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CALIFORNIA VALLEY SOLAR RANCH PROJECT
SAN LUIS OBISPO COUNTY, CALIFORNIA
OFF-SITE WETLAND MITIGATION AND MONITORING PLAN

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PROJECT REQUIRING MITIGATION

LOCATION AND SITE DESCRIPTION

The 4555 acre (ac) California Valley Solar Ranch (CVSR) Project Site is located along State Route 58 between U.S. Route 101 and U.S. Route 5 in an unincorporated area of eastern San Luis Obispo County, California (Figure 1). The project includes development of a solar generation facility that will establish a 250 megawatt solar power plant. The solar facility will include 10 solar photovoltaic arrays that will cover approximately 1400 ac, as well as on-site access roads, a substation, an operations and maintenance building, a reverse osmosis water system and water tank, water treatment ponds, underground and overhead electrical and transmission lines, and temporary facilities. The CVSR Project Site is situated along the northeast rim of the Carrizo Plain, which is a closed drainage sub-basin bordered by the Temblor Range to the northeast and the Caliente Range to the southwest (Hoover 1970). The San Andreas Rift Zone also extends along the northeast boundary of the plain and immediately adjacent to the project site. Surface water in the region drains to the south and forms Soda Lake, which is ~3.0 miles (mi) south of the project site (Figure 1).

The project site occurs on the U.S. Geological Survey (USGS) 30 minute by 60 minute 1:100,000 Taft quadrangle map (USGS 2003). Elevation ranges from approximately 1970 feet (ft) National Geodetic Vertical Datum (NGVD) in the southwest corner to approximately 2625 ft NGVD at the far north end of the site. Natural topography on the site is generally flat with rolling hills and narrow, long fault scarps where the San Andreas rift zone trends along the eastern edge of the project site. Average annual precipitation ranges from 8 to 10 inches per year, and average annual temperatures are between 57 and 61 degrees Fahrenheit (NRCS 2001). Most of the yearly precipitation occurs from November through February.

The CVSR Project Site is currently used for cattle grazing. There are remnant farm structures, equipment from past farming activities, and 2 abandoned gypsum mines that will be reclaimed as part of the project. In general, undeveloped/vacant and agricultural lands surround the property. However, there are a few developed residential lots and small farms in the area. Immediately south of the project site is a complex of roads that have been graded for the mostly unoccupied, California Valley subdivision. Prior land use practices of the project site include livestock grazing, dryland farming (grain crops), and gypsum mining. The majority of the CVSR Project Site has been disked owing to dryland farming practices.

Due to very limited opportunities for creation of new wetland habitat on the CVSR project site, wetland mitigation is proposed to be implemented on the Diefenderfer Property, a 995-ac property located approximately 3 mi to the west of the CVSR Project Site (NC-01, NC-02, NC-03). The Diefenderfer Property is currently dryland farmed for various grain crops including barley and oats. In between crops, the property is lightly grazed by cattle. It has slightly undulating topography although repeated tillage has largely smoothed much of the historic topographic relief.

This site specific Wetland Mitigation and Monitoring Plan has been developed for the Diefenderfer Property and provides a detailed description of impacts, mitigation ratios, existing

habitat functions and values, a conceptual design for the project, a monitoring plan, and a maintenance plan.

PROJECT SUMMARY

Project Purpose

The purpose of this wetland mitigation project is to mitigate for 0.42 ac of impacts to wetland habitat on the CVSR Project Site (Figure 2) as required by the Regional Water Quality Control Board (RWQCB) and California Department of Game and Fish (CDFG).

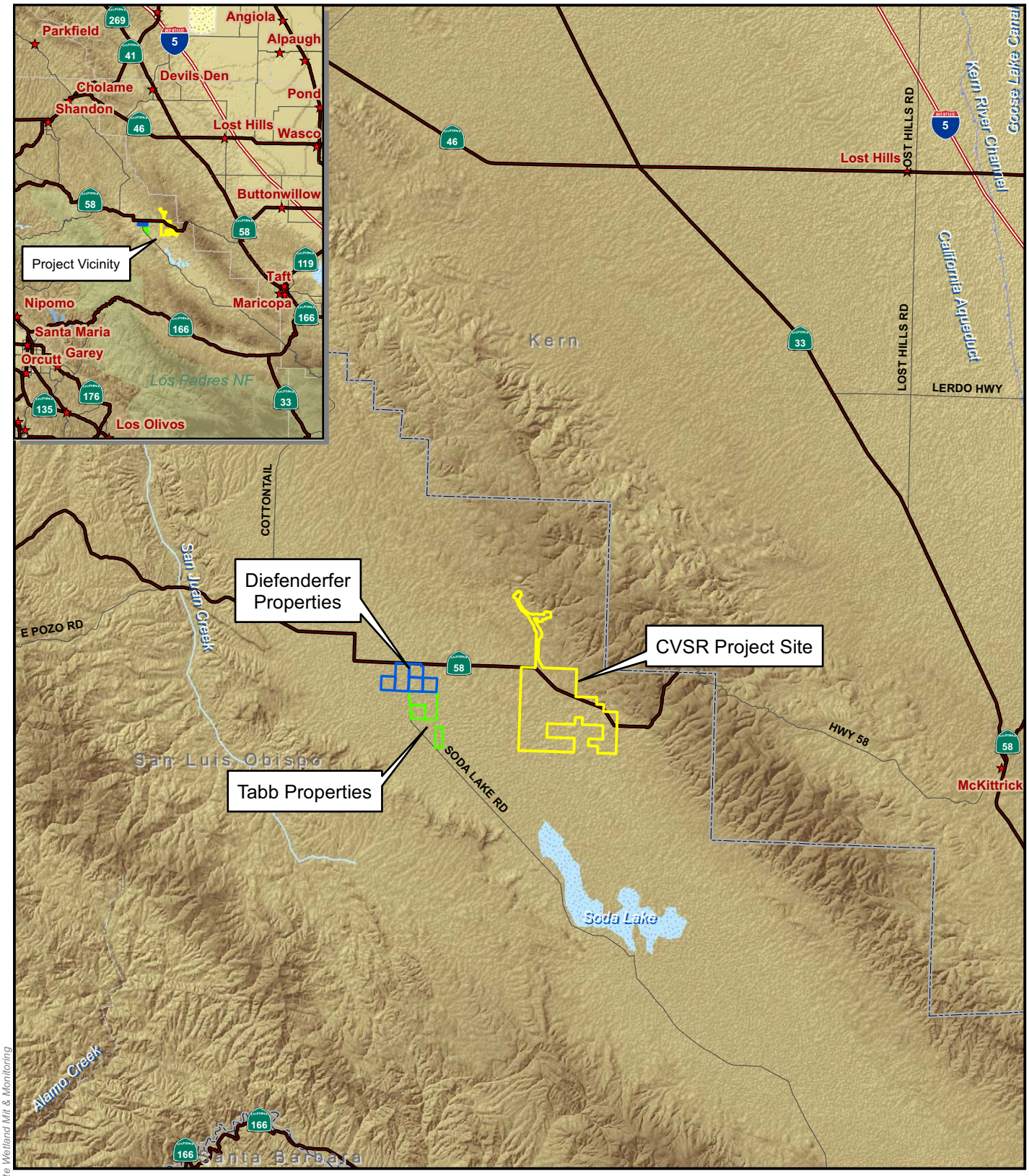
Habitat Impacts and Mitigation

Construction of the CVSR Project will impact freshwater wetland habitat within the jurisdiction of the RWQCB and CDFG. This Mitigation and Monitoring Plan (MMP) describes the type and quantity of impacts to jurisdictional habitats and presents the conceptual mitigation and monitoring plan to compensate for these impacts.

CHARACTERISTICS OF JURISDICTIONAL HABITAT IMPACT AREAS

Impact Type, Location, and Surface Area

This project has been designed to avoid and minimize impacts to existing wetlands while creating new habitat within an area determined to be suitable to support additional wetlands. Table 1 summarizes the surface area of impacts to jurisdictional wetland habitat as a result of landform grading associated with construction, road re-alignment and reclamation of an abandoned gypsum mine. The locations of these areas are shown in Figure 2.



Legend

- CVSR Biological Study Area
- Tabb Properties
- Diefenderfer Properties

Scale

1:316,800

1 inch = 5-miles

0 5 Miles

Coordinate System: North American Datum 83 Universal Trans Mecator (UTM) Zone 11 North

Data Sources: [1] CA GIS Library, [2] ESRI BaseMap USA (2010),

California Valley Solar Ranch

CVSR Project Site, Off-site Wetland Mitigation and Monitoring Plan

Figure 1: Project Vicinity Map

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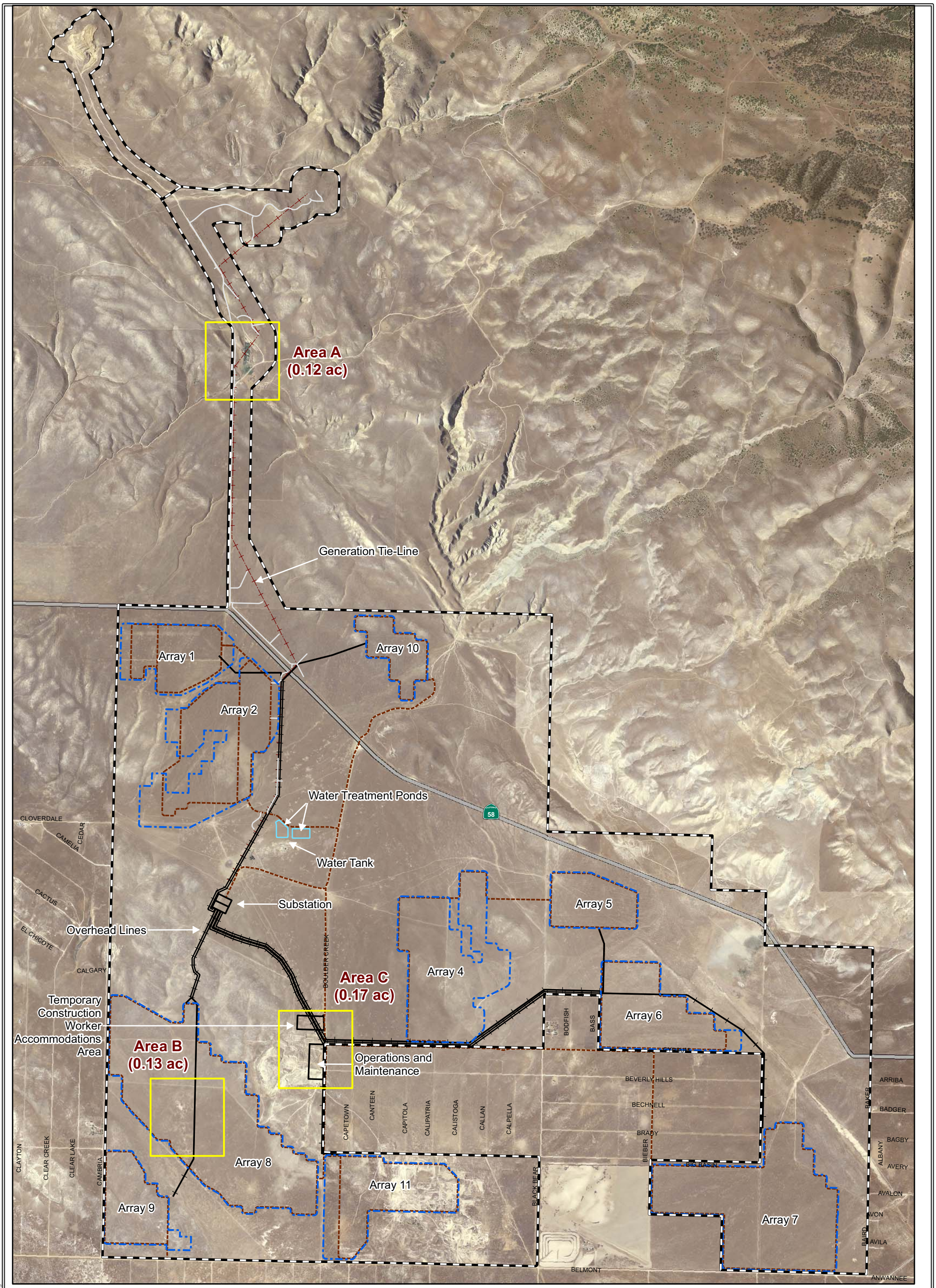

Legend

- Biological Study Area Boundary
- Solar Panel Arrays
- Medium Voltage Lines - Overhead (double)
- Medium Voltage Lines - Overhead (single)
- Medium Voltage Lines - Underground
- Generation Tie-Line
- Fire Roads
- Access Roads
- Wetlands Impact Area

Scale

1:26,400

1 inch = 2,200 feet

0 1,100 2,200 4,400 Feet

Coordinate System: North American Datum 83 Universal Trans Mecator (UTM) Zone 11 North

California Valley Solar Ranch

CVSR Project Site, Off-site Wetland Mitigation and Monitoring Plan

Figure 2: CVSR Project Site Wetlands Impacts

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Table 1. Summary of Impacts to RWQCB and CDFG Jurisdictional Habitats

HABITAT TYPE	IMPACT SURFACE AREA (AC)	IMPACT TYPE AND LOCATIONS
Freshwater wetland	0.42	Landform grading and general construction activities

Below is a detailed account of the expected wetland habitat impacts:

Area A. The filling of wetland habitat will occur during construction to improve the Twisselman Mine Road en route to the proposed Pacific Gas & Electric (PG&E) switching station. Impacts to Area A will total 0.12 ac.

Area B. Impacts to existing wetland habitat will be associated with the construction of Array 8. Impacts to Area B will total 0.13 ac.

Area C. Impacts will result from filling 2 wetlands adjacent to the Temporary Construction Worker Accommodation Area and the Operations and Maintenance Facility (currently part of an abandoned gypsum mine). Impacts to Area C will total 0.17 ac.

Habitat Function

Physical and Chemical Functions. The wetland sites to be impacted are a portion of a limited wetland habitat within a low rainfall, rangeland setting. They provide the typical physical and chemical functions associated with freshwater wetland habitat including nutrient cycling, sediment storage/retention, and water filtration.

General Wildlife Functions. The ephemeral nature of the wetlands to be impacted and their relatively small surface area limits their use by wildlife. However, because wetland habitat is scarce in the region, those which do exist provide essential breeding and foraging habitat for resident species such as Pacific tree frog (*Pseudacris regilla*), western spadefoot toad (*Spea hammondii*), long-billed curlew (*Numenius americanus*), American avocet (*Recurvirostra Americana*), and killdeer (*Charadrius vociferus*).

CONCEPTUAL WETLAND HABITAT MITIGATION DESIGN

WETLAND MITIGATION

Mitigation Ratios and Surface Area

Impacts to existing wetlands are considered permanent because wetland habitat is not expected to naturally re-establish in the impacted areas. The permanent wetland habitat impacts will be mitigated off-site at a 1.5:1 ratio (mitigation surface area:impact surface area) (Table 2). The Diefenderfer Property, a 995 ac property located approximately 3 mi to the west of the CVSR Project Site (Figure 1), supports soil conditions along a portion of the southern boundary that are suitable for restoring wetland habitat.

The total surface area of wetland mitigation on the Diefenderfer Property will be at least 0.63 ac (0.42 ac of wetland impacts * 1.5 mitigation ratio) (Table 2). To ensure that mitigation acreage requirement is met, approximately 0.81 ac of new wetland habitat will be restored within a portion of the property that is underlain by suitable clay-rich soils (Figure 3). Although a surplus of wetland mitigation will be constructed, the project mitigation target remains at 0.63 ac of new wetland habitat.

Table 2. Surface Area of Wetland Impacts and Proposed Mitigation

IMPACT TYPE	IMPACT AREA (AC)	MITIGATION RATIO (MITIGATION AREA: IMPACT AREA)	MITIGATION AREA (AC)
Permanent wetland impacts	0.42	1.5	0.63

Location and Ownership Status

The proposed wetland mitigation will occur on the Diefenderfer Property under option by the applicant. The proposed wetland mitigation sites are located within the area shown on Figure 3 as "Vicinity of Wetland Mitigation Sites". Within that area depicted we identified, as further described below, a series of sites in which wetland restoration will be implemented to meet the acreage target.

Topography and Soils

The elevation of the Diefenderfer Property is approximately 2000 ft National Geodetic Vertical Datum (NGVD). The topography is undulating with relatively low relief (± 3 ft). Loam and clay-loam soils (NRCS Soil Series 310, Yeguas-Pinspring complex, 0 to 2% slopes) were mapped by the NRCS (NRCS 2001) in the portion of the Diefenderfer Property underlying the proposed wetland mitigation area. However, after extensive field reconnaissance it was determined that NRCS Soil Series 361 (Chicote complex, 2 to 5% slopes) actually extends from an adjacent area into the wetland mitigation location. This soil is a more clay-rich series and is highly suitable for supporting wetland habitat. This suitability is affirmed by the presence of

extensive wetland habitat on Chicote complex soils on the nearby Tabb Property, which abuts the southern boundary of the Diefenderfer Property east of Soda Lake Road (Figure 1).

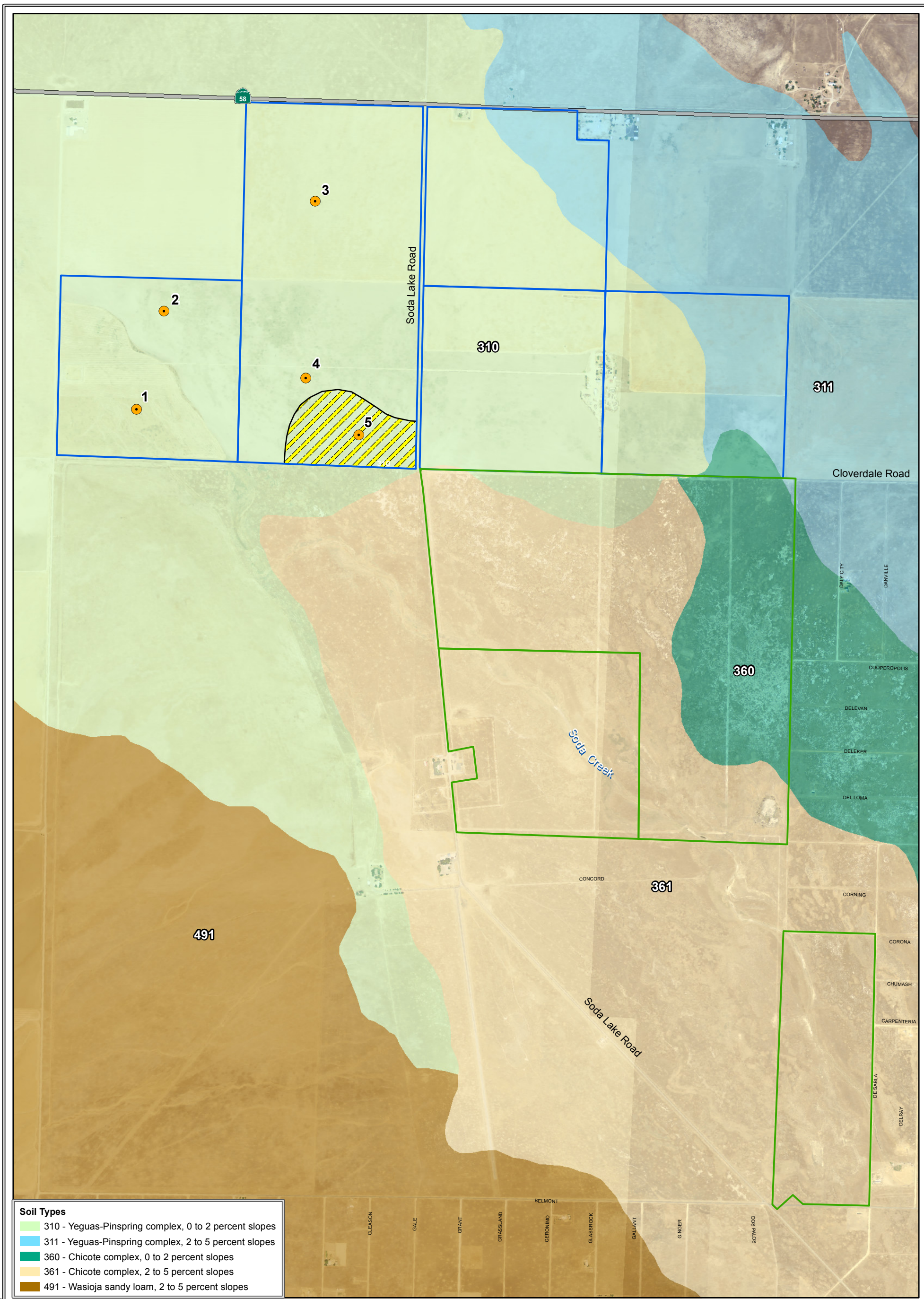
Detailed physical characteristics of soils sampled on the Diefenderfer Property are presented in Table 3. Samples 1-4 were determined to be coarse textured soils that were not suitable for supporting wetland habitat. Sample 5 includes substantially more clay than the other areas and is texturally comparable to soils observed on the Tabb Property in existing wetlands. Based on further field observations of soil conditions the areas considered suitable for wetland mitigation were expanded well beyond the location of Sample 5. See Appendix A for complete soil textural analyses. A total of 16 locations were identified with micro-topographic depressions formed in clay dominated soils that provide eminently suitable wetland restoration sites. Field measurements of these sites combined for a total of 0.81 ac that, with minor grading, could provide restored wetland habitat. These sites are located with the boundaries of the area shown on Figure 3 as "Vicinity of Wetland Mitigation Sites".

Vegetation and Wildlife

Vegetation on the Diefenderfer Property is limited to crop stubble (e.g., barley and oats) in recently cultivated areas and various weed species, including bindweed (*Convulvulous arvensis*) in fallow areas. The property currently supports only marginal habitat for regionally important wildlife species due to ongoing and extensive dryland farming activities.

Hydrology

Field observations on the adjacent Tab Property suggest that the wetland hydrology there is driven by direct precipitation, with little if any overland hydrologic connectivity. On Diefenderfer dryland farming has disrupted and/or eliminated historic overland hydrologic connectivity. However, as with the Tab Property, the Diefenderfer soils within the proposed mitigation area will support wetland hydrology via, direct precipitation. The cessation of farming activities will further improve conditions for wetland restoration on Diefenderfer by allowing some increase in overland flow into the wetlands.



Legend

- Diefenderfer Properties
- Tabb Properties
- Area Suitable for Wetland Mitigation
- Sample Points

Data Sources: [1] San Luis Obispo County Graphic Information Systems (February 2000), [2] ESRI StreetMap USA (2010), [3] USDA NAIP 2009

Scale

1:15,840

1 inch = 0.25-miles

0 0.125 0.25 0.5 Miles

Coordinate System: North American Datum 83 Universal Trans Mecator (UTM) Zone 11 North

California Valley Solar Ranch

CVSR Project Site, Off-site Wetland Mitigation and Monitoring Plan

Figure 3: Vicinity of Wetland Mitigation Sites

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Table 3. Sample Number, Pit Depth, Sand, Silt and Clay content, and USDA Soil Classification on the Diefenderfer Property

SAMPLE NUMBER	PIT DEPTH (IN)	SAND (%)	SILT (%)	CLAY (%)	USDA SOIL CLASSIFICATION
1.1	12	51.6	41.5	24.8	Loam
1.2	24	53.6	21.5	24.8	Sandy clay loam
2.1	12	35.6	37.5	26.8	Loam
2.2	24	25.6	35.5	38.8	Clay loam
3.1	12	45.6	29.5	24.8	Loam
3.2	24	49.6	25.5	24.8	Sandy clay loam
4.1	12	41.6	39.5	18.8	Loam
4.2	24	37.6	37.5	24.8	Loam
5.1	12	36.6	28.0	35.3	Clay loam
5.2	24	36.6	21.0	42.2	Clay

Basis of Design

The wetland mitigation will involve the restoration of seasonal wetland habitat characterized by shallow pools similar to existing wetlands on the Tab Property (see Appendix B for images of existing wetland habitat on the Tab Property). The mitigation site has soils and hydrology suitable for wetland restoration, and with an active revegetation effort, functional and naturally sustained seasonal wetlands will be established on the sites within 3-5 years. This proposed wetland creation will have the landscape scale ecological benefit of increasing the acreage of wetland habitat on the Carrizo Plain.

Proposed Wetland Mitigation-site Functions and Values

Hydrology/Topography/Soils. The hydrology, topography, and soil conditions for the proposed wetland mitigation site have been thoroughly investigated in the field. The hydrology is driven entirely by rainfall which averages 8 to 10 in/year (NRCS 2001). The topography is undulating yet of relatively low relief (± 3 ft). Despite the low relief and the constant disturbance caused by dryland farming, the portion of the Diefenderfer Property proposed for wetland mitigation is dominated by soils suitable for wetland creation. Soils in this area are largely clay-dominated in the upper 1 to 2 ft.

Vegetation. The wetland vegetation to be established on the Diefenderfer Property will comprise wetland species similar to those found in existing seasonal wetlands on the Tab Property and throughout the region. The Implementation Plan section of this document provides more detailed information of the recommended seed mix.

Wildlife. The wetland habitat to be created will be of high quality for wildlife. The proposed wetland mitigation design will replace wetland habitat impacted on the CVSR Project Site at a 1.5:1 ratio, thereby avoiding any regional reduction in wildlife habitat value compared with existing conditions. Wetland habitat created as a result of this mitigation will expand the amount of habitat available to wetland-associated species such as western tree frog, western spadefoot toad, long-billed curlew, American avocet, and killdeer.

Present and Historical Uses of the Proposed Wetland Mitigation Areas. The proposed wetland mitigation area is confined to disturbed areas of the Diefenderfer Property west of Soda Lake Road. Its historical use is associated with high-intensity dryland farming in which fields were disked multiple times per year and planted biannually.

IMPLEMENTATION PLAN

WETLAND MITIGATION

The following section presents the Implementation Plan for the wetland mitigation proposed on the Diefenderfer Property. Wetland vegetation comparable to existing shallow, depressional wetland habitat elsewhere on the adjacent Tab Property will be established via direct seeding. Wetland revegetation activities will be focused within the footprint of the created pools as well as all adjacent areas disturbed during construction.

Site Preparation

Site preparation for the proposed wetland mitigation will involve very shallow excavation in some locations and slight compaction in others. In both cases, site preparation will result in soil conditions suitable for the rapid establishment of wetland vegetation. In locations where excavation is necessary, cuts will be shallow (approximately 4 to 8 in) and will daylight soils suitable for seasonally ponding water and supporting establishment of target wetland vegetation. Compaction will be employed, as needed, in areas where deep ripping associated with farming practices has left large-diameter soil clods to create surface conditions more amenable to surface ponding. Light compaction will also increase seed/soil contact and will enhance vegetation establishment. Compaction will be achieved through track walking the footprint of the wetland area with a low ground pressure piece of heavy machinery. Refer to Figure 4 for general cross sections of the proposed wetland features.

Wetland construction will occur under dry site conditions. The site will be accessed through an existing internal farm road. Shallow excavation will be undertaken to mimic the approximate sizes and shapes of the existing wetlands on the Tab Property. Soil compaction will be employed where past farming practices included deep ripping the soil profile, leaving large soil clods. Compaction will be no greater than 90% to facilitate the ponding of water while not constraining wetland plant establishment. Excavated soil will be spread in adjacent upland areas and compacted to no greater than 90% to facilitate upland vegetation re-establishment. It is anticipated that the construction will take approximately 2-4 weeks and will require a small bulldozer, small excavator and/or front end loader, 1-2 dump trucks, water tender and small crew of hand laborers. The created pools will provide ponding depths and durations as well as vegetation cover and composition similar to the wetlands on the Tab Property (Appendix B).

Wetland Revegetation Plan

The diversity and abundance of native wetland plants extant on the Tab Property in the vicinity of the proposed mitigation are significant and provide excellent reference conditions. Despite this local resource, there is no connectivity between the proposed mitigation wetlands and those occurring on Tabb even under above average rainfall. Because few wetland plant seeds are expected to initially naturally disperse into the created pools post-excavation, the disturbed soils within and adjacent to the created wetlands will be seeded with appropriate native species to reduce soil erosion and facilitate wetland habitat establishment. Table 4 provides the wetland mitigation seed mix. Some plant species listed in the seed mix may not be commercially

available at the time of seeding. Therefore, provided application rates reflect potential availability constraints.

Table 4. Wetland Mitigation Seed Mix

SCIENTIFIC NAME	COMMON NAME	NATIVE/ NON-NATIVE	APPLICATION RATE PLS[1]/AC (LBS)
Achyrachena mollis	Blow wives	Native	0-1
Atriplex argentea	Silver saltweed	Native	0-5
Atriplex coronata var. *coronata*	Crownscale	Native	0-5
Deschampsia danthonioides	Annual hairgrass	Native	0-2
Frankenia salina	Alkali heath	Native	0-10
Hordeum brachyantherum	Meadow barley	Native	0-8
Lasthenia ferrisiae	Alkali goldfields	Native	0-1
Lasthenia fremontii	Vernal pool goldfields	Native	0-3
Leymus triticoides	Creeping wildrye	Native	0-4
Plagiobothrys acanthocarpus	Alkali plagiobothrys	Native	0-2
Trifolium depauperatum var. *amplectens*	Pale sack clover	Native	0-5
		Total	**A min of 30 lbs of PLS/AC[2]**

[1] Pure Live Seed (PLS) = [(% purity of seed lot x % germination rate of species)/100]; Divide recommended application rate (lbs) above by % PLS for each species to find total lbs. required to provide the application rate shown in table.

[2] Total will depend on seed availability at the time of seeding.

To maintain local genetic diversity and integrity, all seed material for wetland seeding will be sourced from within the Carrizo Plain or from within a 25-mi radius, and within ± 1000 ft elevation of the project area. In the event that seed material cannot be sourced from these areas, then seed from an expanded area including San Luis Obispo, western Kern County, or other appropriate areas within adjacent counties will be considered acceptable. All seed material will be obtained from a local seed supplier familiar with wetland species of this region.

Seed will be tested for percent purity, percent germination, number of pure live seeds per pound, and weed seed content. Seed testing will be the responsibility of the seed supplier.

Adjacent upland areas disturbed during construction, will be seeded as part of the California annual grassland restoration planned for the property. Please refer to the Off-site Mitigation Properties Soils Investigation and Revegetation Plan for details on seeding methods and species to be planted in the upland areas (H. T. Harvey & Associates 2011a).

Seeding Methods

All disturbed soils within the footprint of anticipated wetland habitat on the Diefenderfer Property will be broadcast or hydro seeded with the native wetland seed mix shown in Table 5. Seeding will occur in the fall, following wetland construction and prior to the onset of the winter wet season. If broadcast seeding is employed, the seed will be manually raked into the upper ¼

inch of soil. After seeding, a layer of clean, weed-free straw (and tackifier) or similar material will be applied to minimize erosion and provide protection until germination occurs.

Measures to Avoid Impacts to Special-Status Species and Regulated Habitats during Construction

To ensure that soil disturbance is minimized, and impacts to special-status species and regulated habitats are avoided, an existing farm road will be used to access the area. However, it will be necessary to establish additional access routes from the existing road to construct the wetlands. The entire work area will be enclosed with Environmentally Sensitive Area Fencing (orange construction fencing) to ensure the construction disturbance is limited to the approved mitigation area.

IMPLEMENTATION SCHEDULE

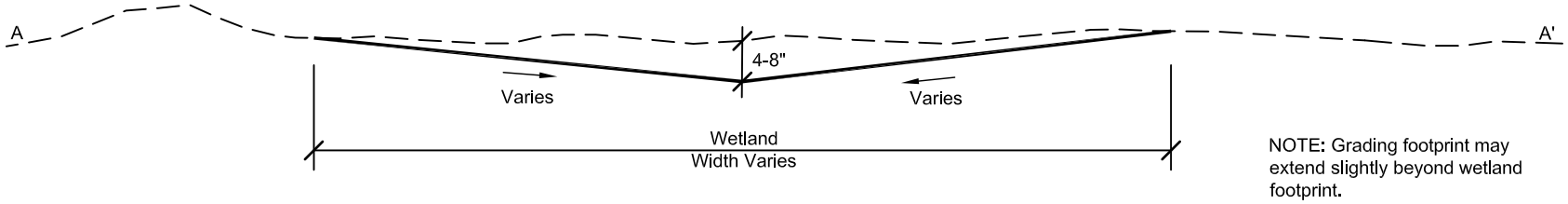
Implementation of the wetland mitigation-site construction is anticipated to occur in Fall 2011 during the same year as the impacts are incurred to minimize temporal loss of habitat and time restoration coincident with regional precipitation patterns. The anticipated approximate schedule for wetland mitigation construction is detailed in Table 5.

Table 5. Mitigation Approximate Implementation Schedule[1]

ACTIVITY	SCHEDULE
Site preparation and construction	Fall 2011
Seeding	Fall 2011; post-construction

[1]The schedule does not indicate the duration of work, but rather the likely windows when the work would occur.

Supplemental wetland seeding may occur ~1 year following the initial seeding if germination and establishment of the initial seeding effort are considered poor.



Section A: Conceptual Wetland Cross Section

Legend

Existing Grade
(Elevation Varies +/- 6")

Proposed Grade

Scale

1 inch = 40 feet

0 40 feet

California Valley Solar Ranch
CVSR Project Site, Off-site Wetland Mitigation and Monitoring Plan
Figure 4: Conceptual Wetland Cross Section

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MAINTENANCE PLAN

WETLAND MITIGATION

Overview

This section outlines maintenance required for the wetland mitigation areas on the Diefenderfer Property. Maintenance will include invasive plant control. Monitoring data (as outlined by requirements discussed in the Monitoring Plan) collected by a qualified restoration ecologist will be used to evaluate the success of the wetland mitigation sites and guide maintenance recommendations to increase the likelihood of site success.

Invasive Plant Control

Because the Diefenderfer Property has been dryland farmed for many years and is currently relatively free of many regionally widespread weed species, active invasive plant control will be required. Minimizing the extent to which weed species invade will require the implementation of rigorous weed control. Refer to the CVSR Weed Control Plan for details on weed control methods (H. T. Harvey 2011b). The wetland mitigation areas will be maintained free of invasive plants (e.g., bindweed [*Convolvulus arvensis*], black mustard [*Brassica nigra*], yellow star thistle [*Centaurea solstitialis*]) to the extent possible for it to function properly as a wetland. A qualified ecologist will assess the type, distribution and abundance of invasive plant species and, when warranted, recommend control measures. The applicant will then be responsible for controlling plant species that could negatively affect site performance. Chemical (approved by the Environmental Protection Agency for use in aquatic environments), mechanical and establishment of competitive vegetation measures may be used to control non-native, invasive species if they are precluding growth and establishment of native wetland species.

Maintenance Schedule

Vegetation maintenance will generally occur a minimum of once per year between April and July prior to peak standing crop and seed dispersal by undesirable species and prior to the beginning of the winter wet season. Additional maintenance activities may be required in any given year based on site conditions as assessed by a qualified restoration and/or rangeland ecologist.

MONITORING PLAN

INTRODUCTION

The overarching goal of this wetland mitigation project is to establish a minimum of 0.63 ac of wetland habitat on the Diefenderfer Property. This monitoring plan defines the objective, measurable success criteria that will be used to determine if the mitigation goal is achieved. Ecological monitoring will be conducted by a qualified restoration ecologist. Monitoring data will be collected and compared to success criteria (described below) to evaluate the success of the mitigation. Results from the monitoring program will also provide feedback to inform maintenance to increase the likelihood of successful target habitat establishment.

The wetland mitigation site will be monitored for a 5-year period (Years 1, 2, 3, 4 and 5) during which at least 2 years receiving average or above average precipitation (amount and distribution) show the site meets the success criteria outlined below. As described in more detail in the Monitoring Methods section, prior to Year-1 monitoring, existing wetlands on the adjacent Tabb property will be sampled using the same methodology as described herein to allow for determination of the 75% relative cover success criterion.

CONSTRUCTION MONITORING

An ecologist will monitor the project during construction to confirm that it is consistent with this restoration plan. Areas of active construction will be visited on a regular basis and site visit reports will be generated after all inspections.

Photo-documentation

Permanent photo-documentation points will be established to document as-built conditions and to serve as photo-documentation points during the long-term monitoring period.

BIOLOGICAL AS-BUILT REPORT

The monitoring ecologist will prepare a Biological As-Built Report documenting any significant deviations between the constructed condition of the mitigation sites and the conceptual design presented herein. Deviations that will be documented include changes in the site configuration, site surface area, plant or seed species palette, and seed application rates among others. Future analysis of the sites will be based on this report. The Biological As-Built Report will be submitted to the permitting agencies within 8 weeks of the completion of the mitigation construction. The report will include photo-documentation of the constructed condition.

MAINTENANCE MONITORING

Site visits will be made once every 3 months on average during the maintenance period. Qualitative assessments of the site will be made and reported during these visits. The purpose of monitoring during the growing season is to assess the overall performance of the vegetation, the adequacy of vegetation maintenance, and the potential need for any remedial earthwork measures. Assessment of the following factors will be made during maintenance monitoring site

visits:

- Vegetation establishment with special attention paid to areas lacking vegetation
- Plant species composition
- Invasion of mitigation sites by invasive, non-native weeds
- Hydrologic, topographic, and soils conditions with particular attention paid to site damage, erosion, or other problems that may necessitate remedial earthwork measures

LONG-TERM SUCCESS CRITERIA

This section provides the success criteria for the wetland mitigation site that will be applied during a minimum 5-year monitoring period. Quantitative measurements will be compared to the criteria outlined below to determine the extent to which the mitigation area is developing the target wetland habitat functions and values. The project goal is to achieve a minimum of 0.63 ac of new wetland habitat meeting all of the criteria described below by the fifth year following construction.

Hydrophytic Vegetation Cover

The final vegetation cover success criterion is based on interpretation of Condition of Approval #40 as confirmed by the County (see Attachment 1 of HRRP). Starting in Year 2 and assuming average precipitation (amount and distribution), restored wetland habitat vegetation cover will total 75% relative cover when compared to existing vegetation cover present in wetlands on the Tabb property. This percentage shall include no more than a 10% non-native component, with the exception of red-stemmed filaree and intentionally or naturally seeded non-native grasses (e.g. *Lolium*) that occurred in the area prior to site disturbance. Hydrophytes will either account for 75% of total vegetation cover by dominant species, or dominant hydrophytic species will provide greater than 50% relative vegetation cover (which includes both upland and hydrophytic plants). For purposes of monitoring development of hydrophytic vegetation, dominants are defined as the most abundant species that either individually or collectively account for more than 50% of the total coverage of vegetation, plus any other species that account for at least 20% of the total relative plant cover.

Hydric Soils Characteristics

The mitigation sites must show a trend towards the development of hydric soil characteristics (acknowledging that many such characteristics take a decade to many hundreds of years to develop, including hydric soil redoximorphic features, buried organic matter, organic streaking, reduced soil conditions, gleyed or low-chroma soils, or sulfidic odor). This will be monitored by assessing saturated soil conditions within the upper soil profile of the restored wetlands, as measured by direct observation of inundation and saturation, redox potential or using an alpha-alpha dipyridyl iron reduction test. The saturated soil condition must be present for a total of between 9 to 25 days each growing season, in years receiving at least average precipitation. The 9 to 25 day duration is based on a 175 to 200 day reported growing season (NRCS Soil Survey 2001) and the required 5 to 12.5% of the growing season needed to exhibit “irregularly inundated or saturated soil” (Environmental Laboratory 1987).

Wetland Delineation

Assuming average precipitation, the surface area of regulated wetland habitat will be confirmed by conducting a wetland delineation in Year-3 in accordance with the USACE Wetland Delineation Manual (Environmental Training Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (USACE 2008). If the required wetland mitigation area is not achieved in Year-3, the delineation will be repeated in successive years, if necessary, to confirm the mitigation requirement has been met. If by Year-5 (assuming at least 2 years of average rainfall during the 5 year monitoring period) the site is not providing the required wetland mitigation acreage, the site will be assessed and remedial measures will be developed.

Rainfall Considerations

Below average rainfall is a common occurrence in the Carrizo Plain, given its geographic location in a significant rainshadow. Therefore, in years with below average precipitation (amount and distribution) the following exceptions are provided:

1. The vegetation data collected will be used to document site conditions and trends in vegetation establishment but the mitigation sites will not be held to the success criterion outlined above.
2. The monitoring of a trend towards hydric soil characteristics will be postponed until a year of average or above average rainfall.
3. If a wetland delineation is scheduled it will be postponed until a year of average or above average rainfall.

During the monitoring period, the site must meet the vegetation and soil saturation success criteria in at least two years receiving average or above average precipitation (amount and distribution). The wetland delineation during at least one year receiving average or above average precipitation must show the site is providing a minimum of 0.63 ac of wetland habitat. If average or above average rainfall does not occur during the 5-year monitoring period, monitoring will continue until suitable rainfall occurs and the site meets the success criteria.

MONITORING METHODS

Wetland Habitat

Wetland Plant Community Composition and Cover. Percent cover by upland and wetland plants will be quantified throughout the mitigation area using the quadrat method after Bonham (1989). Individual samples will be taken from stratified, random locations using a one-m^2 quadrat. The percent cover of each species occurring within each quadrat will be visually estimated to the nearest 5 %. The wetland indicator status of each species will be determined, as well as each species categorized as native, acceptable non-native, or pest weed, as defined in the CVSR Weed Control Plan (H. T. Harvey & Associates 2011b). This documentation will be used to determine the hydrophytic vegetation cover, as well as, identify the need for invasive species to be controlled during maintenance activities. The number of quadrats employed will be based on the variability of the site's vegetation cover, and will be determined by evaluating the average

cover value of wetland indicator species obtained over an increasing number of quadrats. The number of quadrats used will be the point where additional samples do not substantially change the average cover value obtained (Kershaw 1973). Initially, a minimum of 50 quadrats (~ 2 % of the surface area) will be sampled. Prior to Year-1 monitoring of the mitigation wetlands, existing wetlands on the Tabb property, which is underlain by the same soil type and was used as a reference site for designing the mitigation pools, will be sampled using the same methodology as described to allow for determination of the 75% relative cover success criterion.

Trend Towards Development of Hydric Soil Characteristics. Per the success criteria described above, trends toward development of hydric soil characteristics will include demonstration of saturated soil conditions as measured by direct observation of inundation and saturation, redox potential, oxidized rhizosphere, or an alpha-alpha dipyridyl iron reduction test. A qualified restoration ecologist shall conduct site visits as needed during the winter wet season to document the number of days the mitigation wetlands support ponding and/or saturated soil conditions. In addition, the footprint of ponded area and/or saturated soils will be mapped using a Global Positioning System (GPS) unit.

Wetland Delineation. In Year-3, the wetland mitigation site will be examined to determine if it meets the technical criteria for wetland habitat according to the USACE Wetland Delineation Manual (Environmental Training Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (USACE 2008). Delineation of the site's wetlands will continue annually, if needed until the site develops the target acreage.

Photo-documentation. Photographs of the wetland mitigation-site will be taken from fixed locations. Photographs will also be taken to record any event(s) with the potential to significantly affect the success of the mitigation, including flooding and general vandalism.

MONITORING SCHEDULE

Data will be collected each year at approximately the same time each year to standardize results but may be adjusted, as needed, to account for seasonal variations in vegetation conditions, precipitation frequency and distribution, temperature, etc. Table 6 provides an overview of the monitoring schedule.

Table 6. Monitoring Schedule

MONITORING ELEMENT	YEAR-1	YEAR-2	YEAR-3	YEAR-4	YEAR-5
Wetland plant community composition and cover	X	X	X	X	X
Trend towards development of hydric soil characteristics	X	X	X	X	X
Wetland delineation			X	X (if needed)	X (if needed)
Photo-documentation	X	X	X	X	X

REPORTING

Annual ecological monitoring reports will be submitted to the permitting agencies, including San Luis Obispo County (County), the California Department of Fish and Game (CDFG), and the United States Fish and Wildlife Service (USFWS) by 31 December of each monitoring year. Each report will describe the mitigation project, evaluate the site's overall performance relative to success criteria, and provide maintenance recommendations. Maintenance and monitoring will cease upon the attainment of the project-specific success criteria (as described above).

PERMITTING AGENCY SIGN-OFF

The applicant will submit a final monitoring report to the permitting agencies, including the County, CDFG, and USFWS, documenting that the final success criteria have been met and requesting that the agencies issue written "sign-off" acknowledging the mitigation has been met and that ecological monitoring and reporting is complete and may cease.

REFERENCES

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APPENDIX A.
SOIL ANALYSIS RESULTS

ERRATA SHEET FOR APPENDIX A

Diefenderfer Property			
JOB #	**PAGE**	**READS (SAMPLE ID)**	**READS (IN TEXT)**
Off-site Mitigation	2 of 7	D310.4 12”	1.1
Off-site Mitigation	2 of 7	D310.4 24”	1.2
Off-site Mitigation	1 of 7	D310.3 12”	2.1
Off-site Mitigation	1 of 7	D310.3 24”	2.2
Off-site Mitigation	2 of 7	D310.5 12”	3.1
Off-site Mitigation	2 of 7	D310.5 24”	3.2
Off-site Mitigation	2 of 7	D310.6 12”	4.1
Off-site Mitigation	2 of 7	D310.6 24”	4.2
3103-04-30	2 of 2	Group 1: Diefenderfer Pit #9, 12 “	5.1
3013-04-30	1 of 1	Group 3: Diefenderfer Pit #9, 24”	5.2

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Project : CVSR Mitigation
Job#: Offsite Mitigation

COMPREHENSIVE SOIL ANALYSIS

Report No : **11-188-0060**
Purchase Order : 11-1730
Date Recd : 07/07/2011
Date Printed : 07/14/2011

Sample Description - Sample ID	Half Sat % / TEC	pH / Qual Lime	ECe dS/m	NO_3-N ppm	NH_4-N ppm	PO_4-P ppm	K ppm	Ca ppm	Mg ppm	Cu ppm	Zn ppm	Mn ppm	Fe ppm	Organic % dry wt.	Lab No.
				Sufficiency Factors											
D310.1 12"	17	6.4	0.4	2	3	25	141	1525	507	1.3	0.5	9	14	1.4	29261
	123	None		0.2		1.3	1.1	0.9	2.3	0.9	0.1	0.8	0.3		
D310.1 24"	16	7.1	0.3	4	2	19	50	1554	536	0.9	0.3	4	6	1.1	29262
	126	None		0.2		1.0	0.4	0.9	2.3	0.6	0	0.3	0.1		
D310.2 12"	20	6.7	0.3	0	2	19	177	1887	690	1.2	0.2	7	9	1.4	29263
	158	None		0.1		0.8	0.9	0.8	2.1	0.6	0	0.4	0.1		
D310.2 24"	31	7.5	0.4	0	2	8	111	2600	917	1.0	0.1	2	7	0.9	29264
	213	None		0		0.2	0.4	0.7	2.0	0.4	0	0.1	0.1		
D310.3 12"	23	7.7	0.7	1	1	12	128	2244	724	1.0	0.2	3	4	1.6	29265
	190	Low		0		0.4	0.5	0.7	1.8	0.4	0	0.1	0		
D310.3 24"	29	7.9	4.1	1	2	13	79	2248	893	1.1	0.3	2	6	1.5	29266
	208	Low		0.1		0.4	0.3	0.7	2.0	0.4	0	0.1	0.1		

Saturation Extract Values						SAR	Gravel %		Percent of Sample Passing 2 mm Screen					USDA Soil Classification	Lab No.
									Sand			Silt	Clay		
Ca meq/L	Mg meq/L	Na meq/L	K meq/L	B ppm	SO_4 meq/L		Coarse 5 - 12	Fine 2 - 5	Very Coarse 1 - 2	Coarse 0.5 - 1	Med. to Very Fine 0.05 - 0.5	.002-.05	0-.002		
1.4	0.5	1.4	0.4	0.17	0.6	1.5	0.6	3.6	3.4	4.6	33.6	33.5	24.8	Loam	29261
1.3	0.2	1.7	0.2	0.17	0.5	2.0	2.4	3.1	3.6	4.4	29.6	41.5	20.8	Loam	29262
0.8	0.4	1.2	0.1	0.12	0.4	1.6	0.7	1.3	1.4	2.8	31.4	37.5	26.8	Loam	29263
1.9	0.6	2.5	0.1	0.14	0.7	2.3	0.5	0.8	1.2	1.6	22.8	35.5	38.8	Clay Loam	29264
1.4	0.9	7.0	0.2	0.82	1.8	6.5	0	0.9	1.2	2.6	29.8	41.5	24.8	Loam	29265
10.2	6.9	34.2	0.2	5.11	52.0	11.7	0.4	1.3	1.4	2.8	27.4	43.5	24.8	Loam	29266

Sufficiency factor (1.0=sufficient for average crop) below each nutrient value. N factor based on 200 ppm constant feed. SAR = Sodium adsorption ratio. Half Saturation %=approx field moisture capacity. Nitrogen(N), Potassium(K), Calcium(Ca) and Magnesium(Mg) by sodium chloride extraction. Phosphorus(P) by sodium bicarbonate extraction. Copper(Cu), Zinc(Zn), Manganese(Mn) & Iron(Fe) by DTPA extraction. Sat. ext. method for salinity (ECe as dS/m),Boron (B), Sulfate(SO_4), Sodium(Na). Gravel fraction expressed as percent by weight of oven-dried sample passing a 12mm(1/2 inch) sieve. Particle sizes in millimeters. Organic percentage determined by Walkley-Black or Loss on Ignition.

* LOW , SUFFICIENT , HIGH

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Project : CVSR Mitigation
Job#: Offsite Mitigation

COMPREHENSIVE SOIL ANALYSIS

Report No : **11-188-0060**
Purchase Order : 11-1730
Date Recd : 07/07/2011
Date Printed : 07/14/2011

Sample Description - Sample ID	Half Sat % / TEC	pH / Qual Lime	ECe dS/m	NO_3-N ppm	NH_4-N ppm	PO_4-P ppm	K ppm	Ca ppm	Mg ppm	Cu ppm	Zn ppm	Mn ppm	Fe ppm	Organic % dry wt.	Lab No.
				Sufficiency Factors											
D310.4 12"	23	7.1	0.6	2	3	7	82	1440	575	1.8	0.2	6	6	1.8	29267
	123	None		0.1		0.3	0.5	0.7	2.1	1.1	0	0.4	0.1		
D310.4 24"	23	7.7	1.2	1	2	4	62	1637	809	1.7	0.1	3	4	1.2	29268
	162	None		0.1		0.2	0.3	0.6	2.3	0.8	0	0.1	0.1		
D310.5 12"	21	7.0	0.3	1	1	12	104	1736	603	1.8	0.1	7	7	1.2	29269
	142	None		0		0.5	0.6	0.7	2.0	1.0	0	0.5	0.1		
D310.5 24"	24	7.9	0.4	1	2	9	70	2176	750	1.7	0.5	1	3	1.0	29270
	179	None		0.1		0.3	0.3	0.7	1.9	0.7	0.1	0.1	0		
D310.6 12"	19	7.9	2.0	7	2	11	245	2250	391	1.7	0.3	4	3	1.7	29271
	157	Low		0.2		0.5	1.3	0.9	1.2	0.9	0	0.2	0		
D310.6 24"	25	8.4	4.6	6	2	7	70	1221	379	1.9	0.2	2	5	1.8	29272
	131	Medium		0.2		0.2	0.4	0.6	1.3	1.1	0	0.2	0.1		

Saturation Extract Values						SAR	Gravel %		Percent of Sample Passing 2 mm Screen					USDA Soil Classification	Lab No.
Ca meq/L	Mg meq/L	Na meq/L	K meq/L	B ppm	SO_4 meq/L		Coarse 5 - 12	Fine 2 - 5	Sand: Very Coarse 1 - 2	Sand: Coarse 0.5 - 1	Sand: Med. to Very Fine 0.05 - 0.5	Silt .002-.05	Clay 0-.002		
2.0	1.0	2.3	0	0.30	1.1	1.9	0.1	0.7	3.2	8.8	39.6	31.5	16.8	Loam	29267
2.7	2.0	10.1	0.3	0.39	7.2	6.6	1.1	2.4	4.8	9.0	39.8	21.5	24.8	Sandy Clay Loam	29268
1.2	0.4	1.6	0.2	0.12	0.5	1.8	0.1	0.9	2.6	4.2	38.8	29.5	24.8	Loam	29269
0.8	0.4	2.8	0.2	0.41	1.0	3.6	0.3	1.0	1.6	4.0	44	25.5	24.8	Sandy Clay Loam	29270
8.5	3.0	13.6	0.5	4.31	21.4	5.7	0.6	1.1	1.0	2.8	37.8	39.5	18.8	Loam	29271
3.7	2.1	51.0	0.3	10.30	53.4	30.0	0.1	1.2	1.4	3.0	33.2	37.5	24.8	Loam	29272

Sufficiency factor (1.0=sufficient for average crop) below each nutrient value. N factor based on 200 ppm constant feed. SAR = Sodium adsorption ratio. Half Saturation %=approx field moisture capacity. Nitrogen(N), Potassium(K), Calcium(Ca) and Magnesium(Mg) by sodium chloride extraction. Phosphorus(P) by sodium bicarbonate extraction. Copper(Cu), Zinc(Zn), Manganese(Mn) & Iron(Fe) by DTPA extraction. Sat. ext. method for salinity (ECe as dS/m),Boron (B), Sulfate(SO_4), Sodium(Na). Gravel fraction expressed as percent by weight of oven-dried sample passing a 12mm(1/2 inch) sieve. Particle sizes in millimeters. Organic percentage determined by Walkley-Black or Loss on Ignition.

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Attachment 4

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Project : Diefenderfer Wetland;
California Valley, CA
Job#: 3103-04-30

SOIL APPRAISAL ANALYSIS

Report No : **11-220-0055**
Purchase Order : 11-1924
Date Printed : 08/16/2011
Date Recd : 8/8/2011

Sample Description Sample ID	Half Sat %	pH s.u.	ECe dS/m	Organic Matter %	SAR	Gravel %		Percent of Sample Passing 2mm Screen					USDA Soil Classification	Lab No.
								Sand						
						Coarse 5 - 12	Fine 2 - 5	Very Coarse 1 - 2	Coarse 0.5 - 1	Med. to Very Fine 0.05 - 0.5	Silt .002-.05	Clay 0-.002		
Group 3: Defenderfer Pit #1, 0-12"						0.2	1.4	2.8	6.2	45.2	29.1	16.6	Sandy Loam	29598
Group 3: Defenderfer Pit #1, 12-24"						2.8	2.8	2.7	5.3	42.6	26	23.3	Sandy Clay Loam	29599
Group 3: Defenderfer Pit #2, 12"						3.9	5.2	4.5	8	45.1	28	14.3	Sandy Loam	29600
Group 3: Defenderfer Pit #2, 24"						5	5.9	4.4	7.5	44.7	29	14.3	Sandy Loam	29601
Group 3: Defenderfer Pit #3, 0-12"						1.5	3.4	3.6	7.8	48.8	31.1	8.6	Sandy Loam	29602
Group 3: Defenderfer Pit #3, 12-24"						1.5	3.8	3.8	7.5	42.3	27	19.3	Sandy Loam	29603
Group 3: Defenderfer Pit #4, 0-12"						0.8	1.5	2.8	5.2	38.2	33.1	20.6	Loam	29604
Group 3: Defenderfer Pit #4, 12-20"						0.9	0.9	2.2	5.1	36.3	23	33.3	Clay Loam	29605
Group 3: Defenderfer Pit #4, 20-30"						8.9	7.8	5.5	8.7	44.4	17	24.3	Gravelly Sandy Clay Loam	29606
Group 3: Defenderfer Pit #5, 12"						1.1	2.6	2.4	5.3	39.9	26	26.3	Sandy Clay Loam	29607
Group 3: Defenderfer Pit #5, 24"						0	1.2	1.9	4	35.7	24	34.3	Clay Loam	29608
Group 3: Defenderfer Pit #6, 12"						0.2	0.8	1	1.1	62.5	15	20.3	Sandy Clay Loam	29609
Group 3: Defenderfer Pit #6, 24"						0	0.6	1	1.8	33.8	21	42.2	Clay	29610
Group 3: Defenderfer Pit #7, 0-12"						0.4	1	1.1	1.3	34.2	22	41.2	Clay	29611
Group 3: Defenderfer Pit #7, 12-24"						0.4	1.6	1.6	3	32	20	43.2	Clay	29612
Group 3: Defenderfer Pit #8, 12-24"						0.1	0.4	1.3	2.6	32.7	20	43.2	Clay	29613
Group 3: Defenderfer Pit #9, 24"						0	0.3	0.4	2	34.2	21	42.2	Clay	29614

Half Saturation %= approximate field moisture capacity. Salinity , saturation extract = ECe (dS/m at 25 degree C). Gravel fraction expressed as percent by weight of oven-dried sample passing a 12mm (1/2 inch) sieve. Particle sizes in millimeters.

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Project : Diefenderfer Wetland;
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Job#: 3103-04-30
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COMPREHENSIVE SOIL ANALYSIS

Report No : **11-220-0055**
Purchase Order : 11-1924
Date Recd : 08/08/2011
Date Printed : 08/16/2011
Page : 1 of 1

Sample Description - Sample ID	Half Sat %	pH	ECe dS/m	NO_3-N ppm	NH_4-N ppm	PO_4-P ppm	K ppm	Ca ppm	Mg ppm	Cu ppm	Zn ppm	Mn ppm	Fe ppm	Organic % dry wt.	Lab No.
	TEC	Qual Lime		Sufficiency Factors											
Group 1: Diefenderfer Pit#8, 0-12"	23	6.5	1.5	4	4	26	208	1114	549	3.6	1.1	44	92	1.3	29596
	125	None		0.2		1.0	1.3	0.5	2.0	2.2	0.2	3.2	1.5		
Group 1: Diefenderfer Pit#9, 12"	40	8.1	3.3	23	6	9	108	1147	408	2.4	0.3	6	23	1.5	29597
	140	None		0.4		0.2	0.4	0.5	1.3	1.3	0	0.4	0.3		

Saturation Extract Values						SAR	Gravel %		Percent of Sample Passing 2 mm Screen					USDA Soil Classification	Lab No.
									Sand			Silt	Clay		
Ca meq/L	Mg meq/L	Na meq/L	K meq/L	B ppm	SO_4 meq/L		Coarse 5 - 12	Fine 2 - 5	Very Coarse 1 - 2	Coarse 0.5 - 1	Med. to Very Fine 0.05 - 0.5	.002-.05	0-.002		
1.3	0.6	10.1	4.2	0.59	3.9	10.3	0.1	1.0	2.0	3.4	20.8	43.1	30.6	Clay Loam	29596
1.5	0.8	39.3	1.1	3.65	8.1	36.3	0.1	0.5	0.9	2.7	33	28.0	35.3	Clay Loam	29597

Sufficiency factor (1.0=sufficient for average crop) below each nutrient value. N factor based on 200 ppm constant feed. SAR = Sodium adsorption ratio. Half Saturation %=approx field moisture capacity. Nitrogen(N), Potassium(K), Calcium(Ca) and Magnesium(Mg) by sodium chloride extraction. Phosphorus(P) by sodium bicarbonate extraction. Copper(Cu),Zinc(Zn),Manganese(Mn) & Iron(Fe) by DTPA extraction. Sat. ext. method for salinity (ECe as dS/m),Boron (B), Sulfate(SO_4), Sodium(Na). Gravel fraction expressed as percent by weight of oven-dried sample passing a 12mm(1/2 inch) sieve. Particle sizes in millimeters. Organic percentage determined by Walkley-Black or Loss on Ignition.

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APPENDIX B.
PHOTO-DOCUMENTATION

Image 1. Clay-rich area on the Diefenderfer Property proposed for wetland mitigation within the Chicote complex (NRCS Series 361).

Image 2. An existing wetland on the Tabb Property toward the end of an above-average wet season. Note the relatively sparse vegetation in the bottom of the pool.

Image 3. Wetland on the Tabb Property after all surface water has evaporated. Note the distinct zonation of vegetation in and around the pool. The vegetation in the bottom of the pool is benefiting from at-depth moisture in the moderately heavy clay soil.

Image 4. Wetland complex (pools and scalds) on the Tabb Property. Pools form in the lower elevation depressions and scalds form on the higher-elevation flat areas. Pools are the target habitat feature for proposed wetland mitigation on the Diefenderfer Property.

Image 5. The clayey soils underlying the Diefenderfer and Tabb properties disperse when wet, resulting in ponding and wetland formation.

Image 6. *Lastenia fremontii* in the bottom of a wetland on the Tabb Property. The taller grass in the background is *Hordeum brachyantherum*. A similar *Lastenia spp*. and the *H. brachyantherum* are included in the recommended wetland seed mix for the wetland mitigation areas on Diefenderfer.