DOCKETED

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SUBJECT: Heat Transfer Fluid (HTF) Infiltration Incident at Genesis Solar Energy Project (GSEP) 09-AFC-8C

Mr. Goguts,

The California Energy Commission (Energy Commission) staff has completed its investigative inquiry since the incident of heat transfer fluid (HTF) infiltrating the evaporation ponds was first reported to us on October 13, 2014.

BACKGROUND

- As determined by GSEP operations staff, a small quantity of HTF (25 & 35 gallons) was introduced into the evaporation ponds primarily during two incidents that occurred in October 2013.
- The evaporation ponds avian exclusion netting was destroyed during a wind storm on August 3, 2014.
- HTF was first detected by smell at the ponds in October 2014, and after closer inspection, approximately 50 dead grebes contaminated with HTF were discovered in the ponds and reported.
- The ponds were cleaned in October 2014, and approximately 6,610 gallons of HTF was removed from the North pond and 96 gallons of HTF was removed from the South pond, indicating that unreported incidents of an unknown duration and/or frequency resulted in significantly larger quantities of HTF being deposited in the ponds.
- New avian exclusion netting was ordered with smaller mesh size (1-inch) and installed over the evaporation ponds in February 2015.

FINDINGS

Energy Commission staff's concerns focused on four technical areas for possible violations of Conditions of Certification, as follows:

- Biological Resources;

- Hazardous Materials Management;
- Soil & Water Resources; and
- Waste Management.

After evaluating the facts of the incidents reported and the October 2014 pond cleaning, a determination has been made that NextEra Energy Resources (NEER) was out of compliance with Energy Commission Condition of Certification **BIO-21** for not reporting on regular post-construction monitoring of the evaporation pond nets and for not reporting on dead or entangled birds. Under the Biological Resources (Required Actions) section of this letter, Energy Commission staff has identified required submittals necessary to rectify the non-compliance.

The biphenyl and diphenyl oxide components of HTF had the potential to adversely affect the environment at GSEP and elsewhere in two ways: first, for Soil and Water Resources, where HTF could potentially comingle with, and further degrade, the water quality; and second, for Biological Resources, where the HTF had the potential to affect wildlife. Our investigation has revealed that the protocols for separating the HTF from the comingled waste waters in the power blocks, following spillage or escape incidents, needs to be made more effective.

The presence of HTF in the evaporation ponds at other solar trough facilities licensed by the Energy Commission is not prohibited. In fact, it is known that some amount of HTF will be deposited in the ponds during normal operations. There has been, and is still, as per the design of the GSEP, an allowance for a small amount of HTF-contaminated runoff from the soil containment area to be deposited into the evaporation ponds. With this in mind, there is an acknowledgement on behalf of Energy Commission staff that in the future, small amounts of HTF in the evaporation ponds at GSEP will be an acceptable occurrence, not restricted solely to that HTF coming from the soil containment area. We further recognize that if the evaporation pond netting had been in place, barring the unforeseen destruction of the nets caused by the wind storm on August 3, 2014, the presence of the HTF in the ponds would almost certainly not have resulted in the bird deaths that were documented in the weeks and months following (approximately 50 initially reported on October 13, 2014).

Energy Commission staff is requesting that NEER continue to exercise caution to prevent HTF from entering the evaporation ponds unnecessarily in the future. The reason for this is that the presence of HTF in the evaporation ponds increases the hazard presented to wildlife in the event of failure of the nets. Hence, staff encourages the prevention of HTF transport to the ponds as being an inherently safer environmental practice. Under Hazardous Materials Management, (Requested Actions), Energy Commission staff is recommending implementation of Best Management Practices to maintain a high effectiveness for separating out HTF from wastewater sent to the evaporation ponds.

REQUIRED ACTIONS

Energy Commission staff is requiring the following actions for Biological Resources and Hazardous Materials Management:

Biological Resources

As per Biological Resource Condition of Certification **BIO-21**, regular post-construction monitoring of the evaporation pond netting was either not done, or was done and the required reporting not submitted to the Energy Commission Compliance Project Manager (CPM) at the required interval, constituting non-compliance of Condition of Certification **BIO-21**. To rectify this non-compliance, staff is requiring NEER to file quarterly monitoring reports for one year after installation of the new evaporation pond nets.

Beginning with the installation of the new avian exclusion netting, the Designated Biologist shall submit quarterly reports to the CPM of the regular monitoring of the evaporation ponds, netting, and dead or entangled birds for the period of February 2015 to February 2016. The first report is due to the CPM for 1st Quarter 2015 (January through March) within 30 days from the date of this letter.

Hazardous Materials Management

Staff has determined that NEER should have notified the local Certified Unified Program Agency (CUPA) for Riverside County of the unintended release of HTF to the environment once it was known that two conditions existed simultaneously: 1) HTF was contained within one or more of the ponds, and 2) the netting to prevent birds from coming into contact with the ponds were no longer functional. Because the ponds were known to have contained sixty or more gallons of spilled HTF since October 2013, and the nets were destroyed by a wind storm on August 3, 2014, the CUPA should have been notified at that point that there was an environmental exposure, in particular, an unplanned exposure of wildlife to HTF-contaminated pond water. This notification should have been made regardless of whether or not the release of HTF was considered a spill by GSEP operations staff. The important point to consider is that the report needs to be made to the CUPA to allow it to make the determination of the severity of the incident. The pertinent code section that requires such reporting can be found at California Code of Regulations, Title 19 Article 2 Section 2703, *Immediate Reporting of a Release or a Threatened Release*.

REQUESTED ACTIONS

Energy Commission staff is requesting that GSEP operations staff take the following actions for Soil & Water Resources and Hazardous Materials Management, to optimize facility safety and to help prevent future problems:

Soil & Water Resources

For soil and water, issues fall into two categories: 1) the significance of HTF in the ponds from a water quality standpoint; and 2) the need for an increased frequency of monitoring and/or expanded scope of monitoring of the ponds. In conjunction with, and with the concurrence of our joint enforcement authority, the Colorado River Regional Water Quality Control Board (CRRWQCB), the Energy Commission staff request the following measures be implemented at the GSEP for better future preparedness:

1) Water quality concerns due to presence of HTF in the ponds

Energy Commission and CRRWQCB staff agree that there was no release offsite of a contaminant, in this case HTF, as the ponds are a designed catchment for wastes; therefore, there was no unanticipated release to the environment. Both agencies agree that there are no concerns about water quality as a result of the incident. However, as previously mentioned, the CUPA should have been notified.

2) Future presence of HTF in the evaporation ponds

Energy Commission staff realizes that going forward small quantities of HTF will be present in the evaporation ponds. However, from a Best Management Practice (BMP) standpoint, both the CRRWQCB and the Energy Commission staff are requesting that additional monitoring be implemented to have a better understanding of how HTF might enter the ponds and how much is present at any given time. Please note that additional monitoring has been included through a revised Monitoring and Reporting Program (MRP) dated May 22, 2015, included as part of the Waste Discharge Requirements. No amendment to either the CRRWQCB Order or the Energy Commission conditions of certification are required.

Hazardous Materials Management

Oil and water separators (OWS) lose their effectiveness when the HTF is emulsified by pumping, or when hot HTF is introduced into the process because the difference in the relative density between water and HTF is reduced as temperature increases. Although Energy Commission staff is not familiar with the specifications of the particular OWS(s) in use at GSEP, in order to minimize the amount of HTF that may be introduced into the ponds, staff is recommending that any HTF collected in the secondary containment from spills or other sources be allowed to cool to ambient temperatures before it is processed through the oil and water separator, in order to maximize the effectiveness of the process.

To maintain the effectiveness of the OWS, the following general BMPs should be followed:

- The OWS should be maintained in a clean condition as they have limited capacity and reduced effectiveness when partially full of separated materials. If HTF is allowed to combine with lube oils, it may become impossible to separate;

- Flow rates through the OWS should be limited to no greater than the designed-for flow as the ability of the OWS to separate hydrocarbons from water degrades rapidly at flows greater than the designed-for flow;
- Flow pumps should be selected and located so as to prevent agitation and emulsification of hydrocarbons into the water before it enters the OWS. This may require that the pumps be located either far from or after the OWS. Otherwise, low agitation screw or piston type pumps should be used; and,
- Prior to washdown, use absorbent materials and sweeping to capture spilled HTF and oils before they can enter the flow to the OWS. Detergents and emulsifiers should be avoided during washdown as they prevent the OWS from separating out entrained hydrocarbons.

Waste Management

Based on the information provided by NEER and on our analysis, Energy Commission staff reached a conclusion that Condition of Certification **WASTE-11** was adhered to. As per the Environmental Protection Agency (EPA) Reportable Quantities (RQs), there was no unauthorized release.

NEXT STEPS

Within 30 days of receipt of this incident report, staff requests NEER address the required and requested actions presented in this report and provide a plan for their timely completion. If you would like to discuss this report with the staff, please feel free to contact me at (916) 654-4611 or eric.veerkamp@energy.ca.gov.

Sincerely,

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Compliance Project Manager

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