

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL COAST REGION**

**INDIVIDUAL WASTE DISCHARGE REQUIREMENTS  
ORDER NO. R3-2012-0006**

Waste Discharger Identification No. 3401011421  
Place No. 775501

**For**

**CALIFORNIA VALLEY SOLAR RANCH  
DISCHARGES OF FILL MATERIAL TO WATERS OF THE STATE  
SAN LUIS OBISPO COUNTY, CALIFORNIA**

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The California Regional Water Quality Control Board, Central Coast Region (Water Board) finds that:

**SITE OWNER AND LOCATION**

1. The High Plains Ranch II, LLC (Discharger) proposes to conduct activities that will result in permanent and temporary impacts to ephemeral drainages, wetlands, and other non-federal waters as part of the California Valley Solar Ranch Discharges of Fill Material to Waters of the State (Project).
2. The Discharger proposes to construct the Project on a portion of an approximately 4,956 acre rangeland property immediately north of the California Valley subdivision at the northeastern fringe of the Carrizo Plain in eastern San Luis Obispo County, as shown in the Exhibit 1 Project Vicinity Map. The Project site is adjacent to the Temblor Range, 56 miles east of San Luis Obispo and 52 miles southeast of Paso Robles. State Route 58 bisects the site, which occurs on the Simmler, Las Yeguas Ranch and McKittrick Summit United States Geological Survey quadrangles. 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. The Project site occurs within the Carrizo Plain Hydrologic Unit as described in the 1994 Water Quality Control Plan for the Central Coast Region (Basin Plan). Surface water at the Project site drains to the south and forms Soda Lake, which is approximately three miles to the south.

**PURPOSE OF ORDER**

3. On April 11, 2011, H.T. Harvey and Associates on behalf of the Discharger submitted a Report of Waste Discharge (ROWD) for Waste Discharge

Requirements (WDRs) to the Water Board for permanent and temporary impacts and discharges of fill associated with the Project to ephemeral drainages, wetlands, and non-federal waters.

4. On August 12, 2011 the Discharger submitted an amendment to the ROWD that included significant changes to the Project description as proposed on April 11, 2011 (i.e. change in crossing locations, solar array tracker footings in additional drainages, installation of security fencing in seven drainages, and an increase in expected impacts to wetlands).
5. The U.S. Army Corps of Engineers (USACE) disclaimed all waters on the Project site as waters of the United States per a letter dated December 6, 2010 (Exhibit 2). The Project is, therefore, subject to permitting from the State, but not the USACE.
6. The proposed Project is a 250-megawatt (MW) solar photovoltaic (PV) energy plant. The Project consists of several components, including photovoltaic panels set on screw or helical pile supports, solar array pier footings, perimeter fire access roads, watercourse road crossings, maintenance roads, voltage collection lines, a substation, a switchyard, an operations and maintenance building, a visitor center, parking areas, security fencing, water tank, and lighting.
7. Project activities with the potential to discharge to waters of the State shown in Exhibit 3 include nine individual road crossings, seven permanent and two temporary, over eight ephemeral drainages; placement of fifty-one pier footings spread over two ephemeral drainages and three wetlands; filling a man-made pond located in an abandoned gypsum mine; and array security fencing and utility trenching through ephemeral drainages. The direct, permanent impacts to the ephemeral drainages associated with the Project include 0.03 acres due to 29.76 cubic yards of fill over 223.4 linear feet. The direct, permanent impacts to wetlands associated with the Project, is the loss of 0.13 acres due to 0.18 cubic yards of fill and 5662 ft<sup>2</sup> of shading. The direct permanent impacts to other waters of the State are 0.13 acres due to 213 cubic yards of fill. Direct temporary impacts related to construction of permanent ephemeral drainage crossings, pier footings, array security fencing, and two temporary crossings total 0.02 acres due to 5.4 cubic yards of fill over 256 linear feet. Total project impacts consist of 0.29 acres of permanent impacts and 0.02 acres of temporary impacts.

#### **CALIFORNIA ENVIRONMENTAL QUALITY ACT**

8. The County of San Luis Obispo certified the Final Environmental Impact Report for the California Valley Solar Project on April 20, 2011, and filed a Notice of Determination on April 20, 2011, in compliance with the California

Environmental Quality Act (Public Resources Code, § 21000, et seq.) in accordance with Title 14, Chapter 3, and § 15301.

### **BASIN PLAN**

9. The Basin Plan was adopted by the Water Board on September 8, 1994, and approved by the State Water Resources Control Board (State Water Board) on November 17, 1994. The Basin Plan incorporates statewide plans and policies by reference and contains a strategy for protecting beneficial uses of State Waters. This Order implements the water quality standards stated in the Basin Plan.
10. Unnamed blue line streams drain the Project area and flow to Soda Lake. The Basin Plan identifies the following present and anticipated beneficial uses of Soda Lake:
  - a. Industrial Process Supply;
  - b. Non-contact water recreation;
  - c. Wildlife habitat;
  - d. Warm fresh-water aquatic habitat;
  - e. Preservation of biological habitats of special significance;
  - f. Rare, threatened, or endangered species;
  - g. Commercial and sport fishing.

### **ACTIVE CONSTRUCTION STORM WATER DISCHARGES**

11. Construction activities associated with the proposed discharges of fill have the potential to threaten beneficial uses on-site and downstream. On August 10, 2011, the Discharger filed a Notice of Intent with the State Water Board for coverage under State Board Order No. 2009-0009-DWQ (amended November 14, 2010 as Order No. 2010-0014-DWQ), *National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated With Construction and Land Disturbance Activities (General Permit)*. On August 11, 2011, the State Water Board enrolled the California Valley Solar Ranch under the General Permit. The Project's Waste Discharge Identification (WDID) number for construction activities is 340C361667 and the combined calculated Project Receiving Water Risk and Project Sediment Risk Level is 1. The Water Board may conduct inspections to verify compliance with Order No. 2010-0014-DWQ, including, but not limited to, implementation of a storm water pollution prevention plan.

### **WETLANDS CONSERVATION AND MITIGATION**

12. Executive Order W-59-93, dated August 23, 1993, establishes a California Wetlands Conservation Policy including an objective to ensure no overall net loss of and a long term net gain in the quantity, quality, and permanence of wetland acreage and value in California ("No Net Loss Policy").

13. Filling wetlands, riparian areas, headwaters, and other waters causes partial or complete loss of the beneficial uses provided by those waters. To reconcile such losses with the "No Net Loss" requirements of Executive Order W-59-93 and the "Antidegradation" requirements of State Water Board Resolution No. 68-16, this Order requires the Discharger to implement a mitigation plan to ensure that Project impacts are mitigated through avoidance and minimization, and that unavoidable loss of beneficial uses is offset with appropriate compensatory mitigation, including restoration and preservation of other waters of the state. These mitigation requirements are consistent with those adopted by the U.S. Environmental Protection Agency and the ACOE for regulation of dredged or fill discharges to federal waters under CWA § 404.
14. This Order specifies waste discharge requirements that are necessary to adequately address effects on, and threats to, water quality standards resulting from discharges of waste and the filling of waters of the State; to meet the objectives of the State Wetlands Conservation Policy (Executive Order W-59-93); to be consistent with antidegradation provisions of State Water Board Resolution No. 68-16; and to accommodate and require appropriate changes during implementation of the Project and its construction. Through adherence to the waste discharge requirements, the Project, as described in this Order, will not result in violation of State water quality standards.
15. For purposes of this Order, restoration is defined as the creation of waters of the State where they previously occurred (e.g., removal of fill material to restore a streambed). Preservation is defined as protecting existing wetlands from destruction from future land use or development (e.g. conservation easement, deed restriction, permanent habitat reserve, etc.)
16. The *California Valley Solar Ranch Project Off-Site Wetland Mitigation and Monitoring Plan, August 24, 2011* (Mitigation Plan) in Exhibit 4 will adequately compensate for impacts to waters of the State associated with the discharge of fill material.
17. The mitigation site has soils and hydrology suitable for wetland restoration, and with an active revegetation, monitoring, and maintenance effort, functional and naturally sustained seasonal wetlands will be established on the sites within 3-5 years. The proposed wetland restoration will have the landscape scale ecological benefit of increasing the acreage of wetland habitat on the Carrizo Plain.

**GENERAL FINDINGS**

18. Section 13260(a) of the California Water Code (CWC) requires that any person discharging waste or proposing to discharge waste within any region, other than to a community sewer system, which could affect the quality of the waters of the State<sup>1</sup>, file a ROWD. The discharge of dredged or fill material constitutes a discharge of waste that could affect the quality of waters of the State.
19. CWC § 13263(a) requires that WDRs be prescribed as to the nature of any proposed discharge, existing discharge, or material change in an existing discharge. Such WDRs must implement any relevant water quality control plans, taking into consideration beneficial uses to be protected, the water quality objectives reasonably required for those purposes, other waste discharges, the need to prevent nuisance, and the provisions of § 13241 of the California Water Code.
20. On November 3, 2011, the Water Board notified the Discharger and interested agencies and persons of its intention to issue the Individual WDRs and has provided an opportunity to review a copy of the proposed Order and submit views and comments.
21. The Water Board, in a public meeting held on February 1-2, 2012, heard and considered all comments pertaining to the proposed discharge.

**ORDER**

**IT IS HEREBY ORDERED THAT**, High Plains Ranch II, LLC, in order to meet the provisions contained in Division 7 of the CWC and Regulations adopted thereunder, must comply with the following requirements:

**PROHIBITIONS**

1. The discharge of waste in a manner other than as described in the April 20, 2011 Final Environmental Impact Report for the California Valley Solar Project, Report of Waste Discharge (ROWD), amendments to the ROWD, findings of this Order, or in the August 24, 2011 California Valley Solar Ranch Project Off-Site Wetland Mitigation and Monitoring Plan is prohibited unless the Discharger obtains revised waste discharge requirements that provide for the proposed change prior to the discharge occurring.

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<sup>1</sup> Waters of the State means any surface water or groundwater, including saline waters, within the boundaries of the state.

2. The discharge of fill material and waste in a manner that has not been described in the ROWD, and for which valid waste discharge requirements are not in force, is prohibited.
3. The discharge of waste shall not create a condition of pollution, contamination, or nuisance, as defined by § 13050 of the CWC.
4. The discharge shall not directly or indirectly destabilize a channel or bed of a receiving water.
5. The discharge, as mitigated, shall not cause significant adverse environmental impacts.
6. The discharge shall not cause in combination with other discharges a significant cumulative adverse effect on water quality or beneficial uses of the waters of the State including, but not limited to, wetlands and headwaters.
7. Discharges to surface waters of wastes or pollutants that are not otherwise regulated by separate National Pollutant Discharge Elimination System (NPDES) requirements or WDRs are prohibited.
8. The discharge of waste classified as “hazardous” or “designated” as defined in Title 22, § 66261 of the CCR, or CWC § 13173, is prohibited.
9. The discharge of sand, silt, clay, or other earthen materials from any activity in quantities which cause deleterious bottom deposits, turbidity, or discoloration in waters of the State or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.
10. The unauthorized discharge of treated or untreated sewage to waters of the State or to a stormwater conveyance system is prohibited.
11. The dumping, deposition, or discharge of waste directly into waters of the State, or adjacent to such waters in any manner which may permit it being transported into the waters, is prohibited unless authorized by the Water Board or State Water Board.

## **PROVISIONS**

### *General*

12. The Discharger must comply with all conditions of this Order. Violations may result in enforcement actions, including Water Board orders or court orders requiring corrective action or imposing civil monetary liability, or in modification or revocation of these waste discharge requirements by the

Water Board. (CWC § 13261, § 13263, § 13265, § 13267, § 13268, § 13300, § 13301, § 13304, § 13330, § 13340, § 13350, and 23 CCR § 3867).

13. The Discharger must comply with the Basin Plan provisions, including maintaining the protection of beneficial uses and complying with any prohibitions and water quality objectives governing the discharge. In the event of a conflict between the provisions of this Order and the Basin Plan, the more stringent provisions prevail.

#### *Construction Activities*

14. The Discharger must comply with the requirements of State Board Order No. 2010-0014-DWQ National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002, *General Permit for Storm Water Discharges Associated With Construction and Land Disturbance Activities*.
15. The Discharger must notify the Water Board in writing within ten (10) days following the initiation of discharge of fill to on-site waters of the State.
16. During construction activities within waters of the State, adequate erosion control measures must be kept on site and immediately available for installation. If the National Weather Service predicts a 25% or more chance of rain within 24 hours, all construction activities within waters of the state must cease and the site manager must install effective erosion and sediment control measures. Construction activities in waters of the State may commence and/or resume after the rain event has passed and site conditions are dry enough to work without additional risk of discharging to waters of the State.
17. The Discharger must confine all trash and debris in appropriate enclosed bins and dispose of the trash and debris at an approved site at least weekly.
18. The Discharger must design and construct all impervious surfaces to sheet flow runoff to vegetated, naturally contoured areas. Impervious surfaces must not directly discharge to or be directly connected to any waters of the State.
19. Any proposed change in construction that may alter flow patterns and/or change the approved impact footprint is prohibited without Water Board approval. Not later than thirty (30) days prior to the beginning of any proposed change, the Discharger must submit, for approval by Water Board staff, detailed plans and specifications showing the proposed change in relationship to the approved project.
20. Fueling, lubrication, maintenance, operation, and storage of vehicles and equipment may not result in a discharge or a threatened discharge to water



bodies. At no time may the Discharger use vehicles or equipment that leaks any substance that might impact water quality. Staging and storage areas for vehicles and equipment must be located at least 100 feet outside of waters of the State.

21. The Discharger must, at all times, maintain appropriate types and sufficient quantities of materials onsite to contain any spill or inadvertent release of materials that may cause a condition of pollution or nuisance if the materials reach waters of the State.
22. All construction-related equipment, materials, and any temporary BMPs no longer needed must be removed and cleaned from the site upon completion of the project.

#### *Site Management*

23. During the construction and operational phases of the Project, the Discharger or personnel applying herbicides must have all the appropriate State and local herbicide applicator licenses and comply with all State and local regulations regarding herbicide use. The Discharger must mix herbicides and apply them in conformance with the product manufacturer's directions. The Discharger must use products identified as non-toxic to birds and small mammals near nests or dens, and the Discharger must not apply herbicides within fifty feet of any surface waterbody when water is present. The Discharger must not apply herbicides if the National Weather Service predicts a 25% or more chance of rain within 24 hours, the target area has puddles or standing water, or when wind velocity exceeds ten miles per hour. If the Discharger observes spray to be drifting to a non-target location, the Discharger must discontinue spraying until conditions causing the drift have abated.
24. Dewatering and stream diversion measures are not authorized. The Discharger must submit detailed dewatering or diversion plans for Water Board staff review and approval at least fifteen-days prior to any dewatering or diversion.

#### *Mitigation*

25. The Discharger must implement the *California Valley Solar Ranch Project Off-Site Wetland Mitigation and Monitoring Plan, August 24, 2011* in Exhibit 4. Vegetation maintenance shall occur a minimum of once per year during the monitoring and maintenance period until all success criteria are achieved.
26. Mitigation shall achieve restoration of a minimum of 0.63 acres of wetland habitat meeting all of the success criteria described in the *California Valley*

*Solar Ranch Project Off-Site Wetland Mitigation and Monitoring Plan, August 24, 2011* by the fifth year following construction. The minimum required restoration to impact ratio for the permanently and temporarily impacted ephemeral drainages, wetlands, and other waters associated with the Project is of 2:1. If mitigation measures do not meet their interim or ultimate success criteria, the discharger shall implement remedial measures that are acceptable to the Water Board's Executive Officer until such time the interim or ultimate success criteria is met.

27. All areas of temporary impacts to waters of the State shall be restored to pre-existing conditions or conditions of improved habitat value and function. Restoration of areas of temporary impacts shall be conducted in a manner consistent with the wetland mitigation, monitoring, maintenance, and schedules identified in the *California Valley Solar Ranch Project Off-Site Wetland Mitigation and Monitoring Plan, August 24, 2011*.
28. The preparation of proposed mitigation areas must be concurrent with (or prior to) the discharge of fill material into waters of the State. The Discharger must complete installation of mitigation no later than nine months following the discharge of fill into on-site waters of the State. Delays in implementing mitigation will result in increased mitigation requirements by 0.01 acre for each month of delay.
29. If at any time during the implementation and establishment of planted or graded mitigation area(s), and prior to verification of meeting success criteria, a catastrophic natural event (e.g. fire, flood) occurs and impacts the mitigation area, the Discharger is responsible for repair and replanting of the damaged area(s).
30. The Discharger shall manage the preserve areas within the Project area boundaries in perpetuity for special-status plant and wildlife habitat, with a dedicated grazing management plan and weed control plan.
31. Within ninety (90) days of the issuance of this Order, the Discharger must provide the Water Board's Executive Officer a draft preservation mechanism (e.g. deed restriction, conservation easement, etc.) that will protect all mitigation areas and their buffers in perpetuity. The conservation easement or other legal limitation on the mitigation property must be adequate to demonstrate that the site will be maintained without future development or encroachment on the site. The conservation easement or other appropriate legal limitation must prohibit, without exception, all residential, commercial, industrial, institutional, and transportation development, and any other infrastructure development that would not maintain or enhance the wetland functions and values of the site. Other infrastructure development to be prohibited includes, but is not limited to, additional utility lines, paved maintenance roads, and areas of maintained landscaping for recreation.

32. No plant species on the most recent California Invasive Plant Council (Cal-IPC) List, "Exotic Pest Plants of Greatest Ecological Concern in California"<sup>2</sup> may be planted in mitigation areas, waters of the State, vegetated stormwater BMP areas, or other areas used to convey urban runoff and stormwater.
33. The Discharger must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

#### *Monitoring*

34. The Discharger shall comply with Monitoring and Reporting Program No. R3-2012-0006 (included as part of this Order), as ordered by the Executive Officer.

#### *Site Access and Information Requirements*

35. The Discharger must allow the Water Board, or an authorized representative, upon the presentation of credentials and other documents, as may be required by law, to do the following:
  - a. Enter upon the premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Order;
  - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order;
  - c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order;
  - d. Sample, photograph, and monitor at reasonable times, for the purpose of assuring compliance with this Order.
36. The Discharger must furnish, within a reasonable time, any information the Water Board may request to determine whether cause exists for modifying, revoking and reissuing, or terminating coverage under this Order. The Discharger must also furnish to the Water Board, upon request, copies of records required to be kept by this Order.
37. The CWC provides that any person failing or refusing to furnish technical or monitoring program reports, as required under this Order, or falsifying any information provided in the monitoring reports, is subject to civil liability for each day in which the violation occurs.

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<sup>2</sup> The Cal-IPC list may be found on-line at <http://www.cal-ipc.org/>.

38. All reports, notices, or other documents required by this Order or requested by the Water Board must be signed by a responsible corporate officer such as (1) a president, secretary, treasurer, or vice president of High Plains Ranch II, LLC in charge of a principal business function; (2) any other person who performs similar policy or decision-making functions for High Plains Ranch II, LLC; or (3) the manager of one or more manufacturing, production, or operating facilities if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures; or (4) by a duly authorized representative of that person.

Any person signing a document under this Order or the associate Monitoring and Reporting Program must make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

39. After notice and opportunity for a hearing, discharges under this Order may be terminated or modified for cause, including, but not limited to, the following:
- a. Violation of any term or condition of this Order;
  - b. Obtaining this Order by misrepresentation or failure to disclose all relevant facts;
  - c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

#### *Standard Provisions*

40. This Order is not transferable to any person except after notice to the Water Board. In accordance with CWC § 13260, the Dischargers must file with the Water Board a report of any material change or proposed change in the ownership, character, location, or quantity of this waste discharge. The notice must include a written agreement between the existing and new dischargers containing a specific date for the transfer of this Order's responsibility and coverage between the current Discharger and the new discharger. This agreement must include an acknowledgment that the existing Discharger is liable for violations up to the transfer date and that the new discharger is liable from the transfer date on. The Water Board may require modification or revocation and reissuance of this Order to change the name of the dischargers and incorporate such other requirements as may be necessary under the CWC.

41. Any proposed material change in operation must be reported to the Water Board at least thirty (30) days in advance of the proposed implementation of any change. This must include, but not be limited to, all significant new soil disturbances, all proposed expansion of development, or any change in drainage characteristics at the project site. For the purpose of this Order, this includes any proposed change in the boundaries of the wetland/waters of the State fill sites. The Water Board may require modification or revocation and reissuance of this Order to change any requirements in this Order and incorporate such other requirements as may be necessary under the CWC.
42. The Discharger must maintain a copy of this Order at the project site so as to be available at all times to site operating personnel and agencies.
43. This Order does not authorize commission of any act causing injury to the property of another or of the public; does not convey any property rights; does not remove liability under federal, state, or local laws, regulations or rules of other programs and agencies, nor does this Order authorize the discharge of wastes without appropriate permits from other agencies or organizations.
44. The Water Board will consider rescission of this Order upon notification of successful completion of mitigation for all creation, restoration, and enhancement projects required or otherwise permitted now or subsequently under this Order, completion of project construction, and the Water Board's acceptance of these notifications.
45. The filing of a request by the Discharger for the modification, revocation and reissuance, or termination of this Order, or notification of planned changes or anticipated noncompliance does not stay any condition of this Order.

## **NOTIFICATIONS**

46. All information requested by the Water Board is pursuant to CWC § 13267. Civil liability may be administratively imposed by the Water Board for failure to furnish requested information pursuant to CWC § 13268.
47. These requirements have not been officially reviewed by the United States Environmental Protection Agency and are not issued pursuant to § 402 of the Clean Water Act.
48. The provisions of this Order are severable, and if any provision of this Order, or the application of any provision of this Order to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this Order, shall not be affected thereby.

**CERTIFICATION**

This Order becomes effective on the date of adoption by the Water Board.

I, Roger W. Briggs, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Coast Region, on February 2, 2012.


A handwritten signature in black ink, appearing to read "Roger W. Briggs". The signature is fluid and cursive, with the first name "Roger" being more prominent than the last name "Briggs".

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Roger W. Briggs  
Executive Officer



**Legend**

 Biological Study Area Boundary

Data Sources: [1] California Geospatial Information Library, [2] ESRI BaseMap USA (2005).

**Scale**

1:780,000  
1 inch = 65,000 feet


0 12.3 Miles

0 32,500 65,000 Feet

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

**California Valley Solar Ranch**  
RWQCB CVSR Waste Discharge/  
NPDES Permit  
Figure 1: Project Vicinity Map

**HPR II**

 **H.T. HARVEY & ASSOCIATES**  
ECOLOGICAL CONSULTANTS

M:\Projects\3000\3103-0102\_Phase1\Reports\RWQCB\_NPDES\_Permit

REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS  
1455 MARKET STREET  
SAN FRANCISCO, CALIFORNIA 94103-1398

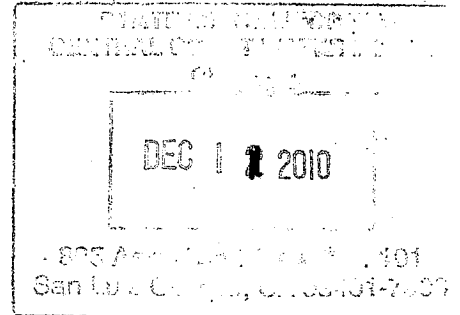
Regulatory Division

SUBJECT: File Number 2010-00021S

SunPower Corporation Systems  
Attn: Renee Robin  
1414 Harbour Way South  
Richmond, California 94804

Dear Ms. Robin:

DEC 06 2010



This letter is in regard to your request dated March 26, 2010, concerning Department of the Army authorization for plans to conduct the California Valley Solar Ranch Project, on a 4,365 acre site bisected by State Route 58 and bounded by the California Valley subdivision to the South (approximate center of project: 35.32885 N, -119.90547 W), in San Luis Obispo County, California.

We have determined that there are no waters of the U.S. as defined by Section 404 of the Clean Water Act and no navigable waters of the U.S. as defined by Section 10 of the Rivers and Harbors Act of 1899 within the boundaries of the project site shown in the attached delineation map for your project. Therefore, a Department of the Army authorization will not be required to complete the activity you are proposing.

We have determined that construction of your project will not involve the discharge of fill materials into regulated waters of the United States pursuant to the U.S. Supreme Court decision in Solid Waste Agency of Northern Cook County (SWANCC) v. U.S. Army Corps of Engineers, 531 U.S. 159 (2001). The SWANCC identified water bodies are not "waters of the United States" because they are: (1) not navigable waters, (2) not interstate waters, (3) not part of a tributary to item (1) or (2), (4) not wetlands adjacent to any of the foregoing waters, or (5) not an impoundment of any of the foregoing waters. In addition, the interstate commerce nexus to these particular waters is insufficient to establish Clean Water Act jurisdiction. These waters are therefore not subject to regulation by the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act.

This approved jurisdictional determination is presumed to be consistent with the U.S. Supreme Court decision of June 19, 2006, concerning *Rapanos v. United States*, 126 S. Ct. 2208 (2006) ("Rapanos"). In the Rapanos decision, the Court determined, in part, that jurisdiction may not be asserted over certain categories of waters that lack a "significant nexus" effect with a traditional navigable waters. Those categories of waters requiring a significant nexus effect determination include: Non-navigable tributaries that are not relatively permanent (do not typically flow year-round or have continuous flow at least seasonally); wetlands adjacent to non-



navigable tributaries that are not relatively permanent; and wetlands adjacent to but not directly abutting a relatively permanent non-navigable tributary.

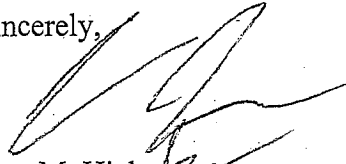
Enclosed is a map labeled "File #2010-00021S – California Valley Solar Ranch," dated November 22, 2010, showing no Corps jurisdiction within the project site. This map, and the determination that a permit is not required for your activity, are based upon on-site inspections of the project by our staff on March 24, 2010, June 30, 2010, August 23, 2010, and October 6, 2010, and our review of the project documents, including the "California Valley Solar Ranch Project, San Luis Obispo County, California; Preliminary Delineation of Wetlands and Other Waters," dated 29 December 2009, and the packages of further information submitted by H.T. Harvey and Associates. This jurisdictional delineation will expire in five years from the date of this letter. However, if there has been a change in circumstances that affects the extent of Corps jurisdiction, a revision may be completed before that date. A change to your project could also change the determination that no permit is required.

You are advised that the Corps has established an Administrative Appeal Process, as described in 33 C.F.R. Part 331 (65 Fed. Reg. 16,486; March 28, 2000), and outlined in the enclosed flowchart and "Notification of Administrative Appeal Options, Process, and Request for Appeal" form (NAO-RFA). If you do not intend to accept the approved jurisdictional determination, you may elect to provide new information to the District Engineer for reconsideration or submit a completed NAO-RFA form to the Division Engineer to initiate the appeal process. You will relinquish all rights to appeal, unless the Corps receives new information or a completed NAO-RFA form within sixty (60) days of the date of the NAO-RFA.

This determination does not obviate the need to obtain other Federal, State or local approvals required by law, including compliance with the Federal Endangered Species Act (ESA) (16 U.S.C. Section 1531 et seq.). Even though this activity is not prohibited by, or otherwise subject to regulation under Section 404, the take of a threatened or endangered species as defined under the ESA is not authorized. In the absence of a separate authorization from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, both lethal and non-lethal takes of protected species are a violation of the ESA. Similarly, the appropriate State of California, Regional Water Quality Control Board may still regulate your proposed activity because of impacts to a "water of the State". Therefore, you should also contact appropriate Federal, State and local regulatory authorities to determine whether your activity may require other authorizations or permits.

If you have any questions regarding this matter, please call Ian Liffmann of our Regulatory Division by phone at (415) 503-6769 or by email at [ian.liffmann@usace.army.mil](mailto:ian.liffmann@usace.army.mil). Please address all correspondence to the Regulatory Division and refer to the File Number at the head of this letter.

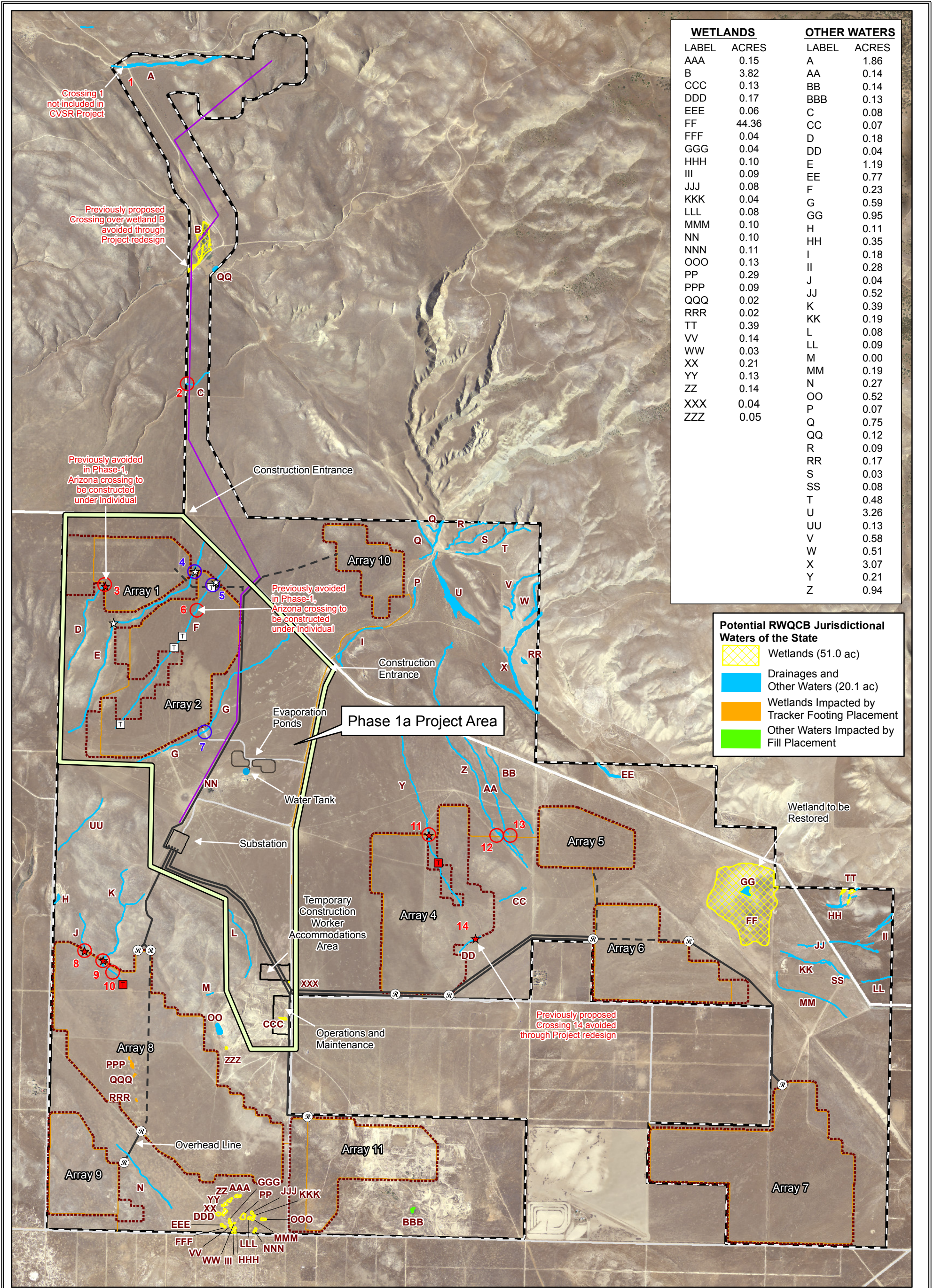
Sincerely,



Jane M. Hicks  
Chief, Regulatory Division

Copy furnished:

CA RWQCB, San Luis Obispo, CA  
CA SWRCB, Sacramento, CA  
H.T. Harvey and Associates; Attn: Pat Boursier



WETLANDS		OTHER WATERS	
LABEL	ACRES	LABEL	ACRES
AAA	0.15	A	1.86
B	3.82	AA	0.14
CCC	0.13	BB	0.14
DDD	0.17	BBB	0.13
EEE	0.06	C	0.08
FF	44.36	CC	0.07
FFF	0.04	D	0.18
GGG	0.04	DD	0.04
HHH	0.10	E	1.19
III	0.09	EE	0.77
JJJ	0.08	F	0.23
KKK	0.04	G	0.59
LLL	0.08	GG	0.95
MMM	0.10	H	0.11
NN	0.10	HH	0.35
NNN	0.11	I	0.18
OOO	0.13	II	0.28
PP	0.29	J	0.04
PPP	0.09	JJ	0.52
QQQ	0.02	K	0.39
RRR	0.02	KK	0.19
TT	0.39	L	0.08
VV	0.14	LL	0.09
WW	0.03	M	0.00
XX	0.21	MM	0.19
YY	0.13	N	0.27
ZZ	0.14	OO	0.52
XXX	0.04	P	0.07
ZZZ	0.05	Q	0.75
		QQ	0.12
		R	0.09
		RR	0.17
		S	0.03
		SS	0.08
		T	0.48
		U	3.26
		UU	0.13
		V	0.58
		W	0.51
		X	3.07
		Y	0.21
		Z	0.94

**Potential RWQCB Jurisdictional Waters of the State**

- Wetlands (51.0 ac)
- Drainages and Other Waters (20.1 ac)
- Wetlands Impacted by Tracker Footing Placement
- Other Waters Impacted by Fill Placement

**Phase 1a Project Area**

- Phase 1a Project Area
- Biological Study Area Boundary (4956 ac)
- Solar Panel Arrays
- Fire Access Roads
- 230 KV Overhead Gen-Tie
- 34.5 KV Overhead Lines
- 34.5 KV Underground Lines
- Riser to 34.5 KV Overhead Lines

**Phase 1a Individual Impacts**

- Utility Line Trenching Locations
- Crossing Locations
- Fence Locations

**Phases 2-4 Individual Impacts**

- Utility Line Trenching Locations
- Crossing Locations
- Fence Locations

Scale

1:24,000  
1 inch = 2,000 feet

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

**California Valley Solar Ranch**  
CVSR Individual WDR Application Materials  
Figure 1: Impacts to Surface Waters of the State

**HPR II**

**H. T. HARVEY & ASSOCIATES**  
ECOLOGICAL CONSULTANTS

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

Prepared by:

**H. T. HARVEY & ASSOCIATES**

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**Prepared for**

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24 August 2011

Project No. 3103-06

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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**

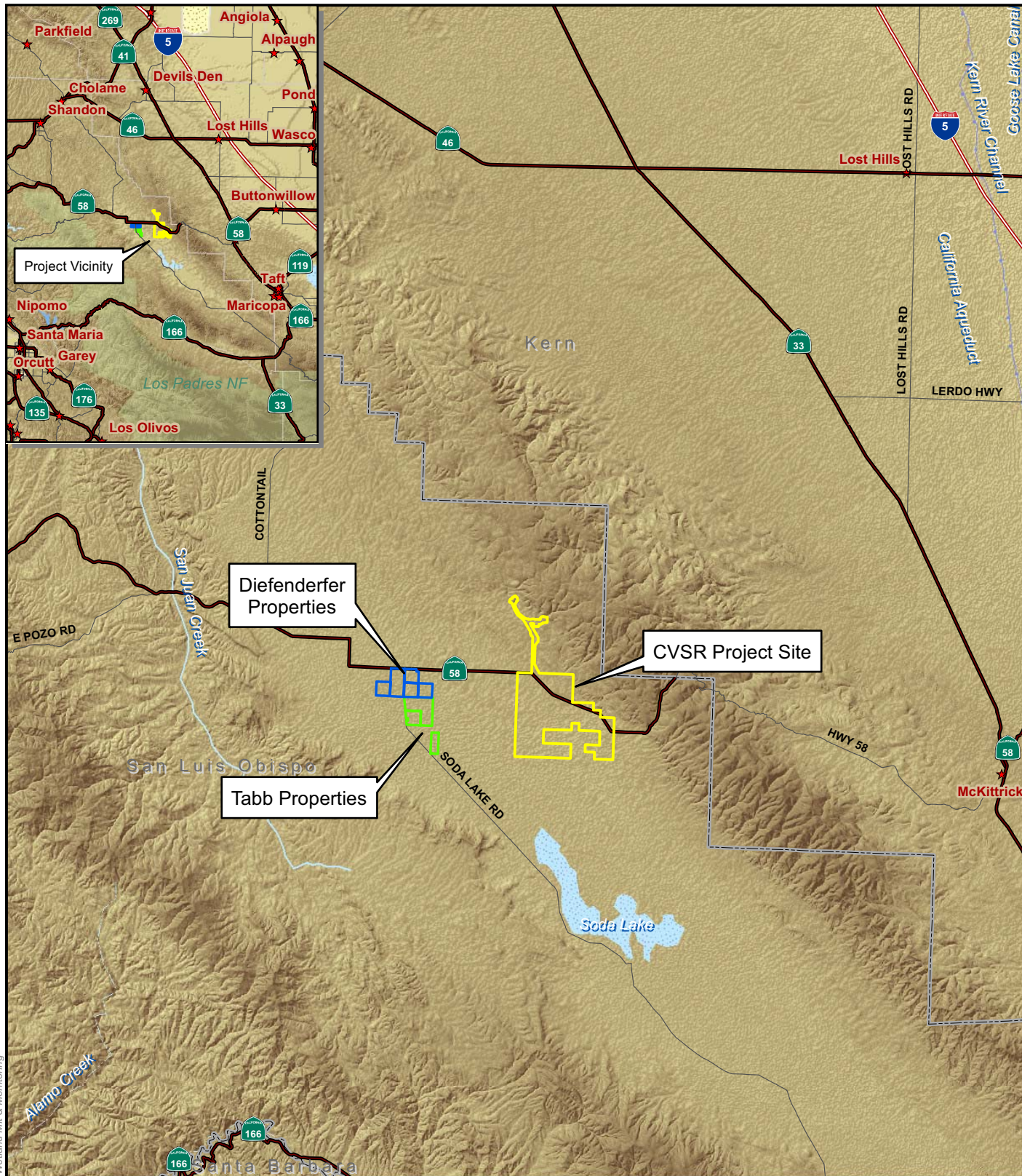
Construction of the CVSR Project will impact freshwater wetland habitat within the jurisdiction of the RWQCB and CDFG. This Mitigation and Monitoring Plan (MMP) describes the type and quantity of impacts to jurisdictional habitats and presents the conceptual mitigation and monitoring plan to compensate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

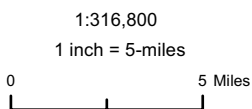




**Legend**

- CVSR Biological Study Area
- Tabb Properties
- Diefenderfer Properties

**Scale**



**California Valley Solar Ranch**  
CVSR Project Site, Off-site Wetland Mitigation  
and Monitoring Plan  
Figure 1: Project Vicinity Map

**HPR II**

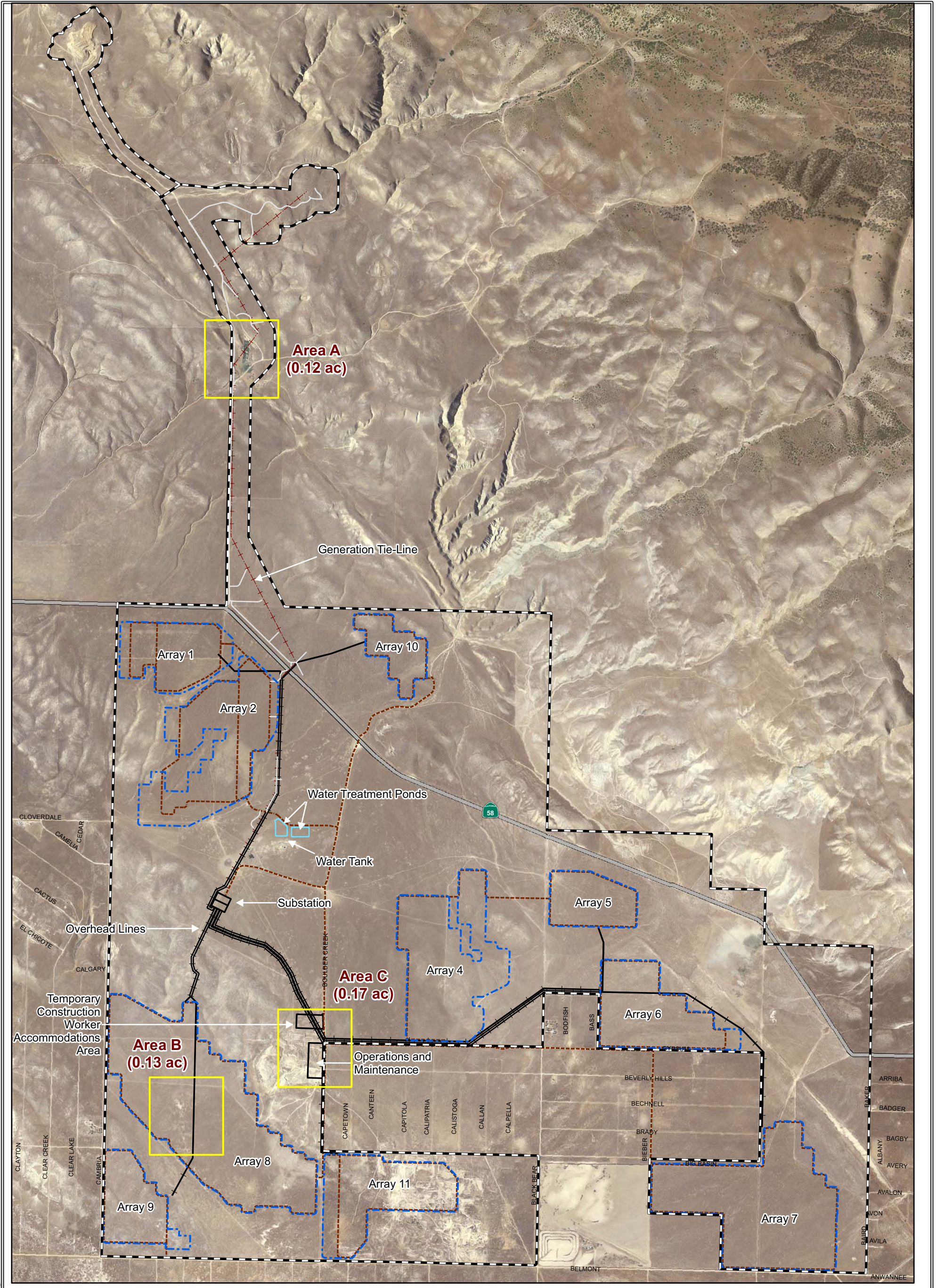


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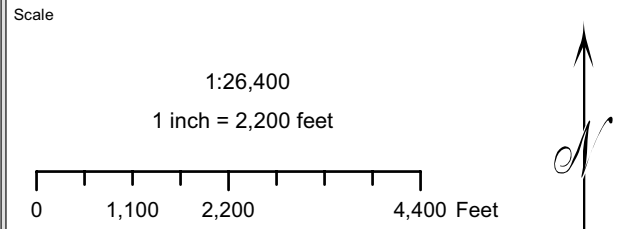
Data Sources: [1] CA GIS Library, [2] ESRI BaseMap USA (2010).

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



**Legend**


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



**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**

<b>HABITAT TYPE</b>	<b>IMPACT SURFACE AREA (AC)</b>	<b>IMPACT TYPE AND LOCATIONS</b>
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 hammondi*), 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 ( $\pm 3$  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).

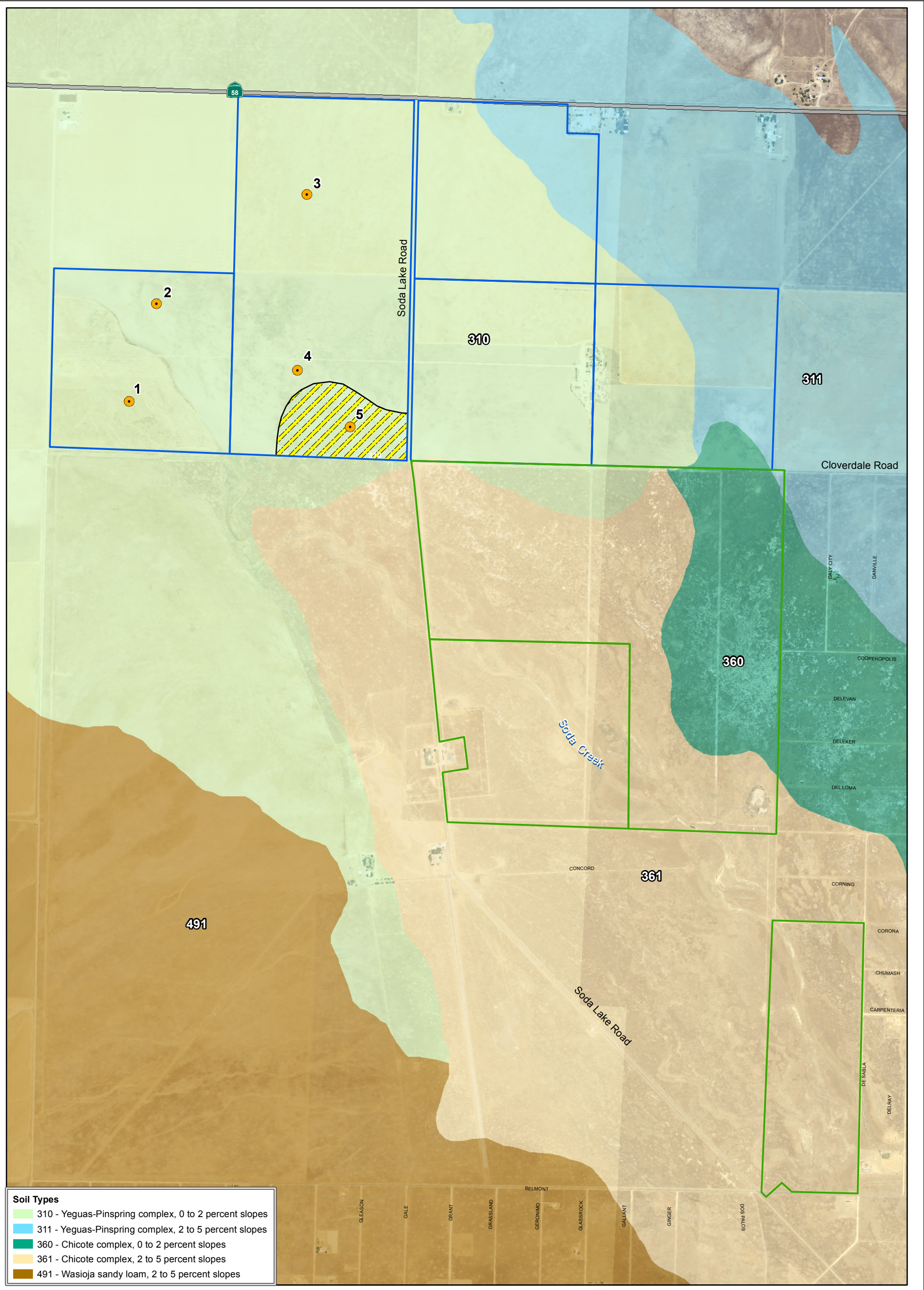
Detailed physical characteristics of soils sampled on the Diefenderfer Property are presented in Table 3. Samples 1-4 were determined to be coarse textured soils that were not suitable for supporting wetland habitat. Sample 5 includes substantially more clay than the other areas and is texturally comparable 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 (*Convolvulus 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.

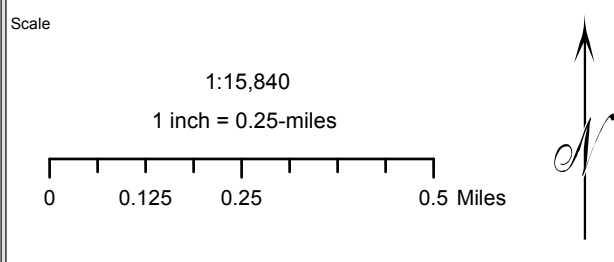


**Soil Types**

<span style="color: lightgreen;">■</span>	310 - Yeguas-Pinspring complex, 0 to 2 percent slopes
<span style="color: lightblue;">■</span>	311 - Yeguas-Pinspring complex, 2 to 5 percent slopes
<span style="color: darkgreen;">■</span>	360 - Chicote complex, 0 to 2 percent slopes
<span style="color: lightbrown;">■</span>	361 - Chicote complex, 2 to 5 percent slopes
<span style="color: darkbrown;">■</span>	491 - Wasioja sandy loam, 2 to 5 percent slopes

**Legend**

<span style="border: 1px solid blue; width: 15px; height: 10px; display: inline-block;"></span>	Diefenderfer Properties
<span style="border: 1px solid green; width: 15px; height: 10px; display: inline-block;"></span>	Tabb Properties
<span style="background: repeating-linear-gradient(45deg, transparent, transparent 2px, yellow 2px, yellow 4px); width: 15px; height: 10px; display: inline-block;"></span>	Area Suitable for Wetland Mitigation
<span style="color: orange; font-size: 12px;">●</span>	Sample Points



**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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**H. T. HARVEY & ASSOCIATES**  
ECOLOGICAL CONSULTANTS

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

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

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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 ( $\pm 3$  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 Tab 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 <sup>1</sup> /AC (LBS)
<i>Achyraena mollis</i>	Blow wives	Native	0-1
<i>Atriplex argentea</i>	Silver saltweed	Native	0-5
<i>Atriplex coronata</i> var. <i>coronata</i>	Crownscale	Native	0-5
<i>Deschampsia danthonioides</i>	Annual hairgrass	Native	0-2
<i>Frankenia salina</i>	Alkali heath	Native	0-10
<i>Hordeum brachyantherum</i>	Meadow barley	Native	0-8
<i>Lasthenia ferrisiae</i>	Alkali goldfields	Native	0-1
<i>Lasthenia fremontii</i>	Vernal pool goldfields	Native	0-3
<i>Leymus triticoides</i>	Creeping wildrye	Native	0-4
<i>Plagiobothrys acanthocarpus</i>	Alkali plagiobothrys	Native	0-2
<i>Trifolium depauperatum</i> var. <i>amplectens</i>	Pale sack clover	Native	0-5
		<b>Total</b>	<b>A min of 30 lbs of PLS/AC<sup>2</sup></b>

<sup>1</sup> 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.

<sup>2</sup> 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  $\pm$  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  $\frac{1}{4}$

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**

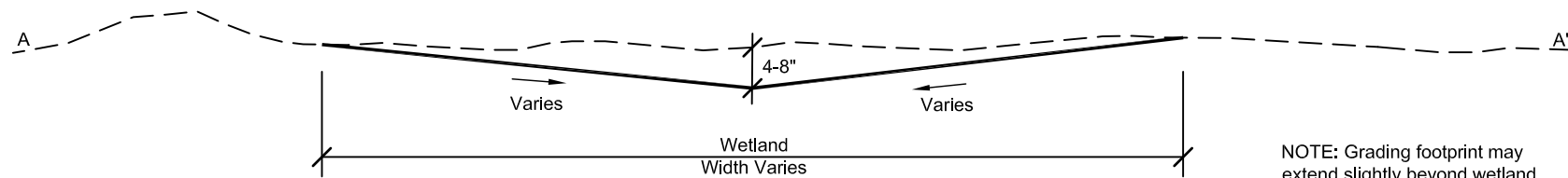
Implementation of the wetland mitigation-site construction is anticipated to occur in Fall 2011 during the same year as the impacts are incurred to minimize temporal loss of habitat and time restoration coincident with regional precipitation patterns. The anticipated approximate schedule for wetland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

**Table 5. Mitigation Approximate Implementation Schedule<sup>1</sup>**

<b>ACTIVITY</b>	<b>SCHEDULE</b>
Site preparation and construction	Fall 2011
Seeding	Fall 2011; post-construction

<sup>1</sup>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.



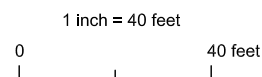
NOTE: Grading footprint may extend slightly beyond wetland footprint.

**Section A: Conceptual Wetland Cross Section**

Legend

- - - Existing Grade  
(Elevation Varies +/- 6")
- Proposed Grade

Scale



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



H. T. HARVEY & ASSOCIATES  
ECOLOGICAL CONSULTANTS

August 2011

## 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 dipyrindyl 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<sup>2</sup> 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 dipyrindyl 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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- Kershaw, K. A. 1973. *Quantitative and Dynamic Plant Ecology*. 2nd Edition. American Elsevier Publishing Company, Inc., New York.
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**APPENDIX A.  
SOIL ANALYSIS RESULTS**

**ERRATA SHEET FOR APPENDIX A**

<b>Diefenderfer Property</b>			
<b>JOB #</b>	<b>PAGE</b>	<b>READS (SAMPLE ID)</b>	<b>READS (IN TEXT)</b>
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

Report No : **11-188-0060**  
Purchase Order : 11-1730  
Date Recd : 07/07/2011  
Date Printed : 07/14/2011  
Page : 1 of 7

## COMPREHENSIVE SOIL ANALYSIS

Sample Description - Sample ID	Half Sat %	pH	ECe dS/m	NO <sub>3</sub> -N ppm	NH <sub>4</sub> -N ppm	PO <sub>4</sub> -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											
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.
Ca meq/L	Mg meq/L	Na meq/L	K meq/L	B ppm	SO <sub>4</sub> meq/L		Coarse 5 - 12	Fine 2 - 5	Sand			Silt .002-.05	Clay 0-.002		
								Very Coarse 1 - 2	Coarse 0.5 - 1	Med. to Very Fine 0.05 - 0.5					
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<sub>4</sub>), 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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### COMPREHENSIVE SOIL ANALYSIS

Sample Description - Sample ID	Half Sat %	pH	ECe dS/m	NO <sub>3</sub> -N ppm	NH <sub>4</sub> -N ppm	PO <sub>4</sub> -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											
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 <sub>4</sub> meq/L		Coarse 5 - 12	Fine 2 - 5	Sand			Silt .002-.05	Clay 0-.002		
								Very Coarse 1 - 2	Coarse 0.5 - 1	Med. to Very Fine 0.05 - 0.5					
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<sub>4</sub>), 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 : Diefenderfer Wetland;  
California Valley, CA  
Job#: 3103-04-30

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

## SOIL APPRAISAL ANALYSIS

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.
						Coarse 5 - 12	Fine 2 - 5	Very Coarse 1 - 2	Sand		Silt .002-.05	Clay 0-.002		
									Coarse 0.5 - 1	Med. to Very Fine 0.05 - 0.5				
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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## COMPREHENSIVE SOIL ANALYSIS

Sample Description - Sample ID	Half Sat %	pH	ECe dS/m	NO <sub>3</sub> -N ppm	NH <sub>4</sub> -N ppm	PO <sub>4</sub> -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.
Ca meq/L	Mg meq/L	Na meq/L	K meq/L	B ppm	SO <sub>4</sub> meq/L		Coarse 5 - 12	Fine 2 - 5	Sand			Silt .002-.05	Clay 0-.002		
								Very Coarse 1 - 2	Coarse 0.5 - 1	Med. to Very Fine 0.05 - 0.5					
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<sub>4</sub>), 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.

**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.