being produced. Common associate species, typically occurring only along the edges of the rice fields where the water depth is slightly shallower, include annual bluegrass (*Poa annua*) (FACW). Hydric soil was identified by the presence of the indicator Redox Dark Surface (F6). Wetland hydrology was usually identified by the presence of Surface Water (A1).

Included in some rice field wetlands are small inclusions of freshwater marsh vegetation (primarily cattails). These areas occur at the downslope edge of an individual rice field along the rice check, where the standing water is deepest. Because the areas of freshwater marsh may change from year to year, depending on the management of a given rice field, they were not mapped separately from the rice field wetland.

The rice field wetlands appear to be supported by flood irrigation, incidental precipitation, and possibly by a shallow water table.

Other Waters

Other Waters Drainage

Several other water drainages were mapped in the delineation area, comprising approximately 21.893 acres, and would qualify as other waters (Exhibit A). These features mostly consist of

irrigation canals that are less than 5% vegetated. The remaining other waters drainages are drainage ditches.

The other waters drainages have been excavated to depths of approximately four to 10 feet. The other waters drainages appear to be supported by one or more of the following: irrigation water delivered directly to the feature, tailwater from rice fields, groundwater, and runoff from rice fields when they are fallow. Nearly all of the drainages appear to be subject to periodic dredging, such that much or all of the vegetation is removed. An exception to this is the Colusa Trough, which appears to be generally too deep to support rooted vegetation. All other waters drainages eventually flow into the Sacramento River.

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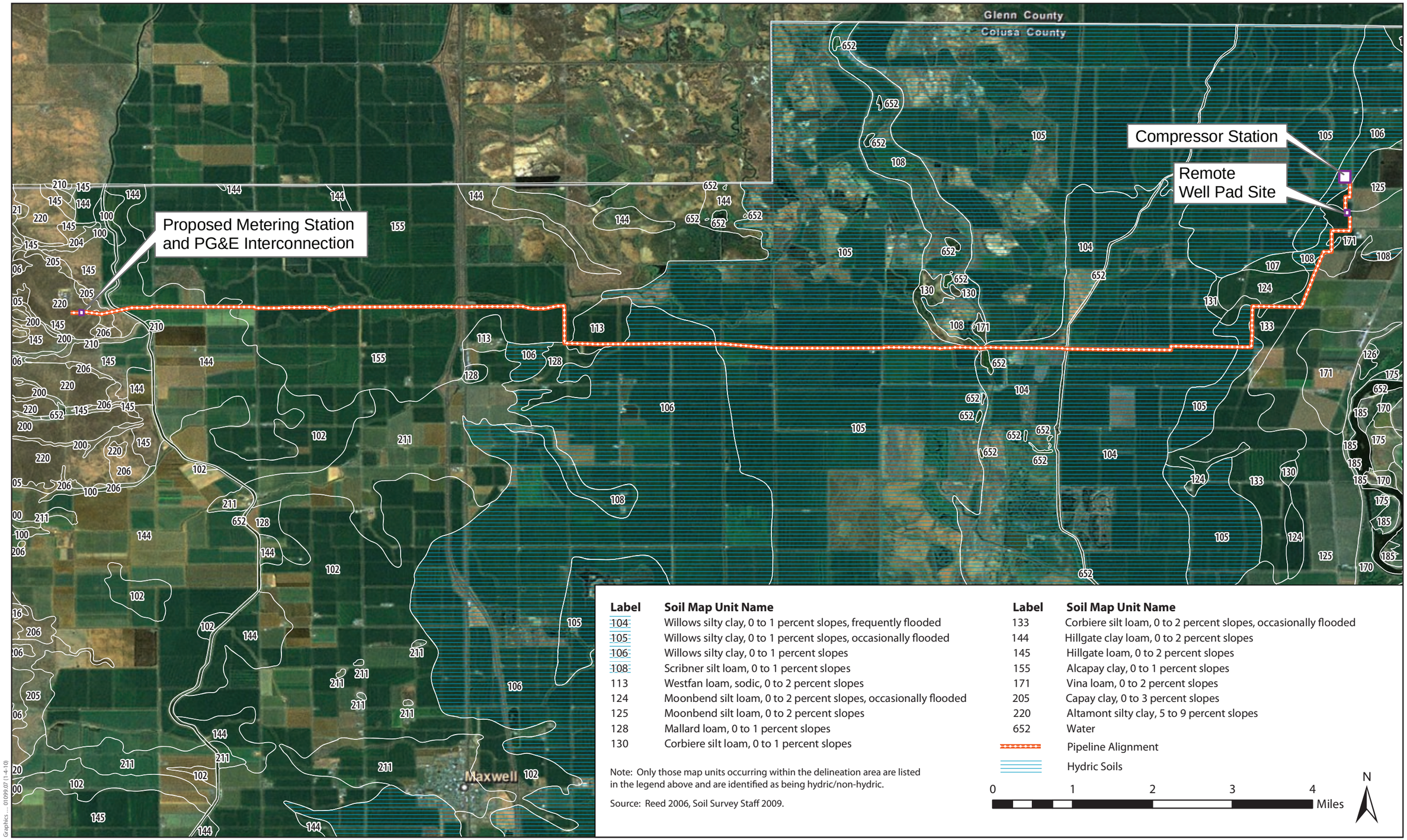
Appendix A

2006 Soil Survey Map



Label	Soil Map Unit Name
104	Willows silty clay, 0 to 1 percent slopes, frequently flooded
105	Willows silty clay, 0 to 1 percent slopes, occasionally flooded
106	Willows silty clay, 0 to 1 percent slopes
108	Scribner silt loam, 0 to 1 percent slopes
113	Westfan loam, sodic, 0 to 2 percent slopes
124	Moonbend silt loam, 0 to 2 percent slopes, occasionally flooded
125	Moonbend silt loam, 0 to 2 percent slopes
128	Mallard loam, 0 to 1 percent slopes
130	Corbiere silt loam, 0 to 1 percent slopes
133	Corbiere silt loam, 0 to 2 percent slopes, occasionally flooded
144	Hillgate clay loam, 0 to 2 percent slopes
145	Hillgate loam, 0 to 2 percent slopes
155	Alcapay clay, 0 to 1 percent slopes
171	Vina loam, 0 to 2 percent slopes
205	Capay clay, 0 to 3 percent slopes
220	Altamont silty clay, 5 to 9 percent slopes
652	Water
	Pipeline Alignment
	Hydric Soils

Note: Only those map units occurring within the delineation area are listed in the legend above and are identified as being hydric/non-hydric.

Source: Reed 2006, Soil Survey Staff 2009.

0 1 2 3 4 Miles

N

Graphics ... 01099.07 (1-4-10)

ICF Jones & Stokes
an ICF International Company

Appendix A
2006 Soil Survey Map

Appendix B

Plant Species Observed in the Delineation Area

The * following a scientific name indicates that the species is not native. Wetland indicator status follows Reed (1988); nomenclature follows Reed (1988) and *The Jepson Manual* (Hickman 1993) and online updates.

Scientific Name	Common Name	Wetland Indicator Status‡
Ferns and Fern-allies		
Azolla filiculoides	mosquito fern	OBL
Equisetum hyemale ssp. *affine*	rough horsetail	FACW
Trees		
Acer negundo	box elder	FACW
Eucalyptus camaldulensis *	river red gum	UPL
Eucalyptus globulus *	blue gum	UPL
Fraxinus latifolia	Oregon ash	FACW
Juglans californica var. *hindsii*	California black walnut	UPL
Populus fremontii ssp. *fremontii*	Fremont cottonwood	FACW
Quercus lobata	valley oak	FAC*
Salix gooddingii	black willow	OBL
Shrubs and Woody Vines		
Ficus carica *	edible fig	UPL
Rubus armeniacus [R. discolor] *	Himalayan blackberry	FACW*
Rubus ursinus [R. vitifolius]	California blackberry	FACW*
Salix lasiolepis	arroyo willow	FACW
Salix exigua	sandbar willow	OBL
Sambucus mexicana	blue elderberry	FAC
Toxicodendron diversilobum	poison-oak	UPL
Vitis vinifera *	cultivated grape	UPL
Forbs		
Abutilon theophrasti *	velvet-leaf	NI
Achyrachaena mollis	blow-wives	FAC*
Alisma lanceolatum *	lanceleaf water plantain	OBL
Alisma plantago-aquatica	water plantain	OBL
Amaranthus blitoides	prostrate pigweed	FACW
Amaranthus sp.	amaranth	UPL
Ambrosia psilostachya	western ragweed	FAC
Ammannia robusta	grand ammannia	OBL
Asclepias fascicularis	narrow-leaf milkweed	FAC
Aster subulatus var. *ligulatus*	annual water-aster	UPL
Bidens frondosa	stickweed	FACW
Brassica nigra *	black mustard	UPL
Brodiaea sp.	brodiaea	UPL
Centaurea solstitialis *	yellow star-thistle	UPL
Centromadia fitchii	Fitch's spikeweed	UPL
Ceratophyllum demersum	coontail, hornwort	OBL

Scientific Name	Common Name	Wetland Indicator Status‡
Chamaesyce maculata *	spotted spurge	UPL
Convolvulus arvensis *	field bindweed	UPL
Conyza canadensis	sneezeweed	FAC
Conyza floribunda *	tropical horseweed	UPL
Crassula aquatica/solieri	water pygmy-weed	OBL
Cressa truxillensis	alkali weed	FACW
Echinodorus berteroi	burhead	UPL
Eclipta prostrata	false daisy	UPL
Elodea canadensis	Canadian pondweed	OBL
Epilobium ciliatum ssp. *ciliatum*	hairy willowherb	FACW
Eremocarpus setigerus	turkey mullein	UPL
Erodium cicutarium *	redstem filaree	UPL
Eryngium castrense	coyote thistle	UPL
Euthamia occidentalis	western goldentop	OBL
Geranium dissectum *	cut-leaved geranium	UPL
Grindelia camporum	Great Valley gumplant	FACU
Hirschfeldia incana *	Mediterranean hoary mustard	UPL
Kickxia spuria *	flullein	UPL
Lactuca serriola *	prickly lettuce	FAC
Lemna minuta	minute duckweed	OBL
Lotus corniculatus *	birdfoot trefoil	FAC
Ludwigia peploides ssp. *montevidensis** *	floating water-primrose	OBL
Lythrum californicum	California loosestrife	OBL
Lythrum hyssopifolia *	hyssop loosestrife	FACW
Malva neglecta *	common mallow	UPL
Malvella leprosa	alkali mallow	FAC*
Medicago polymorpha *	bur-clover	UPL
Melilotus alba *	white sweetclover	FACU+
Nerium oleander *	oleander	UPL
Physalis lancifolia *	narrowleaf tomatillo	UPL
Picris echioides *	bristly ox-tongue	FAC*
Plagiobothrys stipitatus var. *micrantha*	Stipitate popcornflower	UPL
Plantago coronopus *	buckhorn plantain	FAC
Plantago lanceolata *	English plantain	FAC-
Polygonum arenastrum [P. aviculare] *	common knotweed	FAC
Polygonum lapathifolium	willow smartweed	OBL
Polygonum pensylvanicum *	willow smartweed	OBL
Polygonum punctatum	punctate smartweed	OBL
Potamogeton foliosus var. *foliosus*	leafy pondweed	OBL
Potamogeton nodosus	longleaf pondweed	OBL
Psilocarphus brevissimus	woolly marbles	OBL
Rumex crispus *	curly dock	FACW-

Scientific Name	Common Name	Wetland Indicator Status‡
Rumex pulcher *	fiddle dock	FAC+
Salsola tragus *	Russian thistle, tumbleweed	UPL
Senecio vulgaris *	common groundsel	NI*
Silybum marianum *	milk thistle	UPL
Solanum americanum	common nightshade	FAC
Sonchus asper ssp. *asper* *	prickly sowthistle	FAC
Torilis arvensis *	hedge parsley	UPL
Torilis nodosus *	knotted hedge parsley	UPL
Tribulus terrestris *	puncture vine	UPL
Trifolium hirtum *	rose clover	UPL
Verbena bonariensis *	purpletop vervain	FACW
Veronica peregrina ssp. *xalapensis*	purslane speedwell	OBL
Vicia sativa *	spring vetch	FACU
Xanthium strumarium	rough cockle-bur	FAC+
Grasses & Grass-like Plants		
Agrostis sp.	bent grass	undetermined
Aegilops triuncialis	barbed goatgrass	UPL
Avena barbata *	slender wild oat	UPL
Bromus diandrus *	ripgut brome	UPL
Bromus hordeaceus [B. mollis] *	soft chess	FACU-
Bromus madritensis ssp. *madritensis* *	Spanish brome	UPL
Crypsis sp.	pricklegrass	OBL
Cynodon dactylon *	Bermuda grass	FAC
Cyperus cf. esculentus	nutsedge	UPL
Cyperus difformis *	variable flatsedge	OBL
Cyperus eragrostis	umbrella sedge	FACW
Cyperus erythrorhizos	redroot flatsedge	OBL
Cyperus flavicomus *	whiteedge flatsedge	>FACW
Cyperus odoratus	redroot flatsedge	FACW
Digitaria sanguinalis *	hairy crabgrass	FACU
Distichlis spicata	saltgrass	FACW
Echinochloa colona *	jungle-rice	FACW
Echinochloa crus-galli *	barnyard grass	FACW
Hordeum murinum ssp. *leporinum* *	wall barley	NI
Juncus bufonius	toad rush	FACW+
Juncus effusus	soft rush	OBL
Leptochloa fascicularis	bearded sprangletop	OBL
Lolium multiflorum [L. perenne] *	Italian ryegrass	FAC*
Oryza sativa *	cultivated rice	OBL
Paspalum dilatatum	dallis grass	FAC
Phalaris aquatica *	bulbous canarygrass, Harding grass	FAC+
Poa annua *	annual bluegrass	FACW-

Scientific Name	Common Name	Wetland Indicator Status‡
Polypogon interruptus *	ditch rabbitsfoot grass	OBL
Polypogon monspeliensis *	rabbitsfoot grass	FACW+
Scirpus acutus var. occidentalis	common tule	UPL
Scirpus mucronatus *	ricefield bulrush	OBL
Setaria pumila *	yellow bristle grass	UPL
Sorghum halepense *	Johnsongrass	FACU
Taeniatherum caput-medusae *	Medusa-head	UPL
Typha angustifolia	narrowleaf cattail	OBL
Typha latifolia	broadleaf cattail	OBL
Vulpia bromoides *	foxtail fescue	FACW

‡ Wetland Indicator Status for Region 0, California:

OBL (obligate)—almost always occurs in wetlands (99% probability of occurrence in wetlands).

FAC (facultative)—equally likely to occur in wetlands or nonwetlands (34–66% probability).

FACU (facultative upland)—usually occurs in nonwetlands but occasionally occurs in wetlands (1–33% probability).

FACW (facultative wetland)—usually occurs in wetlands (67–99% probability).

UPL (obligate upland)—almost never occurs in wetlands (1% probability); in general, species that are not listed on the wetland plant list are assumed to be obligate upland species.

NI (no indicator)—no indicator status assigned because regional status information is lacking; the indicator status assigned to the species in the nearest adjacent region is applied, in this case, Region 9 (Northwest).

Undetermined—cannot be assigned an indicator status because plant could not be identified to species.

A plus (+) modifier indicates more frequently found in wetlands, a minus (-) modifier indicates less frequently found in wetlands; however, although these modifiers are used in Reed (1988), **they are not used in the Regional Supplements.** For example, FAC–, FAC, and FAC+ plants are all considered to be FAC. An asterisk (*) was assigned if the indicator status was derived from limited ecological information

Appendix C

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Central Valley Gas Storage Project City/County: Colusa County Sampling Date: 6-26-09

Applicant/Owner: Central Valley Gas Storage, LLC State: CA Sampling Point: 1

Investigator(s): Butterworth Section, Township, Range:

Landform (hillslope, terrace, etc.): flood plain Local relief (concave, convex, none): ditch Slope (%): 0

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

Soil Map Unit Name: Vina loam, 0 to 2 percent slopes (171) NWI classification:

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

Are Vegetation ___, Soil yes*, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil yes*, or Hydrology yes** 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:

* Native soil profile has been truncated. ** Water in ditch assumed to be irrigation tailwater from rice paddy.

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: r = 5 ft)			
1. Typha sp.	75	Y	OBL
2. Sorghum halepense	15	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

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:

SOIL

Sampling Point: 1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	10YR4/1	80	10YR4/4	20	C	M	sicl	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No ___

Remarks:

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ 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 ___ 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: Central Valley Gas Storage Project City/County: Colusa County Sampling Date: 6-26-09

Applicant/Owner: Central Valley Gas Storage, LLC State: CA Sampling Point: 2

Investigator(s): Butterworth Section, Township, Range:

Landform (hillslope, terrace, etc.): flood plain Local relief (concave, convex, none): levee road Slope (%): 0

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

Soil Map Unit Name: Vina loam, 0 to 2 percent slopes (171) 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 ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

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

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

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

Remarks:

* Levee road: vegetation partly removed by herbicide/from blading. ** Soil consists of fill material

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: r = 5 ft)			
1. unidentifiable detritus/forbs	10	Y	?
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ 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 ___ No assumed

Remarks:

SOIL

Sampling Point: 2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR3/1	100					grcl	Fill material.

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No x

Remarks:

Soil profile described from steep sideslope of ditch.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ 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 _____ No x Depth (inches): ---

Water Table Present? Yes _____ No x Depth (inches): none to 18

Saturation Present? (includes capillary fringe) Yes _____ No x Depth (inches): none to 18

Wetland Hydrology Present? Yes ____ No x

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Central Valley Gas Storage Project City/County: Colusa County Sampling Date: 6-26-09

Applicant/Owner: Central Valley Gas Storage, LLC State: CA Sampling Point: 3

Investigator(s): Butterworth Section, Township, Range:

Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): ditch Slope (%): 0

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

Soil Map Unit Name: Willows silty clay, 0 to 1 percent slopes, occasionally flooded (105) NWI classification:

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

Are Vegetation ___, Soil yes*, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil yes*, or Hydrology yes** 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:

* Native soil profile has been truncated. ** Water in ditch assumed to be irrigation tailwater from rice paddy.

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: r = 5 ft)			
1. Scirpus acutus	25	Y	OBL
2. Paspalum dilatatum	10	Y	FAC
3. Typha sp.	2	Y	OBL
4. Rumex crispus	2	Y	FACW
5.			
6.			
7.			
8.			
	39 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 61 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

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

SOIL

Sampling Point: 3

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

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

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No _____

Remarks:

Could not evaluate soil because access prevented by near-vertical sideslope of ditch banks. Hydric soil assumed to be present based on standing water in bottom of ditch (aquic moisture regime).

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ 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): 10

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: Central Valley Gas Storage Project City/County: Colusa County Sampling Date: 6-26-09

Applicant/Owner: Central Valley Gas Storage, LLC State: CA Sampling Point: 4

Investigator(s): Butterworth Section, Township, Range:

Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): levee road Slope (%): 0

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

Soil Map Unit Name: Willows silty clay, 0 to 1 percent slopes, occasionally flooded (105) 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 ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

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

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

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

Remarks:

* Levee road: vegetation partly removed by herbicide/from blading. ** Soil consists of fill material.

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: r = 5 ft)			
1. Centaurea solstitialis	30	Y	NL
2. Malvella leprosa	10	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	40 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ___ No x

Remarks:

SOIL

Sampling Point: 4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-18	10YR4/1	100					sic	Fill material

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No x

Remarks:

Soil profile described from steep sideslope of ditch.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ 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 _____ No x Depth (inches): ---

Water Table Present? Yes _____ No x Depth (inches): none to 18

Saturation Present? (includes capillary fringe) Yes _____ No x Depth (inches): none to 18

Wetland Hydrology Present? Yes ____ No x

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Central Valley Gas Storage Project City/County: Colusa County Sampling Date: 6-26-09

Applicant/Owner: Central Valley Gas Storage, LLC State: CA Sampling Point: 5

Investigator(s): Butterworth Section, Township, Range:

Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): ditch Slope (%): 0

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

Soil Map Unit Name: Alcapay clay, 0 to 1 percent slopes (155) NWI classification:

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

Are Vegetation ___, Soil yes*, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil yes*, or Hydrology yes* 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:

* Native soil profile has been truncated. ** Water in ditch assumed to be irrigation tailwater from rice paddy.

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: r = 5 ft)			
1. Typha sp.	30	Y	OBL
2. Cynodon dactylon	30	Y	FAC
3. Polypogon monspeliensis	20	Y	FACW
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust 0

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:

SOIL

Sampling Point: 5

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15	2,5YR4/1	85	7.5YR4/4	15	C	M	sicl	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No ___

Remarks:

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ 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): 2

Water Table Present? Yes x No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes x No ___ Depth (inches): 0

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: Central Valley Gas Storage Project City/County: Colusa County Sampling Date: 6-26-09

Applicant/Owner: Central Valley Gas Storage, LLC State: CA Sampling Point: 6

Investigator(s): Butterworth Section, Township, Range:

Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): levee road Slope (%): 0

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

Soil Map Unit Name: Alcapay clay, 0 to 1 percent slopes (155) 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 ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

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

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

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

Remarks:

* Levee road: vegetation partly removed by herbicide/from blading. ** Soil consists of fill material

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: r = 5 ft)			
1. Convolvulus arvensis	15	Y	NL
2. unidentifiable grass/detritus	5	Y	?
3.			
4.			
5.			
6.			
7.			
8.			
	20 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 80 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ___ No x

Remarks:

SOIL

Sampling Point: 6

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	7.5YR3/2	100					cl	Fill material

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No x

Remarks:

Soil profile described from steep sideslope of ditch.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ 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 _____ No x Depth (inches): ---

Water Table Present? Yes _____ No x Depth (inches): none to 16

Saturation Present? (includes capillary fringe) Yes _____ No x Depth (inches): none to 16

Wetland Hydrology Present? Yes ____ No x

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Central Valley Gas Storage Project City/County: Colusa County Sampling Date: 6-26-09

Applicant/Owner: Central Valley Gas Storage, LLC State: CA Sampling Point: 7

Investigator(s): Butterworth Section, Township, Range:

Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): swale/ditch Slope (%): 0-5

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

Soil Map Unit Name: Alcapay clay, 0 to 1 percent slopes (155) NWI classification:

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

Are Vegetation ___, Soil yes*, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

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

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

Hydrophytic Vegetation Present? Yes 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:

Roadside ditch/railroad ditch. * Native soil profile has been truncated approximately 6-12 inches.

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: r = 5 ft)			
1. Lolium multiflorum	105	Y	FAC
2. Picris echiodes	5	N	FACW
3. Lactuca serriola	2	N	FAC
4.			
5.			
6.			
7.			
8.			
	112 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

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:

SOIL

Sampling Point: 7

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR3/1	80	7.5YR4/4	20	C	PL, M	cl	A1 (partly truncated by ditch excav.)
4-16	10YR4/1	85	10YR4/4	15	C	M	c	A2

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No ___

Remarks:

Pore linings (PL) are oxidized rhizospheres.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ 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 ___ No x Depth (inches): ---

Water Table Present? Yes ___ No x Depth (inches): none to 16

Saturation Present? (includes capillary fringe) Yes ___ No x Depth (inches): none to 16

Wetland Hydrology Present? Yes x No ___

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

Remarks:

Minor biotic crust in places.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Central Valley Gas Storage Project City/County: Colusa County Sampling Date: 6-26-09

Applicant/Owner: Central Valley Gas Storage, LLC State: CA Sampling Point: 8

Investigator(s): Butterworth Section, Township, Range:

Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): planar Slope (%): 0

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

Soil Map Unit Name: Alcapay clay, 0 to 1 percent slopes (155) NWI classification:

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

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

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

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

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

Remarks:

VEGETATION

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: r = 5 ft)			
1. Bromus hordeaceous	40	Y	FACU
2. Bromus diandrus	35	Y	NL
3. Centaurea solstitialis	25	Y	NL
4. Latuca serriola	5	N	FAC
5.			
6.			
7.			
8.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No x

Remarks:

SOIL

Sampling Point: 8

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-17	10YR3/2	100					sicl	3% gravel

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No x

Remarks:

Native profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ 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 _____ No x Depth (inches): ---

Water Table Present? Yes _____ No x Depth (inches): none to 17

Saturation Present? (includes capillary fringe) Yes _____ No x Depth (inches): none to 17

Wetland Hydrology Present? Yes ____ No x

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Central Valley Gas Storage Project City/County: Colusa County Sampling Date: 6-26-09

Applicant/Owner: Central Valley Gas Storage, LLC State: CA Sampling Point: 9

Investigator(s): Butterworth Section, Township, Range:

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

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

Soil Map Unit Name: Alcapay clay, 0 to 1 percent slopes (155) NWI classification:

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

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

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

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

Hydrophytic Vegetation Present? Yes 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:

Marginal seasonal wetland.

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: r = 5 ft)			
1. Lolium multiflorum	50	Y	FAC
2. Cynodon dactylon	30	Y	FAC
3. Leymus triticoides	20	Y	FACW
4. Rumex crispus	3	N	FACW
5. Avena sp.	3	N	NL
6. Bromus hordeaceous	2	N	FACU
7.			
8.			
	108 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

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:

SOIL

Sampling Point: 9

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR4/1	70	10YR4/6	30	C	PL, M	c	A1
5-11	10YR3/1	100					c	A1

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No _____

Remarks:

Native profile.

Pore linings (PL) are oxidized rhizospheres.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ 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 _____ No x _____ Depth (inches): ---

Water Table Present? Yes _____ No x _____ Depth (inches): none to 11

Saturation Present? (includes capillary fringe) Yes _____ No x _____ Depth (inches): none to 11

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: Central Valley Gas Storage Project City/County: Colusa County Sampling Date: 6-26-09

Applicant/Owner: Central Valley Gas Storage, LLC State: CA Sampling Point: 10

Investigator(s): Butterworth Section, Township, Range:

Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): planar Slope (%): 50

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

Soil Map Unit Name: Alcapay clay, 0 to 1 percent slopes (155) NWI classification:

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

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

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

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

Remarks:

Sideslope of railroad bed.

* Railroad ballast.

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: r = 5 ft)			
1. Sorghum halepense	35	35	FACU
2. Lactuca serrlola	30	30	FAC
3. Avena sp.	5	5	NL
4. Leymus triticoides	5	5	FACW
5.			
6.			
7.			
8.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 25 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ___ No x

Remarks:

SOIL

Sampling Point: 10

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15	See remarks below						egrls	Fill material

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No x

Remarks:

Extremely gravelly loamy sand railroad ballast: insufficient fine earth to determine color of matrix.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ 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 _____ No x Depth (inches): ---

Water Table Present? Yes _____ No x Depth (inches): none to 15

Saturation Present? (includes capillary fringe) Yes _____ No x Depth (inches): none to 15

Wetland Hydrology Present? Yes ____ No x

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Central Valley Gas Storage Project City/County: Colusa County Sampling Date: 6-26-09

Applicant/Owner: Central Valley Gas Storage, LLC State: CA Sampling Point: 11

Investigator(s): Butterworth Section, Township, Range:

Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): ditch Slope (%): 0

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

Soil Map Unit Name: Alcapay clay, 0 to 1 percent slopes (155) NWI classification:

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

Are Vegetation ___, Soil yes*, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil yes*, or Hydrology yes** 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:

* Native soil profile has been truncated. ** Water in ditch assumed to be irrigation tailwater from rice paddy.

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: r = 5 ft)			
1. Schoenoplectus acutus	30	Y	OBL
2. Polygonum sp.	40	Y	OBL?
3. Rumex crispus	10	N	FACW
4. Xanthium strumarium	10	N	FAC
5.			
6.			
7.			
8.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

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:

SOIL

Sampling Point: 11

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

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

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No ____

Remarks:

Could not evaluate soil because access prevented by near-vertical sideslope of ditch banks. Hydric soil assumed to be present based on standing water in bottom of ditch (aquic moisture regime).

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ 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): 8

Water Table Present? Yes _____ No _____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): 0

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: Central Valley Gas Storage Project City/County: Colusa County Sampling Date: 6-26-09

Applicant/Owner: Central Valley Gas Storage, LLC State: CA Sampling Point: 12

Investigator(s): Butterworth Section, Township, Range:

Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): levee road Slope (%): 0

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

Soil Map Unit Name: Alcapay clay, 0 to 1 percent slopes (155) 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 ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

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

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

Hydrophytic Vegetation Present? Yes 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:

* Levee road: vegetation removed by blading. ** Soil consists of fill material

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: r = 5 ft)			
1. (barren)			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: n/a (A)

Total Number of Dominant Species Across All Strata: n/a (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ___ No x

Remarks:

Freshly graded levee road.

SOIL

Sampling Point: 12

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR4/1	65	7.5YR4/6	35	C	M	c	Fill material

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No x

Remarks:

Fill material: Sharp boundaries on redox features assumed to be inherited from source area from which soil was taken.

Soil profile described from steep sideslope of ditch.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ 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 _____ No x Depth (inches): ---

Water Table Present? Yes _____ No x Depth (inches): none to 16

Saturation Present? (includes capillary fringe) Yes _____ No x Depth (inches): none to 16

Wetland Hydrology Present? Yes ____ No x

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Central Valley Gas Storage Project City/County: Colusa County Sampling Date: 6-26-09

Applicant/Owner: Central Valley Gas Storage, LLC State: CA Sampling Point: 13

Investigator(s): Butterworth Section, Township, Range:

Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): none (planed) Slope (%): 0

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

Soil Map Unit Name: Willows silty clay, 0 to 1 percent slopes, occasionally flooded (105) NWI classification:

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

Are Vegetation yes**, Soil ___, or Hydrology yes* 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:

* Area is normally flood irrigated. ** Seeded rice.

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: r = 5 ft)			
1. Oryza sativa	100	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

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:

SOIL

Sampling Point: 13

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

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

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No ____

Remarks:

No soil pit was excavated: plant cover is 100% OBL and surface water (4 to 6 inches) is present. Aquic conditions are assumed.

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ 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 _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes x No ____

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

Remarks:

Water on field on date of field survey is from flood irrigation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Central Valley Gas Storage Project City/County: Colusa County Sampling Date: 6-26-09

Applicant/Owner: Central Valley Gas Storage, LLC State: CA Sampling Point: 14

Investigator(s): Butterworth Section, Township, Range:

Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): none (planed) Slope (%): 0

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

Soil Map Unit Name: Alcapay clay, 0 to 1 percent slopes (155) NWI classification:

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

Are Vegetation yes**, Soil ___, or Hydrology yes* 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:

* Area is normally flood irrigated. ** Seeded rice.

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: r = 5 ft)			
1. Oryza sativa	100	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

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:

SOIL

Sampling Point: 14

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

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

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No _____

Remarks:

No soil pit was excavated: plant cover is 100% OBL and surface water (4 to 6 inches) is present. Aquic conditions are assumed.

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ 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 _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes x No _____

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

Remarks:

Water on field on date of field survey is from flood irrigation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Central Valley Gas Storage Project City/County: Colusa County Sampling Date: 3-5-09

Applicant/Owner: Central Valley Gas Storage, LLC State: CA Sampling Point: 15

Investigator(s): Butterworth Section, Township, Range:

Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): none (planed) Slope (%): 0

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

Soil Map Unit Name: Willows silty clay, 0 to 1 percent slopes (106) NWI classification:

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

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

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

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

Remarks:

* Area is normally flood irrigated. ** See Remarks under Vegetation.

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: r = 5 ft)			
1. Triticum sp.*	60	Y	NL
2. Poa annua	20	Y	FACW
3. Malvella leprosa (?)	<1	N	FAC
4. Trifolium sp.	<1	N	NL
5.			
6.			
7.			
8.			
	82 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ___ No x

Remarks:

* Based on information from property owner, the field is rotational field that is rotated into wheat, rice, and row crops. During the field visit, the site appears to have been last cultivated in wheat.

SOIL

Sampling Point: 15

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR3/1	75	10YR4/4 &	15	c	M	sic	Ap horizon
			10YR5/4	10	c	M		
8-14	10YR3/2	95	10YR4/1	5	d	PL	sic	A horizon

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No ___

Remarks:

Ap horizon redox feature boundaries are diffuse (i.e., contemporary).

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**)
- ___ 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)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ 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): 3

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

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

Wetland Hydrology Present? Yes ___ No x

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

Remarks:

Soil below 9 inches depth is not saturated, so perched water table is present. Oxidized rhizospheres on dirt clods from upper 3 inches of profile; these may have formed from flooding of irrigation water rather than natural rainfall. Water on field is clear. Water on field is probably from recent rainfall (rather than irrigation water), as no water was observed entering field at upslope end to the north. (Note: Above average rainfall occurred in two weeks prior to field survey; amount of water may not be representative of normal conditions. Only small, very shallow areas of water present on adjoining fields.)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Central Valley Gas Storage Project City/County: Colusa County Sampling Date: 1-15-09

Applicant/Owner: Central Valley Gas Storage, LLC State: CA Sampling Point: 16

Investigator(s): Butterworth, Widdowson Section, Township, Range:

Landform (hillslope, terrace, etc.): flood plain Local relief (concave, convex, none): none Slope (%): 0-2

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

Soil Map Unit Name: Moonbend silt loam, 0 to 2 percent slopes (125) NWI classification:

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

Are Vegetation ___, Soil yes**, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

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

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

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

Remarks:

* Fallow field. ** Native soil profile may have been partly cut or filled from land smoothing. Data point located near well pad in area not regularly planted.

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: r = 5 ft)			
1. Malvella leprosa	15	Y	FAC
2. Chamaesyce maculata	5	Y	UPL
3. Convolvulus arvensis	5	N	UPL
4. Poa annua	5	N	FACW
5. Picris echiodes	5	N	FACW
6.			
7.			
8.			
	35 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 65 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ___ No x

Remarks:

Site is not cultivated/planted. Overall field is known by applicant and by local resident to be used for tomatoes, wheat, and other non-rice crops. Field contains corn cobs on surface from previous harvest.

SOIL

Sampling Point: 16

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR3/2	100					sil	Ap Horizon
8-18	10YR3/3	100					sil	Bw horizon

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No x

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ 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 _____ No _____ Depth (inches): ---

Water Table Present? Yes _____ No _____ Depth (inches): none to 18

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): none to 18

Wetland Hydrology Present? Yes ____ No x

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

Remarks:

Appendix D

Representative Photographs

Photo 1. View of proposed compressor station site, right side of road in front of buildings. Site is fallow field at time of photo. Looking south from intersection of McAusland and Paradise roads.

Photo 2. Other waters drainage (irrigation ditch).

Photo 3. Other waters drainage (irrigation ditch), with rice field in right-middleground.

Photo 4. Wetland drainage dominated by cattail. Looking east at data points 1 and 2.

Photo 5. Other waters drainage (irrigation canal). Looking east.

Photo 6. Other waters drainage (Colusa Trough). Looking north.

Photo 7. Seasonal wetland, looking north. Data Point 9 is in middle-foreground.

Appendix E

List of Drainages and Potential Crossing Methods

Appendix E. List of Drainages and Potential Crossing Methods

Drainage Number[1]	Drainage Type	Estimated Width (ft)	Wetland Vegetation Present at Crossing	Status as a Waters of the United States at Crossing	Potential Crossing Method[2]
D-1	Roadside Ditch	2	None	Other waters	Trench
D-1a	Roadside Ditch	3	Freshwater marsh	Wetland	Avoided by alignment
D-2	Roadside Ditch	1	None	Other waters	Trench
D-3	Roadside Ditch	1	None	Other waters	Avoided by alignment
D-4	Roadside Ditch	1	None	Other waters	Avoided by alignment
D-5	Canal	12	None	Other waters	Auger bore
D-6	Canal	15	Fremont cottonwood riparian woodland (above OHWM)	Other waters	Auger bore
D-7	Agricultural Ditch	8	Freshwater marsh	Wetland	Trench
D-8	Agricultural Ditch	5	None	Other waters	Trench
D-9	Agricultural Ditch	5	None	Other waters	Trench
D-10	Canal	15	None	Other waters	Trench
D-10a	Canal	15	Scattered riparian woodland species (above OHWM)	Other waters	Auger bore
D-11	Agricultural Ditch	12	None	Other waters	Auger bore
D-12	Agricultural Ditch	15	None	Other waters	Avoided by alignment
D-13	Agricultural Ditch	5	None	Other waters	Avoided by alignment
D-14	Agricultural Ditch	12	Freshwater marsh	Wetland	Auger bore
D-15	Agricultural Ditch	3	Freshwater marsh	Wetland	Avoided by alignment
D-16	Agricultural Ditch	5	Freshwater marsh	Wetland	Avoided by alignment
D-17	Canal	12	None	Other waters	Auger bore (one crossing)
D-18	Canal	10	Freshwater marsh	Wetland	Avoided by alignment
D-19	Colusa Trough	80	Primarily open water with narrow fringe of freshwater marsh	Wetland/Other waters	HDD
D-19a	Willow Creek	40	Primarily open water with narrow fringe of freshwater marsh	Wetland/Other waters	Avoided by alignment
D-19b	Colusa Drain	45	Primarily open water with narrow fringe of freshwater marsh	Wetland/Other waters	Avoided by alignment
D-20	Canal	25	Freshwater marsh	Wetland	Avoided by alignment
D-21	Central Drain	30	Freshwater marsh	Wetland	Avoided by alignment
D-22	Canal	15	Freshwater marsh	Wetland	Avoided by alignment
D-23	Logan Creek	60	Primarily open water with narrow fringe of freshwater marsh	Wetland/Other waters	Auger bore
D-24	Canal	25	Freshwater marsh	Wetland	Trench
D-25	Agricultural Ditch	10	Freshwater marsh	Wetland	Auger bore
D-26	Agricultural Ditch	10	Freshwater marsh	Wetland	Auger bore
D-27	Agricultural Ditch	12	Freshwater marsh	Wetland	Avoided by alignment

Drainage Number[1]	Drainage Type	Estimated Width (ft)	Wetland Vegetation Present at Crossing	Status as a Waters of the United States at Crossing	Potential Crossing Method[2]
D-28	Agricultural Ditch	2	Freshwater marsh	Wetland	Avoided by alignment
D-29	Agricultural Ditch	10	Scattered freshwater marsh vegetation	Wetland	Avoided by alignment
D-30	Hunters Creek	50	None	Other waters	Auger bore
D-31	Canal	15	Freshwater marsh	Wetland	Auger bore
D-32	Canal	20	None	Other waters	Auger bore
D-33	Agricultural Ditch	15	Freshwater marsh	Wetland	Auger bore
D-34	Canal	20	Scattered freshwater marsh vegetation	Wetland	Avoided by alignment
D-35	Agricultural Ditch	3	Freshwater marsh	Wetland	Avoided by alignment
D-36	Agricultural Ditch	4	Freshwater marsh	Wetland	Avoided by alignment
D-37	Agricultural Ditch	5	None	Other waters	Avoided by alignment
D-38	Canal	25	None	Other waters	Auger bore
D-39	Agricultural Ditch	12	None	Other waters	Auger bore
D-40	Agricultural Ditch	10	None	Other waters	Trench
D-41	Agricultural Ditch	6	None	Other waters	Trench
D-42	Agricultural Ditch	8	Wetland	Wetland	Avoided by alignment
D-43	Hunters Creek	20 to 40	Fremont cottonwood riparian woodland (above OHWM)	Other waters	Auger bore or HDD (three crossings of Hunters Creek)
D-44	Agricultural Ditch	10	Freshwater marsh	Wetland	Trench
D-45	Agricultural Ditch	8	Freshwater marsh	Wetland	Trench
D-46	Agricultural Ditch	6	Freshwater marsh	Wetland	HDD
D-46a	Roadside Ditch	3	Herbaceous weedy seasonal wetland	Wetland	HDD
D-47	Roadside Ditch	6	Freshwater marsh	Wetland	HDD
D-48	Agricultural Ditch	6	Freshwater marsh	Wetland	Avoided by alignment
D-49	Agricultural Ditch	8	None	Other waters	Trench
D-50	Agricultural Ditch	10	None	Other waters	Avoided by alignment
D-51	Agricultural Ditch	10	None	Other waters	Avoided by alignment
D-52	Agricultural Ditch	8	None	Other waters	Trench
D-53	Agricultural Ditch	8	Freshwater marsh	Wetland	Avoided by alignment
D-54	Agricultural Ditch	12	Freshwater marsh	Wetland	Avoided by alignment
D-55	Agricultural Ditch	6	Freshwater marsh	Wetland	Avoided by alignment
D-56	Agricultural Ditch	12	Freshwater marsh	Wetland	Avoided by alignment

Drainage Number[1]	Drainage Type	Estimated Width (ft)	Wetland Vegetation Present at Crossing	Status as a Waters of the United States at Crossing	Potential Crossing Method[2]
D-57	Roadside Ditch	4	Seasonal wetland vegetation	Wetland	Auger bore
D-58	Roadside Ditch	6	Seasonal wetland vegetation	Wetland	Avoided by alignment
D-59a	Agricultural Ditch	8	None	Other waters	Avoided by alignment
D-59	Agricultural Ditch	8	Woody riparian and freshwater marsh	Wetland	Avoided by alignment
D-60	Agricultural Ditch	12	None	Other waters	Avoided by alignment
D-61	Glenn-Colusa Canal	90	None	Other waters	HDD
D-62	Agricultural Ditch	15	Freshwater marsh	Wetland	HDD

Table Notes:

[1]**Drainage Number**
The drainage number corresponds to the project alignment maps provided in Exhibit 1.

[2]**Potential Crossing Method**
The crossing methods will be determined as part of the pipeline engineering and design phase. Some of the drainages shown as "avoided by alignment" may actually be trenched or bored. The pipeline construction methods (including open-cut trench, auger bore, and horizontal directional [HDD] drilling methods) are described in detail in Chapter 2 of the PEA.