STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

STAFF REPORT FOR REGULAR MEETING OF FEBRUARY 2, 2012
Prepared on January 10, 2012

ITEM NUMBER: 15

SUBJECT: Waste Discharge Requirements, Order No. R3-2011-0225, for California Valley Solar Ranch Class II Surface Impoundments, San Luis Obispo County.

KEY INFORMATION:

Location:	Approximately 60 miles east of San Luis Obispo along highway 58
Owner/Operator:	High Plains Ranch II LLC (Discharger)
Type of Waste:	Non-hazardous designated waste (reverse osmosis brine)
Capacity:	Approximately 4.8 million gallons
Disposal:	Class II surface impoundments
Liner System:	Engineered alternative. Three 60-mil high-density polyethylene (HDPE) liners, leachate collection and removal systems, and a vadose zone monitoring systems.
Existing Orders:	None – new facility
This Action:	**Adopt Waste Discharge Requirements Order No. R3-2011-0225**

SUMMARY

Central Coast Regional Water Quality Control Board (Water Board) staff proposes Waste Discharge Requirements (WDRs) Order No. R3-2011-0225 (Order or Order No. R3-2011-0225) for the California Valley Solar Ranch Class II Surface Impoundments (surface impoundments) to specify design and operation requirements. These surface impoundments will contain brackish discharges from a reverse osmosis system treating the underlying groundwater for use at the site. The design and operation requirements contained in this proposed Order will protect water quality from wastes discharged into the surface impoundments.

Water Board staff is also proposing a separate Order for this Solar Ranch project (Board Item No. 14, Proposed Order No. R3-2012-0006) for the discharge of fill material to waters of the State for the California Valley Solar Ranch. Under Proposed Order No. R3-2012-0006, the Discharger will impact 0.31 acres of ephemeral drainages and wetlands. The Discharger will construct nine road crossings, install fifty-one pier footings, fill a man-made pond, install array security fencing, and conduct utility trenching.

Separate Orders are proposed because the waste discharge associated with the Class II surface impoundments is significantly different (potential surface water and groundwater impacts from brine discharges) than the waste discharges associated with the fill materials (potential wetlands impacts from facility construction). The surface impoundments are located

outside the 100-year flood plain, must meet or exceed requirements in California Code of Regulations Title 27, is a Land Disposal Program project, and will continue during the entire operating life of the Solar Facility. The discharges of fill material are located within ephemeral drainages and wetlands, are subject to regulation under California Water Code Section 13263(a), are a Stormwater Program project, and conclude at the end of the three-year Solar Facility construction period. The differences make the adoption of separate Orders necessary to allow Water Board staff to efficiently permit the projects to protect water quality and beneficial uses.

DISCUSSION

The Discharger submitted a report of waste discharge on May 19, 2011, to facilitate the issuance of WDRs to authorize the discharge of reverse osmosis brine into two surface impoundments. The proposed Order provides a description and includes operational and monitoring requirements for the surface impoundments. The design and construction specifications within the proposed Order meet or exceed the requirements specified in California Code of Regulations (CCR) Title 27, which pertain to siting, design, construction, and operation of Class II surface impoundments.

Facility Description: The Discharger will build a reverse osmosis water treatment facility to supply potable water and fire protection water for a solar photovoltaic power plant located 60 miles east of the City of San Luis Obispo. The Discharger will treat groundwater using reverse osmosis with a maximum discharge to the surface impoundments of approximately 8,000 gallons of brine per day. The peak brine pond discharge flows will occur during the three-year power plant construction period. The Discharger estimates brine discharge flows of approximately 4,000 gallons per day after the Discharger completes construction for the life of the surface impoundments.

Designated waste is identified in Title 27, Section 20210, as a nonhazardous waste that consists of, or contains pollutants which, under ambient environmental conditions at the waste management unit, could be released at concentrations in excess of applicable water quality objectives, or that could reasonably be expected to affect beneficial uses of waters of the state. The discharge of reverse osmosis brine poses a significant threat to water quality. Therefore, the discharge is a designated waste and, as such, the Discharger must discharge the brine to a Class II surface impoundment pursuant to Title 27.

The wastewater consists of concentrated brine from the reverse osmosis water treatment plant. The Discharger developed brine waste characteristics based on feed water quality, reverse osmosis treatment removal, finished water quality goals, and resulting mass balance. The estimated concentrations are as follows:

Parameter	**Concentration (mg/L)**
Total Dissolved Solids	29,640
Chloride	2,340
Fluoride	2.4
Sulfate	19,200
Calcium	2,520
Iron	3.6
Potassium	55.8
Magnesium	1,200

Sodium	4,800
Aluminum	3.3
Arsenic	0.042

The Discharger will construct the surface impoundments using an engineered alternative to the prescriptive liner requirements of Title 27 for the Class II surface impoundments. The liner will include a primary 60-mil thick high density polyethylene (HDPE) geomembrane, a geonet drainage layer as a leachate collection and removal system (LCRS), a secondary 60-mil thick HDPE geomembrane in lieu of the clay liner, a geonet drainage layer as a vadose zone monitoring system, and a tertiary 60-mil thick HDPE geomembrane.

The LCRS and vadose zone monitoring systems will provide liner leak detection. In the event leachate is detected in either the LCRS or vadose zone monitoring systems, the Discharger will either implement an Executive Officer approved Response Action Plan or cease discharge to the surface impoundment with the leak. The Discharger is required to identify the leak(s) and repair the liner system. The discharge of wastes to the surface impoundment is not allowed again until Water Board staff has determined that repairs to the liners are complete and pond containment is restored.

The surface impoundments are designed to hold 50-years of solids accumulation while maintaining adequate brine liquid discharge capacity. Once the solids capacity of the surface impoundments are reached, the Discharger will "clean close" the impoundments by hauling all materials offsite for disposal at a facility permitted to accept the waste.

Surface Water: The surface impoundments are located entirely outside of the 100-year flood plain. Unnamed surface drainages flow intermittently, primarily during heavy rain events. The drainages flow to Soda Lake approximately four miles to the southeast of the surface impoundments. Soda Lake is a shallow, ephemeral, alkali lake that retains water and allows no outflow to other bodies of water. The Discharger will route surface drainage around the surface impoundments and the Discharger is required to keep two feet of freeboard between the waste and the top of the liner at all times.

Groundwater: Groundwater is located at depths of approximately 150 feet below the surface impoundments and based on regional flow information flows in a relatively consistent southwest direction. An onsite supply well for the reverse osmosis treatment system is located approximately 800 ft from the surface impoundments. No other domestic or irrigation wells are known to exist within one mile of the surface impoundments.

Groundwater Quality: The Discharger collected one groundwater sample from an onsite well and the results indicate elevated concentrations of selenium, total dissolved solids, sulfate, sodium, chloride, and nitrate (as N). Once the facility is constructed the Discharger will collect additional groundwater samples from newly installed monitoring wells located upgradient and downgradient of the surface impoundments.

Proposed Order: The proposed Order requires the Discharger to properly construct, operate, and maintain the surface impoundments to protect water quality.

MONITORING AND REPORTING PROGRAM

The Monitoring and Reporting Program (MRP) includes:

Part I – Monitoring and Observation Schedule: This section requires periodic routine inspections of the surface impoundments, the leachate collection system, the vadose zone monitoring system, and detailed analytical monitoring of groundwater and leachate.

Part II – Sample Collection and Analysis: This section establishes criteria for sample collection and analysis, methods to determine concentration limits, and specifies how the Discharger must maintain these records.

Part III – Statistical and Non-Statistical Analysis of Data: This section establishes methods for the Discharger to determine surface impoundments compliance with water quality protection standards based on laboratory analytical information.

Part IV – Reporting: This section establishes formats and requirements that the Discharger must follow when submitting analytical data, annual reports, and summaries to Water Board staff .

Part V – Definition of Terms: This section defines specific terms used in the MRP.

ENVIRONMENTAL SUMMARY

This Order contains prohibitions, discharge specifications, water quality protection standards, and provisions intended to protect the environment by mitigating or avoiding impacts of the surface impoundments operations on water quality.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

The County of San Luis Obispo certified the Final Environmental Impact Report for the California Valley Solar Ranch 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, Section 21000, et seq.) in accordance with Title 14, Chapter 3, and Section 15301.

PUBLIC NOTICE AND COMMENTS ON ORDER NO. R3-2011-0225

Central Coast Water Board staff distributed the draft Order No. R3-2011-0225 and MRP No. R3-2011-0225 on September 9, 2011, to a list of interested parties and agencies and surrounding landowners that have been involved with the California Valley Solar Ranch development. After a 30-day public comment period, Water Board staff received one comment letter from David Webb (Attachment 3) within the comment period and one comment from the Discharger (Attachment 4) after the comment period. Water Board staff considered all comments submitted. Water Board staff contacted Mr. Webb to discuss the location of the hearing for this item. Mr. Webb indicated that he would travel to Salinas for the Board meeting and that having the meeting in Salinas rather than San Luis Obispo would not present a hardship for him. Additionally, the Discharger preferred the Salinas location for a Board meeting because proposed Order No. R3-2012-0006 for the discharge of fill material to waters of the state will also be heard by the Board at the February Board meeting.

The following are comments from Mr. David Webb's comment email, dated October 13 2011:

Comment 1: Mr. Webb has concerns regarding Anthrax and Valley Fever spores. "Airborne dust from the dried brine is also serious concern." "Long time residents have concerns

regarding intensive solar construction and dry brine that will stir these spores up and carry them airborne on the wings of our powerful summer winds."

Water Board Staff Response: Anthrax and Valley Fever spores are not found in groundwater. Area soils contain Anthrax and Valley Fever spores, but the discharge of brine into the surface impoundments will not be a source of the spores. The Discharger is required to implement mitigation measures identified through the CEQA[1] process to minimize project impacts with regards to Anthrax and Valley Fever. Compliance with non-Valley Fever dust mitigation measures will be verified by the San Luis Obispo Air Pollution Control District. Compliance with Valley Fever related mitigation measures will be verified by the San Luis Obispo County Health Department. Issues associated with suspected anthrax infections will be reported to the County Agricultural Commissioner.

Comment 2: Commenter is "curious to hear how the solar company's plan to conform to Central Coast Regional Water Quality Control Boards requirements for containment of the brine they have left from the reverse osmosis process."

Water Board Staff Response: The Discharger designed the surface impoundments to contain all brine discharges and all stormwater associated with a 1,000 year storm event without discharging to surface waters. The Discharger will install groundwater monitoring wells to evaluate potential impacts to groundwater quality. The Discharger will monitor the performance of the liner system utilizing primary and secondary sumps for leak detection.

Comment 3: "The water wells in the area produce a very high content of suspended solids." "We are unaware of any residents in the area that have wells that produce water that is low enough in suspended solids to be of potable use."

Water Board Staff Response: Water Board staff is not aware of high total suspended solids, but is aware that area groundwater contains elevated levels of total dissolved solids. The Discharger is aware of the elevated total dissolved solids, which is why the Discharger will be treating the water with reverse osmosis and will be discharging the reverse osmosis brine to the surface impoundments. The reverse osmosis process will remove the high total dissolved solids and produce potable water.

Comment 4: "There are a string of vernal pools between the solar site and Soda Lake." "All water runoff that washes into these ponds that first washes man-made material or is discharged from a man-made 'brine pond' can affect this sensitive eco system downstream."

Water Board Staff Response: This proposed Order prohibits the discharge of waste from the surface impoundments to surface waters. Also see response to Comment 2 above.

The following comment was submitted by a consultant representing the discharger in a letter dated December 22, 2012:

Discharger Comment: The Discharger submitted comments (Attachment 4) regarding the leachate collection and recovery system (LCRS) and the proposed requirement to cease discharge of waste if leachate is discovered in the LCRS sump (proposed Order, Specification C.17). The Discharger submitted information indicating the primary liner system has the

[1] See Final Environmental Impact Report (EIR) mitigation measures AQ-1.3 (page C.4-15), AQ-2.1 (page C.4-18), and HZ-7.3 (page C.9-27). EIR located at http://www.sloplanning.org/EIRs/CaliforniaValleySolarRanch/index.htm.

potential to discharge minor amounts of liquid even if the liner system is not significantly compromised. The Discharger indicated that leachate could permeate through the liner and/or the liner could have pin holes that are not identifiable using common leak detection devices, which would allow minor amounts of leachate through the liner. The Discharger contends that it would be very difficult if not impossible to eliminate all leachate from getting into the LCRS. The LCRS is designed to return leachate to the surface impoundment and additional liners exist beneath the LCRS to protect groundwater quality. Additionally, the Discharger will monitor the vadose zone and groundwater to confirm there are no impacts to groundwater.

Water Board Staff Response: Water Board staff agrees that minor amounts of leachate detected in the LCRS sump may not warrant ceasing the discharge to the ponds. The LCRS sump is designed to remove the leachate and discharge it back into the brine pond. If the Discharger properly manages detectable leachate, impacts to groundwater quality are very unlikely because leachate is returned to the pond and there is added protection from the secondary and tertiary liners. Based on our review of the information provided by the Discharger, Water Board staff added language to the proposed Order, Specification C.17 that allows the Discharger to implement an Executive Officer approved Response Action Plan for leachate management in lieu of immediately ceasing discharge if leachate is detected in the LCRS sump or the vadose zone monitoring system. Water Board staff also removed language from Monitoring and Reporting Program Order No. R3-2011-0225 Section F.1.c. *Leachate Monitoring* to allow the Discharger to implement an Executive Officer approved Response Action Plan instead of immediately ceasing discharge to the surface impoundment. The Response Action Plan will likely include ranges of leakage rates that, if exceeded, will require the Discharger to implement monitoring, corrective actions, or ceasing discharge to protect water quality, based on the rate of leakage.

CONCLUSION

The proposed Order provides operational and monitoring requirements for the California Valley Solar Farm surface impoundments to protect groundwater and surface water through required engineering controls and containment systems, preventative inspections, and monitoring. The surface impoundments do not pose a significant risk to groundwater and surface water with the engineered alternative liner system, controls, and monitoring requirements included in the proposed Order.

RECOMMENDATION

Adopt Waste Discharge Requirements Order No. R3-2011-0225 with Monitoring and Reporting Program No. R3-2011-0225.

ATTACHMENT

Attachment 1: Proposed Waste Discharge Requirements Order No. R3-2011-0225
Attachment 2: Monitoring and Reporting Program No. R3-2011-0225
Attachment 3: David Webb comment letter, October 13, 2011
Attachment 4: Fugro Consultants, Inc. comment letter, December 22, 2011 (without CQA attachment)