



# California Regional Water Quality Control Board Lahontan Region



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<b>DOCKET</b>	
<b>08-AFC-2</b>	
DATE	04/17/09
RECD.	04/20/09

## REVIEW OF REPORT OF WASTE DISCHARGE, BEACON SOLAR ENERGY PROJECT, FREMONT VALLEY, KERN COUNTY, WDID No. 6B150901001

Beacon Solar, LLC, (Applicant) submitted a Report of Waste Discharge (RoWD) for the Beacon Solar Energy Project (BSEP) on May 21, 2008. The California Regional Water Quality Control Board, Lahontan Region (Lahontan Water Board) issued a comment letter on the May 2008 RoWD on January 12, 2009. In response to the Lahontan Water Board letter, the Applicant submitted a Revised RoWD on March 20, 2009.

### Project Description

The Applicant is proposing to construct, own, and operate the BSEP. The proposed project would consist of a concentrated solar electric generating facility on approximately 2,000 acres in the eastern portion of Kern County, California.

BSEP will use parabolic trough solar thermal technology to produce electrical power using a steam turbine generator fed from a solar steam generator. The solar steam generator will receive heated transfer fluid (HTF) from solar thermal equipment composed of arrays of parabolic mirrors that collect energy from the sun.

### Disposal Facilities

Process water wastes, including cooling tower blowdown and waste streams from the neutralization tank, would be disposed to lined, onsite evaporation ponds. Constituents of concern would include chloride, sodium, sulfate, total dissolved solids, biphenyl, diphenyl oxide, potassium, selenium, and phosphate. The Revised RoWD proposes three evaporation ponds with a nominal surface area of 40 acres and a land disposal unit consisting of approximately 7.4 acres. The surface impoundments are the disposal facilities for wastewater from operations at BSEP. A land treatment unit will be used to receive, temporarily store, and treat soil contaminated with heat transfer fluid from spills and leaks, which commonly occur in the operation of this type of solar facility.

## **Receiving Waters**

Receiving waters that could be affected by this project are Fremont Valley Groundwater Basin and the ephemeral streams, Pine Tree Creek, which bisects the site, and an unnamed wash, which drains into the western portion of the site. Additionally, any other waters of the State crossed by the linear structures (e.g., utility lines) outside of the 2,000 acre site would be considered potential receiving waters.

## **Incomplete RoWD**

As submitted, the Revised RoWD is incomplete. Specific information needed to complete the RoWD is identified below.

## **Necessary Information for the RoWD Requested in Lahontan Water Board Letter Dated January 12, 2009**

The Revised RoWD does not contain all of the information previously requested by the Lahontan Water Board (January 12, 2009 comment letter). Specific deficiencies are outlined in the following text.

### **1. Waste Characterization**

- a. The Revised RoWD states that the wastewater would be classified as designated waste under California Water Code section 13173, because the wastewater contains constituents that could affect the beneficial uses of the waters of the State. The specific constituents must be listed in order to design an appropriate monitoring program.
- b. There are discrepancies between Table 8, Predicted Chemistry of Evaporation Pond Residue, and Table 3-4 of Appendix G, Predicted Chemistry of Evaporation Residue. For example, selenium and zinc are listed in Table 8, but not in Table 3-4. Hexavalent chromium and sulfate are listed in Table 3-4, but not in Table 8. Also, there are some differences of the predicted concentrations for the same constituent. For example, the predicted concentration of boron is 247 parts per million (ppm) in Table 8 and 457 ppm in Table 3-4. The predicted concentration of fluoride is 630 ppm in Table 8, but 166 ppm in Table 3-4. These discrepancies must be resolved prior to the adoption of waste discharge requirements for the facility.
- c. The Revised RoWD provides additional information on waste characterization and includes the statement that heat transfer fluids "biodegrade relatively rapidly in the environment, have slight toxicity to tested terrestrial species, higher toxicity to aquatic species, and a potential to bioaccumulate." The Lahontan Water Board requires additional information to evaluate the potential threat from the waste stream. Provide specific information regarding anticipated degradation rates, potential breakdown products, and toxicity, fate and transport information for HTF and its breakdown products.



## 2. Plot Plan

Lahontan Water Board staff apologizes that the January 12, 2009 letter specified that all figures should be 8.5 x 11 inches. Staff realizes that the features of a 2,000-acre site cannot be adequately portrayed at such a scale. Please include all figures at an appropriate scale and size. Also, staff could not locate the Assessor's Parcel Numbers or the parcel boundaries on Figure 2.

## 3. Flood Protection

The Lahontan Water Board requested information on facility-wide flood protection. The January 12, 2009 letter stated "Provide a description of the measures that are taken for controlling stormwater runoff and runoff at the facility." Much of the required information appears to be contained in the Applicant's Conceptual Drainage Study (Drainage Study), which was submitted to the California Energy Commission's (CEC). The CEC issued a Preliminary Staff Assessment (PSA) in April 2009 that included an evaluation of the Drainage Study. Based on the PSA, offsite stormwater, under current conditions, flows across the site via Pine Tree Creek and small drainage swales. As proposed, the BSEP project would alter historic stormwater flow paths and change runoff patterns from the property. Site development would include an onsite stormwater collection system that would discharge the majority of runoff directly into a rerouted Pine Tree Creek. The PSA concluded that runoff from the site as well as potential nuisance flows or discharges of hazardous substances from plant operation and maintenance would cause significant impacts to the receiving waters. The PSA also raised concern regarding the retention basin design and location.

Lahontan Water Board staff concurs with the CEC's concerns regarding stormwater as expressed in the PSA and concurs with the relevant conditions listed in the Soil and Water Resources section of the PSA.

Additionally, the PSA discusses the proposed design for rerouting the Pine Tree Creek. The PSA concludes that the design of the rerouted channel is inadequate for flood control and for reproducing the hydrologic and hydromorphic functions of the creek. Based on the Public Meeting held in California City on April 14, 2009, Lahontan Water Board staff understands that the design for the rerouted creek is currently being modified. This information must be submitted with a subsequent revision or amendment to the Revised RoWD.

## 4. Civil Engineering Design Package

The Lahontan Water Board's January 12, 2009 letter instructed the Applicant to include a Plan of Development/Civil Engineering Design Package in the Revised RoWD. The plan/package was to include grading, clearing, excavation, and stormwater management system plans. The intent of this comment was for a facility-wide plan. This information was not provided in the Revised RoWD.

## 5. Design Report and Operations Plan

a. The Revised RoWD proposed three double-lined evaporation ponds with a nominal surface area of 40 acres. The purpose of multiple ponds was to allow plant operations to continue in the event that one of the ponds would need to be taken out of service. Each pond would be designed to have enough surface area so that the evaporation rate exceeds the process wastewater and cooling tower blowdown rate at peak design conditions and at annual average conditions. However, the PSA concluded that to contain the expected flows, the impoundments would have to have a total area of at least 43.5 acres. Also, according to the PSA, the applicant would construct another pond (in addition to those three proposed to hold wastewater) to be used for dilution of potentially toxic salinity concentrations in the evaporation ponds. With this additional pond, the nominal evaporation pond surface area would be on the order of 58 acres. The fourth pond was not included in the Revised RoWD. The accurate size, number, and uses must be included in the RoWD.

b. The January 12, 2009 letter requested a "description of the manner in which liquid and solid wastes (wastewater and soil) are handled and disposed..." The Revised RoWD implies that that wastewater (classified as a designated waste) used for dust control will be part of the wastewater management. The volumes, sources and application rates of this wastewater intended for dust control was not provided. A *Facilities Operation Dust Control Plan* (mentioned in Appendix G) must be submitted in the RoWD for the RoWD to be properly evaluated by Water Board staff.

### Additional Deficiencies

In addition to the comments conveyed previously, Lahontan Water Board staff noted additional deficiencies in the Revised RoWD as described in the following text.

#### 1. Heat Transfer Fluid Spills

The Revised RoWD states that HTF spills will be identified by daily inspections. The Revised RoWD does not describe how HTF spills will be identified, i.e., are these spills apparent based on visual inspection or will the use of a detection instrument be used? The Revised RoWD states that releases of more than 25 gallons of HTF fluid will be reported to the Lahontan Water Board. How will the quantity of the release be estimated? What are the emergency response plans in the event of rupture on the Western Garlock fault strand, which bisects the site? Such an event could result in releases from containment structures and piping.

#### 2. HTF Spill Staging Area

Describe the staging area where HTF contaminated soils will be temporarily stored. Specifically, where will the staging area be located, what is its size, what are the design

specifications for the underlying liner, will the staging area be bermed, will there be secondary containment, and how will runoff from the staging area be controlled?

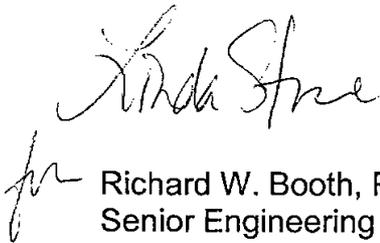
### 3. Regional Geology in the Area of the Project Site

The legend for Figure 5 is incomplete. Please include a legend for the geologic units.

### 4. State Water Resources Control Board (State Water Board) Resolution 75-58

The Applicant is proposing the use of high quality groundwater for power plant construction and power plant cooling. State Water Board Resolution 75-58, Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling states that fresh inland waters should only be used for power plant cooling if other sources of water or other methods of cooling would be environmentally undesirable or economically unsound. The Revised RoWD does not demonstrate that accessing and using a source of lower quality water is environmentally undesirable or economically unsound. An evaluation of the use of lower quality must be submitted to the Lahontan Water Board.

We look forward to expediting your project while assuring that the beneficial uses of the State's water are protected. If you have any questions or comments, please contact me directly at (530) 542-5574 or [RBooth@waterboards.ca.gov](mailto:RBooth@waterboards.ca.gov).



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