DOCKET
09-RENEW EO-1
DATE NOV 20 2009
RECD. NOV 20 2009

November 20, 2009

California Energy Commission
Dockets Office, MS-4
Re: Docket No. 09-Renew EO-01
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: Docket No. 09-Renew EO-01—Renewable Energy Executive Order

To Whom it May Concern:

We appreciate the opportunity to provide comment to the California Energy Commission Draft Staff Report Best Management Practices & Guidance Manual: Desert Renewable Energy Projects ("Draft BMPs"). Ram Power develops geothermal energy projects domestically in the west as well as abroad. Currently, we have several 49.9 MW projects in various stages of planning in the Imperial Valley, California. Our comments specifically address issues that we will have or believe we may have if the Draft BMPs are implemented in our project areas. Our comments are as follows:

General Comments: Many suggested Best Management Practices ("BMPs") in the Draft BMPs are relevant in scenarios that are not specifically outlined in the document. A regulator who chooses to apply these BMPs without the appropriate technical background or without engaging in the appropriate analysis may cause increased costs and project delays that could jeopardize projects. Simply cutting and pasting BMPs without understanding the potential ramifications of doing so is inappropriate.

Comments on Consultation Timelines

General Activity Pre-Application Activity Guidance beginning page 9-27 -- The timelines suggested for various agency and utility consultations in the Draft BMPs represent best-case scenario timelines. These suggested timelines are appropriate as long as they remain suggested timelines not a mandated consultation time period. Geothermal projects typically require agency consultations early for exploration activities. Consequently, agency contact often occurs early. However, idealistic mandatory prefiling timelines would likely cause delays and may jeopardize completion of projects.

Comments on Zoning

Page 2, Lines 34-37; Page 8, Lines 27-31; and Page 17, Lines 12-19 -- This BMP suggests locating projects on properties that do not require a zone change. This requirement assumes that the counties have conducted an appropriate resource identification and have made the requisite zoning changes. This comment also assumes that the counties will continue to evaluate the resources and change zoning on their own as technology changes and more resources are financially feasible. Geothermal resources are located in areas having very specific geological criteria. While it is very convenient to discover a utility grade resource that is already within an appropriately-zoned site, zoning should not be a primary resource identification criteria.

Comments on CEC Geothermal BMPs – Air Quality

Page 51, Lines 4-6 – Imperial County APCD Rule 207.C.1.c requires the application of Best Available Control Technology to any new or modified Emissions Unit with a Potential to Emit equal to or greater than 55 lbs/day. This is not specific to geothermal power plants.

Page 51, Lines 7-16 – These suggested BMPs are more properly within the jurisdiction of the appropriate air pollution control district. Fluid and gas samples need not be collected and tested from every well, as air pollutant emissions from individual wells in liquid-dominated geothermal projects occur only during well flow testing, and not every well is flow-tested.

Page 51, Lines 17-19 – This BMP is not appropriate. Dictating the ownership of the components of a geothermal project is normally not within the jurisdiction of any environmental regulatory agency. Further, the need for this BMP, to ensure that the responsibility for control of H2S emissions from the geothermal well field and pipelines is not lost, is not a real issue since nearly all geothermal powerplants today have both the plant and wellfield under a single operator. Ownership is a legal issue governed by the project financing structure.

Page 51, Lines 20-25 – Again, this suggested BMP is more properly within the jurisdiction of the appropriate air pollution control district. Few geothermal power plants emit enough H2S, or are located in proximity to any odor receptors, to justify the installation and operation of H2S and meteorological monitoring stations. The need for such data collection should be determined on a case-by-case basis, and only if there is sufficient information to justify the concern for odor problems.

Page 51, Lines 26-36 – The suggested H2S abatement technologies are likely not the best available control technologies for many geothermal projects. The determination of the best available control technology, or whether any abatement of H2S is required at all, is more properly within the jurisdiction of the appropriate air pollution control district.

Page 51, Lines 32-34 - The determination of the best available control technology, or whether any abatement of H2S is required at all, is more properly within the jurisdiction of the appropriate air pollution control district. Further, the suggested H2S abatement technology is not technologically feasible for the abatement of hydrogen sulfide emissions from the flow testing of the hypersaline geothermal brines, as the addition of NaOH to the hypersaline geothermal brines would immediately initiate the precipitation of many compounds, producing substantial quantities of likely hazardous wastes which would fill and clog test equipment and damage well bores and geothermal reservoir fractures.

Comments on CEC Geothermal BMPs – Noise

Page 53, Line 18 - There is no direct correlation between the number of drill sites and the number people that may be impacted by noise. Impacts are related to the distance between noise sources and sensitive noise receptors. This BMP should be deleted.

Page 53, Line 19 - Geothermal wells must be located where the resource is believed to be located. As such, the suggested BMP should be revised to state "Locate the sites as far from residences as practical, considering the location of the geothermal resource."

Page 53, Lines 21-23 - Noise is attenuated with distance, but a two-mile distance in which drilling and construction activities would need to be restricted is unnecessary and has no basis in acoustic science. It would be better to tie any restriction on hours of activity to a traditional maximum noise level standard, such as the day night equivalent level (Ldn), used as a noise standard by the EPA and most counties and cities in California.

Page 53, Lines 24-25 - Geothermal well drilling is typically short-term and temporary. There is no justification for the excessive cost that would be associated with a requirement to install acoustical windows in structures of "affected parties." At what noise level can an entity claim to be an "affected party?" Depending on the construction of a given structure, it is not even clear that acoustical windows would even be effective as a noise barrier. This BMP should be deleted.

Page 53, Lines 26-31 - There is no definition for "adequate noise abatement" and it has no meaning without some standard. This BMP should be amended to restrict noise levels at the identified sensitive receptor locations to some maximum allowable ambient noise standard(s). Further, the standards for construction noise, which is short-term and temporary, should differ from long-term operational noise. The equipment examples provided could still be included in the BMP as suggestions of the kind of noise abatement equipment that might be used.

Comments on CEC Geothermal BMPs – Hazards, Pesticides and Waste Management BMPs:

Page 51, Line 40 – The suggested BMP is unclear and/or poorly written. Most geothermal fluids require no or very little treatment prior to injection, and only the hypersaline brines in some portions of the Imperial Valley require the removal (through reactor clarifier systems) of silica prior to injection. This BMP should be deleted or substantially reworded to clarify its intent and applicability.

Page 52, Lines 1-2 - This is an inappropriately worded BMP. Steam condensate is almost always used as the primary cooling water makeup source from flash geothermal plants, and this BMP must be worded so that it could not be interpreted as prohibiting this. There may also be opportunities for the recovery of minerals or other byproducts from the geothermal brines, which could be prohibited under the current wording of this BMP.

Page 52, Line 16-20 - There is no recognized training called "hazardous waste management." If the intent is for HAZWOPER training as prescribed under the OSHA Hazardous Waste Operations and Emergency Response Standard, then that should be stated.

Page 52, Line 21-24 - While it may be useful to periodically conduct environmental audits and formally identify all hazardous waste streams, it is unnecessary to prescribe this as an annual requirement. A better BMP would simply state "Conform to all applicable federal, state and local requirements regarding the handling of hazardous materials and hazardous wastes."

Page 52, Lines 25-27 - Geothermal brine impoundments in California have been considered Class II surface impoundments with freeboard requirements prescribed by the applicable Regional Water

Quality Control Board. It is not appropriate for this BMP to ignore the jurisdiction of these Regional Boards.

Page 52, Lines 28-30 - Class II surface impoundments are required to contain a leak detection system - stating this regulatory requirement as a BMP makes no sense. This BMP should be deleted.

Page 52, Lines 31-32 - Class II surface impoundments are required to install and monitor ground water monitoring wells - stating this regulatory requirement as a BMP makes no sense. This BMP should be deleted.

Page 52, Lines 33-34 - This BMP is very ambiguous, as it does not make clear what "conveyance systems" must be cleared of scale. Assuming that the discussed "conveyance systems" are the geothermal fluid pipelines, a more appropriate BMP might state "Clean all fluid pipelines at intervals sufficient to prevent the buildup of silica scale that could clog the pipelines and result in releases of silica scale and other materials from the pipelines."

Page 52, Line 35 - In many cases it is not possible to perform geothermal pipe maintenance anywhere except where the pipe is installed. This BMP should instead simply state "Perform pipeline de-scaling operations in areas designated for de-scaling activities."

Page 52, Line 36-40 - This BMP will not work for all geothermal facilities. For example, most geothermal power plants do not have a geothermal brine surface impoundment. The BMP should be more generic and simply state "Contain all fluid from hydro blasting areas and prevent the fluid from infiltrating the ground surface."

Page 52, 41-43 - This "BMP" is actually an opinion and not a BMP. The BMP should simply state "Contain all drilling muds and cuttings." Clay- or plastic-lined basins have been safely used for drilling the vast majority of geothermal wells in California with Regional Water Quality Control Board oversight and without incident. There are many cases where it is impractical to containerize and store the large volume of drilling mud and cuttings generated during well drilling.

Comments on CEC Geothermal BMPs – Water/Brine Injection

Page 54, Lines 3-42 – Most of the suggested BMPs are already statutory or regulatory requirements of the California Division of Oil, Gas and Geothermal Resources (CDOGGR) – it makes no sense to recite them as "BMPs," and they should be deleted.

Page 54, Lines 17-19 – The suggested BMPs should be deleted as they are not, in fact, best management practices. These measures, and any number of additional measures, could be taken to reduce or eliminate adverse uplift determined to be associated with geothermal injection wells, but only after it has been determined that injection from a geothermal project has, or is in the process or, producing undesired surface uplift. It would not be appropriate to require the implementation of these measures before operation of the project as "BMPs."

Page 54, Lines 20-21 – The suggested BMP is not feasible and cannot be implemented. "Near" is not a defined term, and geothermal fluids cannot be injected without increasing the original pore pressure in the rock. CDOGGR is, by statute and regulation, required to review and approve each geothermal injection well and geothermal injection project proposed in the state prior to implementation, and it should be left to CDOGGR to review the detailed plans for these operations and make the appropriate determinations as to these issues. This BMP should be deleted.

Comments on CEC Geothermal BMPs –Water Supply

Page 55, Lines 5-7 – Geothermal flash-steam plants typically utilize geothermal fluid steam condensate, not geothermal fluid, as the major source of cooling water. However, this condensate often contains elevated concentrations of ammonia which feeds the buildup of ammonia-loving bacteria found in the windblown dust in many desert environments. These bacteria can heavily foul, and not be effectively removed from, the packing in the highest efficiency cooling towers. This dissolved ammonia is also difficult and very expensive to remove from the steam condensate before discharging it into the cooling tower (ion exchange), or the removal would render the condensate unusable for cooling tower makeup water (high pH adjustment). Thus, a slightly more open cooling tower fill is required for geothermal power plant cooling towers using geothermal steam condensate with elevated concentrations of ammonia.

Page 55, Lines 8-19 – This BMP appears to be written backwards. What should be stated first is that binary power plants should use degraded or reclaimed water sources for geothermal-source water supplies, as much as possible, and that they should minimize the use of fresh water supplies. What should follow are the BMPs suggested to accomplish this. These can include the use of air-cooled condensers; the use of air-cooled condensers using one of the listed pre-cooling strategies; or the use of dual cooling systems (consisting of an under-sized wet cooling system and an undersized air-cooled system). Requiring the use of specified systems based on the seasons is not rational – these decisions need to be made on the basis of engineering evaluations of multiple criteria (temperature, wet bulb temperature, wind speed, energy demand, etc.).

We appreciate the opportunity to provide these comments. If you have any questions, comments, or concerns, please do not hesitate to contact us.

Sincerely,

Stuart Johnson
Vice President Geothermal Resources
Ram Power