

DOCKETED

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**CALIFORNIA
ENERGY COMMISSION**



**CALIFORNIA
NATURAL
RESOURCES
AGENCY**

February 13, 2024

Mahnaz Ghamati, Compliance Manager
Mojave Solar LLC
42134 Harper Lake Road
Hinkley, California 92347

Data Requests for Mojave Solar Project (09-AFC-05C) Capacity Increase for Existing Evaporation Ponds

Dear Mahnaz Ghamati:

The California Energy Commission (CEC) staff, in consultation with Lahontan Regional Water Quality Control Board staff, is requesting information specified in the enclosed data requests which is necessary for the staff analysis of the Mojave Solar Project (MSP) petition to amend (TN#253380) to increase capacity at each of the plant's four evaporative ponds. These data requests seek additional information in the areas of water resources, geological resources, cultural and tribal resources, transportation, and socioeconomics based on the contents of the petition to amend.

To ensure a timely environmental review, CEC staff is requesting responses to the data requests within 30 days. If you are unable to provide the information requested or need to revise the timeline, please let me know within 10 days of receipt of this letter.

If you have any questions, please email me at ashley.gutierrez@energy.ca.gov.

Ashley Gutierrez
Ashley Gutierrez
Compliance Project Manager

cc: David Rosas Galindo, MSP Plant Manager
Todd Battey, Engineering Geologist, Lahontan Water Board
Jeff Brooks, Senior Engineering Geologist, Lahontan Water Board

Enclosure: Data Requests

MOJAVE SOLAR PROJECT (09-AFC-05C) DATA REQUESTS

WATER RESOURCES

Authors: James Ackerman and Adam White

BACKGROUND

Based on review of the original Application for Certification, (AFC) (TN 52813), initial pond design proposed a sufficient pond depth so that residual solids would not require removal during the life of the plant and that pond operational depth included capacity to contain precipitation from the 1,000-year, 24-hour storm event, while maintaining the required two feet of pond free board. The Report of Waste Discharge submitted on April 16, 2010, included a Detection Monitoring Program (DMP). The DMP (Section 3.3.1, Evaporation Pond Clean Out) states the following: preliminary design estimates indicate that if one pond is undergoing clean out activities, the remaining ponds can operate effectively for up to one year; and, that the evaporation ponds would be designed to hold up to 2 feet of residue built up over the 30-year life span. Final Conditions of Certification (Waste Discharge Requirements, Soil & Water-2, Soil and Water Resource – Attachment A, "Finding 15" included a statement that "For safety and operational purposes, accumulated solids would need to be removed from the surface impoundments when the solids reach a depth of two feet above the bottom of the impoundment" (TN 58496).

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1. Provide calculations which demonstrate the required total pond surface area necessary so that the actual evaporation rate will exceed pond discharge rate at both maximum design conditions and annual average conditions. Given the current situation, indicate what operational changes (besides adding additional ponds) are necessary to reduce pond surface elevations, especially in the event of a mandated storm event.
2. Provide a description of corrective actions to be taken should a release occur either to or from the evaporation ponds, or otherwise require clean out.
3. Provide calculations showing the volume of solids sent to the ponds on a daily and annual average basis. Discuss how water process flows vary seasonally and the relationship (if any) to power generation.

BACKGROUND

As part of the original AFC (TN 52813), a basis of design report (Ref. 1) was provided which included calculations for design, construction, and operation of evaporation ponds and significant assumptions, methodologies, and computational methods used in arriving at conclusions in the document. The plants' evaporative ponds are considered Class II waste management units, pursuant to CCR, title 27, Section 20310, and rely solely on evaporation as the means for wastewater disposal. The plant provided a

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revised water flow balance, dated December 26, 2023. Based on our initial calculations for updated process flow versus the original AFC basis of design calculations for pond evaporation, it appears that sufficient pond area would exist to evaporate process flows. Staff cannot verify why the plant continues to experience wastewater disposal problems necessitating additional pond construction.

4. Please explain what design assumptions require revision based on actual operating conditions. How have evaporation rates changed over time? What are the future projections of evaporation versus a potential increase in pond total dissolved solids (TDS) based on historic operational data? How do actual rates vary from pan evaporation rates cited in original calculations?
5. In an Excel format, please provide monthly inflow and outflow data for both Alpha and Beta water treatment facilities during operation.

BACKGROUND

According to the *Guidelines for Installation of: HDPE and LLDPE Geomembrane* (International Association of Geosynthetic Installers [IAGI] 2015), "The geomembrane shall not be allowed to 'bridge over' voids or low areas in the subgrade. The geomembrane shall rest in intimate contact with the subgrade". The IAGI Installation Guidelines also states: "The Seaming shall primarily be performed using automatic fusion welding equipment and techniques. Extrusion welding shall be used where fusion welding is not possible such as at pipe penetrations, patches, repairs and short (less than a roll width) runs of seams".

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6. With respect to the scenario of installing 60 mil high-density polyethylene (HDPE) liner over the K-rail, how will the liner be secured at the base of the K-rail to ensure voids do not form that could cause tearing?
7. Why was extrusion welding of the HDPE liner with vacuum box testing selected over fusion welding with air pressure testing?

BACKGROUND

Section 10 Surveying, of the Construction Quality Assurance Plan (Appendix 10.3 of the PTA) does not mention survey tasks associated with the two measuring posts at each of the existing evaporation ponds used to monitor the required 2 feet of freeboard.

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8. How will the existing freeboard measuring posts be recalibrated and surveyed to a standard benchmark to reflect the added capacity of the evaporation ponds and ensure accurate monitoring of the required freeboard?

BACKGROUND

In response to a staff request, the plant submitted a Post Certification Project Change Questionnaire (PCQ) describing changes to the water treatment process that took place in 2019. The changes resulted in the reverse osmosis system being operated as a Closed-Circuit Reverse Osmosis (CCRO) system. The PCQ stated that the modification did not result in any changes in the plant water flow balance. Staff would like to understand this change in relation to original system design and assess the impacts from those changes. Staff understands that the CCRO system works by recirculating pressurized feedwater until a desired recovery level is reached and brine is replaced with fresh feed without stopping the flow of pressurized feed or permeate. Staff is concerned that this change to the system may have resulted in an increase in freshwater use, resulting in an increase in wastewater discharged to the pond. Also, given recent issues with system pipe leakage, that system's pressures may have exceeded original design parameters for original materials used in construction.

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9. Please provide analysis regarding how much additional feed water is used and data justifying why there is no resulting increase in flow from the system to the ponds. Discuss operating pressures including original and new design parameters.

CULTURAL AND TRIBAL CULTURAL RESOURCES

Author: Patrick Riordan

BACKGROUND

Section 6.5 of the PTA indicates that existing equipment would be moved, or field adjustments would be considered to allow for construction of a soil berm around both Alpha and Beta ponds. Additionally, Section 6.5 of the PTA and the proposed Design Plans include the use of a cast-in-place concrete stem wall/berm around the Beta ponds.

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10. Please identify what existing equipment may need to be moved to accommodate the berm construction and describe the extent and depth of any expected soil disturbances, if any, for all anticipated equipment relocations.
11. Indicate the depth of excavation associated with the construction of the proposed cast-in-place stem wall/berm around the Beta ponds.

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Section 7.3 of the PTA indicates that constructing additional berms at the Alpha and Beta ponds will not necessitate ground excavation in undisturbed areas and will therefore not have an impact on cultural resources.

DATA REQUEST

12. Provide a description of the disturbed soil prisms that comprise the existing berms at both the Alpha and Beta ponds. Please include in this description the approximate depth from the surface of the existing berms to the underlying undisturbed native soils.

GEOLOGICAL RESOURCES

Author: Mike Turner

BACKGROUND

Section 6.2 of the PTA states, "the addition of the extension liner system provides 2 feet of additional temporary capacity in each pond or an overall increase of approximately 25% more volume to the evaporation ponds for optimizing maintenance activities at the plant." Section 6.8 of the PTA states, "this adjustment will provide additional storage capacity, enabling MSP to sustain plant operations until the construction of the new ponds."

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13. Please explain if these temporary improvements will be left in place after the new ponds are operational. If so, how long will they remain in place?
14. Please explain the demolition measures to restore the site to pre-modification conditions if the temporary improvements are not made permanent.
15. Has a geotechnical engineer evaluated and rendered a decision about the existing subgrade's ability to support the K-rails and concrete extensions as is? Or will excavation and re-compaction of the subgrade below the K-rails and concrete extensions be required to ensure capacity to support the K-rails and concrete extensions?
16. The plan sheets do not show that the K-rails have a foundation, and the plans show that the concrete extensions have only a 6" x 6" keyway as a foundation. Has a geotechnical engineer approved this design?

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17. How will the temporary K-rails and concrete extensions be protected from vehicle damage and a possible breach as a result?

LAHONTAN REGIONAL WATER QUALITY CONTROL BOARD

Author: Todd Battey

BACKGROUND

Lahontan Regional Water Quality Control Board (LRWQCB) staff provided the following questions to better understand plant processes associated with the evaporation pond's proposed modifications.

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18. How will freeboard be measured at each evaporation pond after the pond berms are modified?
19. How will the lowest point along the berm for each pond be measured and marked for future measurement of freeboard?
20. How will accumulated sludge be removed from the evaporation ponds without damaging the liners?
21. What is the original source of the soil that will be used to build up the berms? Section 6.5 states that extra soil from the original construction will be used, but what was the origin of that soil and documentation that it was free of environmental contaminants?
22. The details in the Appendix indicate that the K-rails will be placed directly above the anchor trench of the existing liner system. Any modifications to the proposed design must be protective of the existing liner system. Similarly, the detail in the Appendix for the concrete berm indicates that berm will be 10" wide with a varied height of presumably up to 2 feet and a 6" x 6" key. Please provide structural calculations to show that the proposed design of the K-rails and concrete berms would withstand the wave action of wastewater in the event of a maximum credible earthquake per California Code of Regulations (CCR) Title 27 (T27) requirements.
23. How will the elevations along the tops of the modified berm be measured and documented considering the elevations along the tops of the pond berms currently vary, as mentioned in Section 6.2?

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24. Regarding the leachate collection and removal system (LCRS) specified in Section 17 of the final Abengoa Mojave Solar Project Commission Decision dated September 2010, how are leachate samples recovered from the LCRS?

25. The liner system proposed is a single 60 mil high-density polyethylene (HDPE) liner. Lahontan Water Board staff understands that the additional liner is intended for the freeboard portion of the pond only; however, all class II surface impoundments construction occurring after July 1997 must be in accordance with CCR T27. Per CCR T27, Table 4.1, a single liner for a class II surface impoundment is only permitted if it is a clay liner with a maximum hydraulic conductivity of 1×10^{-6} cm/sec. As described in Table 2.1, designated liquid waste contained in a class II surface impoundment must have a double liner system with a LCRS unless it meets the criteria in Table 4.1 note 6. It should be noted that clay liners are typically not permitted by the Lahontan Water Board due to the potential for desiccation fractures and other concerns of integrity occurring in the arid environment. Would the liner extension include the application of a clay liner? If not, would the liner extension use a doubled lined system or a singled lined system?

26. Though the table of contents references page numbers, the body of the document lacks page numbers. Please include page numbers in future deliverables.

27. In Section 1 (Definitions), the acronym MS is defined as Mojave Solar. In the text of Section 2, MS is defined as Mojave Solar LLC. Lahontan Water Board staff suggests using the Mojave Solar LLC definition in Section 2 for the definition of MS in Section 1.

(Ref. 1) (Technical Memorandum for Evaporation Ponds and Bioremediation Facilities. Gannett Fleming, May 1, 2012.)

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SOCIOECONOMICS AND TRANSPORTATION

Author: Steve Kerr

BACKGROUND

The project owner is proposing to extend the current liners in the lower elevation areas of the evaporation ponds by up to two feet. Construction of the liner extension would require contractors to visit the site as well as truck trips to transport equipment and materials.

DATA REQUESTS

28. What is the estimated number of workers required for installation of the extension liners? What is the estimated length of time required to complete the installation of the extension liners?
29. What is the estimated number of truck trips generated by the installation of the extension liners? How many, if any, oversized trucks would be used for the extension liners installations?