



November 20, 2009

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

DOCKET	
09-RENEW EO-1	
DATE	<u>11/20/2009</u>
RECD.	<u>11/20/2009</u>

**Re: Docket Number 09-Renew EO-01, “Renewable Energy Executive Order”
 Comments on “Best Management Practices and Guidance Manual: Desert
 Renewable Energy Projects, Draft Staff Report,” Publication # CEC-700-2009-
 016-SD**

Dear Renewable Energy Action Team (REAT):

Ormat Nevada, Inc. (Ormat) respectfully submits the following comments on the *Best Management Practices and Guidance Manual: Desert Renewable Energy Projects, Draft Staff Report*, dated October 5, 2009. Thank you for the opportunity to comment on this first draft document.

ABOUT ORMAT

Ormat is an international renewable energy company, with our headquarters in Reno, Nevada.

Ormat is a vertically-integrated company whose primary business is to develop, build, own and operate geothermal and recovered energy generation (REG) power plants utilizing in-house designed and manufactured equipment. In addition, Ormat supplies geothermal and recovered energy power generating equipment of its own design and manufacture, and complete power plants incorporating its equipment on a turnkey basis, as well as small size power units for remote continuous unattended operation. Therefore, Ormat not only develops and operates geothermal power plants, but we also design and build the equipment. Most of Ormat's products and business activities are based on its original Ormat Energy Converter (OEC), a field-proven technology for utilization of low and medium temperature heat sources. Ormat is the world leader in Organic Rankine Cycle (ORC) power systems.

Ormat's geothermal power plants are a field-proven, mature commercial product operating worldwide, designed for outdoor installation and remote control unattended operation. Ormat has successfully supplied approximately 1100 MW of geothermal power plants, based on its proprietary technology, logging millions of hours of operating experience.

Ormat owns and operates geothermal project complexes in California, with several being located in Imperial County and one in Mono County. We also have another 3 geothermal complexes in Nevada, and one in Hawaii. Worldwide, we also own geothermal plants in Nicaragua, Guatemala, Kenya, and New Zealand.

ORMAT Nevada

6225 Neil Road, Reno, NV, 89511-1163 • Telephone (775) 356-9029 • Facsimile (775) 356-9039

Ormat also performs some solar development, but our comments in this letter are focused on aspects affecting geothermal development, the primary focus of our business in the U.S.

GENERAL COMMENTS

While we understand that this document was prepared to “facilitate the issuance or required permits for a project and improve the efficiency and speed of the regulatory process” (Executive Summary), there are some requirements in it that are overly restrictive, go beyond what is currently required by law, regulation, and typical permit standards, and in fact, some of the BMPs would be prohibitive to further development of new geothermal plants, primarily of the organic rankine cycle type of plant. This would be contrary to the goals of Executive Order # S-14-08.

Page 5 of the Executive Summary also states that the manual complements existing National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) guidance and that implementing the practices in the manual will support efforts to comply with NEPA, CEQA, and other laws. However, Ormat understands that some agencies may rely on this manual to be the authoritative document on mitigation measures for renewable energy projects, so the recommendations in this manual may become “requirements” rather than suggested possible BMPs. BMPs by nature are not always feasible, but if agencies are relying on this document as requirements, they will be pointed to measures that are not always feasible and, thus, may pose significant costs or prohibitions on projects. It is, therefore, imperative that this document is accurate and only contains realistic, practical measures, which it currently does not.

Many of the practices in the manual are taken from other plans, policies or project-specific permits, often without the flexibility or context of the original document or project. For example, there are some BMPs in the document that were requirements for a steam project in The Geysers; however, these practices are impractical or infeasible to work in other types of geothermal projects, especially binary plants in the Imperial Valley. Some of the BMPs are simply too site-specific to work for all geothermal resources and should, therefore, not be applied across the board to all geothermal projects.

In some cases, the manual has suggestions that, as far as we know, have never been actually incorporated into an existing geothermal project. While offered as guidance, there is always the possibility that agencies will adopt these measures as actual mitigation and conditions of approval.

The manual should, therefore, be very clear and duplicated throughout the document something to the effect of “any BMPs listed herein are only provided as examples of maximum mitigation and would not always be feasible to all projects. Prior to requiring any of the BMPs in this document, the user must perform a site- and project-specific evaluation on the technical and economic feasibility of the measure.”

Our comments below point out some of the measures that seem overly restrictive, inappropriate, or too site-specific to say that they are practical BMPs that can work on every geothermal project. We also provide comments with technical and even a few editorial corrections.

We also would like to point out that there are a few places in the document that states or implies that the BMPs can or would be applied toward modifications of existing plants; this should not be the case, as the focus of the manual is on permitting new facilities, not retrofitting existing ones. We point out a few places where we noted this is implied.

GENERAL COMMENTS REGARDING USE OF WATER

The Manual (page 2) recommends that projects "not use fresh ground water or surface water for power plant cooling," and (page 23) that power plants only use "air-cooled technology or recycled/impaired water (no fresh groundwater or surface water) for cooling." However, for geothermal, it later (page 55) allows that binary geothermal plants can improve plant electrical efficiency by using one of three pre-cooling strategies during the summer season.

We are bringing up a point about water usage before comments on the rest of the document because these statements and BMPs are prohibitive to the growth of this industry and the technologies listed in the BMPs are not mature enough or practical. For example, hybrid cooling is only in experimental stages in geothermal plants, and it is not rational to recommend using a technology that is not proven or mature yet. Furthermore, new power plant design is based first on the geothermal resource available, and we can not simply build a dry cooled power plant (that will cost more per MWH/yr) instead of a wet cooled one with the same output. As the BMP Manual states in Appendix B, plant electrical output can drop by 50 percent or more on hot summer days. Ormat's calculations also show similar figures in that reduction in power output of an air-cooled binary plant vs. a water cooled plant during the summer season. This reduced output and efficiency would make binary type plants prohibitive to build in hot climates such as Ormat's area of focus in Imperial County. The advantage of binary power plants is to take advantage of lower temperature resources that steam and flash plants cannot, so if binary plants cannot economically be built, California would be losing a large potential electrical generation from these lower temperature resources. Binary geothermal plants also have the lowest carbon dioxide emissions of all the types of geothermal power plants. Prohibiting this technology would be contrary to the goals of Executive Order # S-14-08.

Further specific comments and recommendations on this topic are provided below for the comments and recommendations on Page 2, Line 19.

PAGE-SPECIFIC COMMENTS

Page 2, Lines 16 – 18

Comment: This line combined with previous paragraph, indicate that these processes will only speed development on REAT identified land. Since there has been no study yet, this cannot be a best management practice. Additionally, it is likely that there will be other suitable lands, especially on private land, that will not be in the REAT-identified lands. The Imperial County Planning and Development Department has already designated the land classification for many sections in Imperial County.

Recommendation: This requirement should be deleted at least until such time lands are in fact established; if it is left in for future reference, it should at least indicate that there may be other parcels of land not identified by REAT that will be suitable for energy development.

Page 2, Line 19

Comment: "The project will not use fresh ground water or surface water for power plant cooling." This appears to be a summary of the State Inland Water Policy that the CEC has been implementing, with varying success, for several decades. Many projects licensed by the CEC have ended up using reclaimed water or poor quality water for cooling, but some projects have been able to demonstrate that their proposed use of surface or groundwater water sources will not have significant impacts. Additionally, in

other sections (page 9, lines 1-3; and page 23, lines 36-39) of the manual, it suggests that use of fresh water is possible but will require more time for permitting. This requirement could be prohibitive for new projects as it is not always feasible for other alternatives such as those listed on page 23. Hybrid and dry cooling are not economically viable options in the hot climates of the desert. Binary air-cooled system is not a technology that can be effective in a desert environment and it requires water for cooling to be feasible in this climate. Additionally, if dirty water is recommended to be used instead of fresh water, the cost to purchase and operate water treatment technology such as reverse osmosis could be completely cost prohibitive to a project. Furthermore, the definitions of fresh ground water and surface water should be clarified.

Recommendation: Delete this sentence (number 2) as it is prohibitive and not practical. A flat out prohibition on use of water for cooling would prohibit geothermal development. Otherwise, at least first further define “fresh ground water and surface water.” Do you mean a groundwater aquifer that meets EPA drinking water standards or another definition? Similarly for surface water; if there is an impaired source of surface water or a source of surface water that has been shown to have an adequate supply under an SB 610 water analysis, could it be used? If any reference to other cooling technologies (other than wet cooling) or to other sources of water (such as recycled or impaired water) are made, it should be stated that technical and economic feasibility should be considered prior to a complete prohibition on the use of “fresh” water cooling, and then it should be stated that if use of other water sources and/or cooling technologies are not feasible, groundwater or surface water may be utilized (See Geothermal Power Plant Cooling systems on pages 78-79).

Page 2, Lines 36-37

Comment: It is possible to develop a geothermal well field among lands that are under Williamson Act contract without impacting the ability to farm the land. Many projects have overcome these hurdles. Additionally, the local agency could easily remove areas of issue or will allow for exceptions – this should not be a flat-out prohibition. Often Williamson Act lands include areas that are not being farmed as they are used to store equipment or support the farming operation in another way. In Imperial County it is necessary for land to be zoned with a Geothermal Overlay Zone, g-zone. Only areas that were designated by the USGS in the 1970’s and for which the county did a Master EIR have this designation. For example, the Truckhaven resource is not currently a G-zone and will require zoning change.

Recommendation: Delete this sentence entirely, as it is unnecessarily prohibitive, and will be addressed during permitting by the local agency.

Page 2, Line 38

Comment: Addressing “All” the requirements of the DOD prior to permitting initiation is not possible since the purpose of CEQA and NEPA is to identify impacts which potentially change the project.

Recommendation: Reword to state that the project proponent should meet with any local DOD operation to insure their operations and concerns are addressed in the proposed project design.

Page 2, Line 40

Comment: Given the current cost and time delays with the utilities completing interconnection requests it is not practical that the interconnection study will be complete prior to submitting applications for a project. Developers start working on project prior to completing the CAISO studies. This requirement is unnecessary and could delay all projects by months. See also related comments below on Page 8, Lines 34-39.

Recommendation: Delete this sentence entirely.

Page 2, Line 44

Comment: The utilities are not being timely issuing PPAs given all the renewable energy resources that have responded to their RFPs, real or not. Given all the needs for renewable energy there should be options if a specific PPA does not come together.

Recommendation: Delete this sentence entirely or give options in case a PPA has not been executed yet.

Page 3, Line 1

Comment: A Determination of Compliance is a specific CEC document and is not applicable to a project not under CEC jurisdiction.

Recommendation: Clarify that this is only for projects under CEC jurisdiction filing an AFC.

Page 3, Line 2

Comment: There is likely no project that would not create air emissions either during construction or operation.

Recommendation: Delete the end of this sentence.

Page 4, Line 36

Comment: In general we don't find the manual to be flexible for siting a renewable energy project and the information requests outlined are onerous and add time and costs to what all ready are expensive projects.

Recommendation: Change the tone and the BMPs in the manual, along with adding clarifications that these are worst-case BMPs and that prior to requiring them in a project, they should be independently verified to be technologically and economically effective, practical, and necessary for each individual project.

Page 4, Line 35-36

Comment: The BMP provides guidance for applications from Project Developers and regulatory agencies for new projects. However, Page 5, Line 11-13, States that the BMPs are for the post-application phases (permitting/ pre-construction, construction, operation, repowering, or retrofitting, and decommissioning) of desert renewable energy facilities.

Recommendation: Clarify these contradictory statements.

Page 8, Lines 7-9

Comment: The Imperial County Planning and Development Department has already designated the land classification for many areas in Imperial County. Additionally, because there has been no study yet, this cannot be a best management practice. Additionally, it is likely that there will be other suitable lands, especially on private land, that will not be in the REAT-identified lands.

Recommendation: This requirement should be deleted at least until such time lands are in fact established; if it is left in for future reference, it should at least indicate that there may be other parcels of land not identified by REAT that will be suitable for energy development.

Page 8, Line 10

See comments and recommendations on Page 2, Line 19 above.

Page 8, Lines 29-30

See comments and recommendations on Page 2, Lines 36-37 above.

Page 8, Line 32

See comments and recommendations on Page 2, Line 38 above.

Page 8, Lines 34-39

Comment: Given the transmission planning currently underway via RETI and the Federal government it is not possible for an individual project to know if it will negatively impact the system. Additionally, how would “negatively impact” be determined? The delay in the interconnection studies by the utilities is only adding to this problem. There is obviously not adequate transmission capacity in California to accommodate the renewable energy required by either the RPS or AB 32 goals. The industry is trying to help the state meet its goals but requirements like this are not helpful. All project sites will require transmission capacity and would want to be located near transmission corridors to minimize interconnect costs. See also related comments above on Page 2, Line 40.

Recommendation: Remove this item completely, as it is prohibitive to the industry.

Page 8, Line 40.

See comments and recommendations on Page 2, Line 44 above.

Page 8, Lines 41-43

See comments and recommendations on Page 3, Lines 1 – 2 above.

Page 9, Line 6

Comment: Since ROW with BLM is not always required, the “and” should be an “or”

Recommendation: replace with “... a ROW application to BLM, or an application ...”

Page 10, Line 7-8

Comment: Meetings with the Energy Commission are only required for power plants of 50 MW or more.

Recommendation: Due to the Geothermal Element in the Imperial Valley, if a project is below 50MW, there is no need to file an application with the Energy Commission. Should change wording to reflect 50MW or more.

Page 10, Lines 23 – 25

Comment: ACOE permitting will not be applicable to all projects.

Recommendation: Add in “if applicable” to this sentence.

Page 10, Lines 37 – 40

Comment: There is no such agency as “State Department of Environmental Health & Environmental Protection.” Also, there are no permitting requirements of FEMA.

Recommendation: Delete Item #14.

Page 10, Lines 1-44.

Comment: In a perfect world these Pre-Application timelines would be desirable; however, projects are not this well defined this far in advance and, thus, these timelines, especially in Items 2 and 3 Lines 1 – 6), are not practical. For geothermal projects, leasing and exploration are often required before development is proposed. These activities (leasing and exploration) often require a permitting process too. Until wells are drilled a project cannot be completely defined and this is usually going on simultaneously. Even if all processes were done in tandem, a 24 month minimum preparation time with additional time for data collection if required for site specific data is not acceptable – the purpose of this

manual is to help expedite permit processing and project approval, not slow the process down. In addition to the long lead times being suggested here, we are also concerned about the request for extensive communication with full disclosure with a variety of entities. Because of lack of confidentiality agreements with such a large constituency (especially the local community in Item 15), this has the added requirement that all items that may be subject to competitors or artificial “profiteers” must be secured or obtained before the process begins (i.e. land purchases, PPA’s etc).

Recommendation: Remove all the timelines on this page, and make it more of a list of meetings or discussions with the various agencies that can be (but not required to be) done. Indicate that confidentiality agreements may be necessary in some cases.

Page 10 – 11, Item 15

Comment: For large and controversial projects, advance meetings with the community would be very helpful to a project, but not for smaller or noncontroversial projects.

Recommendation: State that this is only a suggestion, and suggested only for large and/or controversial projects.

Page 11, Lines 26 – 33 (Items 3 and 4)

Comment: Setting up meteorological and ambient air monitoring stations is useless for some renewable energy projects (including binary geothermal plants) and of course expensive; should not be a blanket requirement.

Recommendation: Delete these two items, or at least specify which types of projects this applies to.

Page 11, Lines 36 – 39

Comment: The commentary “(dissolved chemicals – salts, toxic compounds, and biocides – in large water droplets)” is unnecessary and needs to be removed. The assumption is that the document is directed at a technically savvy audience and does not need to be clarified what cooling tower plume is.

Recommendation: Delete the referred-to words in Lines 37 – 38; actually, in the comment below, we request that Items 6 and 7 be deleted entirely.

Page 11, Lines 36 – 42; and Page 12, Lines 1 – 4 (Items 6 and 7)

Comment: Computer modeling of cooling tower drift and of other emission sources (including fugitive dust) has not been required of geothermal projects under the the authority of the Imperial County Air Pollution Control District, as it is recognized that it would be overkill. These modeling requirements appear to be duplicated from CEC requirements for large power plants and do not apply to renewable energy plants, including geothermal. The purpose of geothermal plants, especially binary plants, is to have far less emissions than combustion-oriented power plants (such as coal, gas, biomass, waste). Additionally, Item 6 would require extensive site-specific cooling tower engineering that is not normally available 12 months before an application is submitted.

Recommendation: Delete Items 6 and 7 completely, as they are overkill and not necessary or applicable for renewable energy projects (geothermal, wind, and solar).

Page 12, Line 7

Comment: This implies there will be a cooling tower source test requirement, and not clear if it also implies continuous monitoring (which there is no continuous monitor for H₂S from geothermal cooling towers). This could be a significant burden on older cooling towers. Additionally, similar to the comment above, none of Ormat’s plants currently have sampling monitors as they are unnecessary on our types of plants.

Recommendation: Delete this item (#9).

Page 12, Line 14 (“delivery of consumables”)

Comment: This is currently not done by facilities. There is no testing and/or estimation of delivery of consumables. This is a serious burden if constant or may end up placing a facility over emissions requirements before they even start.

Recommendation: Delete the phrase, “delivery of consumables.”

Page 12, Lines 16 – 19 (Item #12)

Comment: The Authority to Construct is not always complete when a Conditional Use Permit is applied for at the county level. Any other agency permits contain the information they need to evaluate the project and they do not need the detailed engineering contained in an ATC for their evaluation. Additionally, there may be proprietary information in an ATC application that will not be outlined in a general permit application.

Recommendation: Remove this requirement for projects outside of CEC jurisdiction.

Page 13, Lines 1 - 2

Comment: “Meeting” with local governments to determine this is not necessary, as this information will come out during the biological surveys.

Recommendation: Delete this item (#2).

Page 13, Line 14

Comment: Designing facilities to discourage their use as perching or nesting substrates by birds could be burdensome and unnecessary.

Recommendation: Delete this item.

Page 13, Line 27

Comment: Generally, all documentation is submitted to the lead agency who then distributes to all appropriate agencies.

Recommendation: Change wording to, “Submit survey protocols to the designated lead agency, who will distribute to the appropriate agencies, i.e BLM, CDFG, FWS.”

Page 13, Line 29

Comment: There appears to be a typographical error, “FWD” should be “FWS.”

Recommendation: Change FWD to FWS.

Page 14, Lines 7-46

Comment: There are two paragraphs designated as “10”).

Recommendation: Items on pages 14 and 15 should be renumbered 11 through 17.

Page 14, Line 10

Comment: Raven management plans are not necessary in areas that do not support ravens or desert tortoises.

Recommendation: Change the wording on Line 10 to, “If in an area of raven and desert tortoise habitat, submit a draft common raven ...”

Page 14, Lines 29 – 39 (Item 10)

Comment: Information on ponds are submitted for review and analyzed by the RWQCB, and should not be included in this document. These details are not usually available at the time of application.

Recommendation: Delete this item.

Page 14, Lines 40 – 42 (Item 11)

Comment: Geothermal injection should be considered a ZLD. Other types of ZLD still have solid byproducts.

Recommendation: Replace "...using modern and cost effective zero liquid discharge (ZLD) technologies" with "using modern zero liquid discharge (ZLD) technologies, including geothermal injection."

Page 15, Line 10

Comment: This paragraph discusses burrowing owl translocation. We understand that CDFG does not allow physical handling of owls, so this would not be applicable.

Recommendation: Change the wording of this item to: "If wildlife species, such as burrowing owl, will need to be relocated through artificial burrow installation and passive closure of active burrows, prior to project construction, develop a draft Burrowing Owl Mitigation and Monitoring Plan, and provide ."

Page 16, Lines 13 – 22

Comment: Adequate information on the proposed transmission interconnect should be provided for the lead and responsible agencies to analyze the project under CEQA and/or NEPA. However, the entire Interconnection Study is not needed. Additionally, given the delays with interconnection requests the approval of a control agency may not come until the project siting process is well under way. This will delay projects even more.

Recommendation: Remove the requirement for the Interconnection Study to be submitted with project applications and the approval letter from the appropriate control agency. Also remove all areas referencing CAISO leaving only "the appropriate control agency."

Page 16, Lines 24 – 31 (Item 1)

Comment: A Phase I site assessment shouldn't be required for projects on greenfields/undeveloped land.

Recommendation: Clarify that site assessments should be done only for projects on previously developed or disturbed lands, if necessary and appropriate.

Page 17, Lines 7-11

Comment: The avoidance of Williamson Act Lands by geothermal projects may not be possible since geothermal resources cannot be moved. It is possible to develop geothermal resources in and around Williamson Act Lands without impacting them and thus, requiring termination of the contract by the landowner. It is important to know what lands are under contract in designing the well field and to work with the landowners to mitigate any concerns.

Recommendation: Line 8 change the work "must" to "may."

Page 17, Lines 36 - 38

Comment: This is not really applicable in the desert region of interest for renewable energy projects, and this data has not been required by local planning agencies.

Recommendation: Delete this item (#10).

Page 17, Lines 43 - 45

Comment: Locating facilities more than 0.5 miles from sensitive receptors is not necessary if it is determined there is no significant noise impact to those receptors.

Recommendation: Delete this item (#1).

Page 18, Lines 1 - 6

Comment: Should not define what a significant noise level is, as this (significance criteria) should be determined on a site-specific basis and in conjunction with the local agencies (if on private land) or with the BLM (if on BLM lands). The 5 – 10 dBA increase is not always applicable as the significance threshold especially in the rural or remote areas of the desert.

Recommendation: Remove the clause, “(no more than a five to 10 dBA increase above ambient levels)” and possibly replace with “(per applicable significance criteria and/or as determined with the responsible planning agency).”

Page 18, Line 8

Comment: There are not paleontological resources “everywhere” throughout the desert area and some projects may not involve significant earthwork, so hiring a paleontologist is not necessary for some project locations.

Recommendation: Clarify in this sentence to retain the services if applicable, if the project site is in an area known to have paleontological resources and the scale of the project could possibly impact these resources.

Page 19, Lines 22 - 29

Comment: This is all overkill at least for geothermal projects (they have a minimal footprint on soils, minimal disturbance to soils). Soils information can be obtained from the Resource Conservation Service’ Soil Survey.

Recommendation: Delete Items 1 – 4, or at least state they are not applicable to geothermal projects.

Page 19, Lines 24 -27

Comment: Projects are required to create and operate under a Fugitive Dust Control Plan to mitigate dust. Given the number of dirt roads in the desert either used for agriculture or Off-road vehicle use, the amount of dust generated by these renewable energy projects is minimal as compared to existing conditions.

Recommendation: Remove this requirement if a Fugitive Dust Control Plan is developed and approved by the APCD.

Page 19, Line 30

Comment: It is expensive to prepare a complete grading plan for a conceptual project that may change during the CEQA/NEPA review including the site location.

Recommendation: In Line 30 change the word “complete” to “conceptual.”

Page 19, Lines 34-36

Comment: Neither the SWRCB nor the RWQCBs require submittal of a draft or final SWPPP. The SWPPP is only required to be present for review when and if the site is visited by these agencies.

Recommendation: Delete this sentence.

Page 21, Line 31-32

Comment: Form 7460 can be filed on-line and approvals or required changes by the FAA all completed on-line too.

Recommendation: Add website for filing FAA notifications and approvals, <http://oeaaa.faa.gov>

Page 23, Lines 12 - 24

Comment: Section includes a lot of design criteria that needs to be adjusted. One area of significance, is the requirement of burying cables. We have previously used cable tray at many sites. This area needs clarification.

Recommendation: Remove the requirement for burying cables, and provide more clarification to this section.

Page 23, Line 26

See comments and recommendations for Page 2, Line 19 above.

Page 23, Lines 45-46

Comment: Developers should identify wastewater treatment and pre-treatment measures to be included as part of the facility's NPDES Permit.

Recommendation: Water treatment is controlled by the Regional Water Quality Control Board via the facility's Waste Discharge Order (WDO). A facility will not have a NPDES Permit if it does not discharge to drains or if it is at zero Liquid discharge.

Page 24, Lines 39 - 42

Comment: One year of data collection prior to groundwater collection could be too lengthy for some projects that are currently in the planning and permitting stages, and could also be too long for other newly proposed projects.

Recommendation: Delete the requirement of "a minimum of one year of data."

Page 25, Lines 1-5

Comment: This item appears to be requesting a SB 610 Water Supply Assessment which would address several of information requests.

Recommendation: Clarify if a SB 610 Water Supply Assessment is what is requested or some other type of analysis.

Page 25, Line 11

Comment: The Imperial Irrigation District has indicated they do not issue "will serve" letters anymore, they issue water supply contracts.

Recommendation: Delete "will serve" and from this item.

Page 25, Lines 15 - 16

Recommendation: Add the qualifer, "...when economical and feasible" at the end of the sentence.

Page 26, Lines 16-18

Comment: The exact location of wells is not always known during the early stages of permitting a power plant. The proposed locations and well construction and drilling program for the project can be given but if this is a complete "green field" the exact locations and drilling program may change as wells are drilling and more information is gained on the resource. Well information is usually held confidential by

CDOGGR, SLC or BLM when the permit application is submitted for the period of time allowed by the regulations. Additionally, for geothermal wells on Federal Geothermal Leases, Geothermal Drilling Permit (GDP) applications are submitted to the U. S. Department of the Interior, Bureau of Land Management (BLM) for approval, not the California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR).

Recommendation: Submit proposed well locations and construction methodology in permit applications but not actual permit applications. Also, delete “SLC” and change the wording to, “Change the wording to “...(DOGGR) if on private land, or if on public land, the Bureau of Land Management (BLM), for the geothermal test, production...”

Page 26, Line 19

Comment: For binary plants, these should be called “brine lines.”

Recommendation: “...for the steam supply or brine pipelines.”

Page 26, Lines 19-21

Comment: Building Permit applications for construction of a pipeline are not usually submitted until CEQA and/or NEPA is complete as well as preconstruction environmental studies. Pipeline locations for either brine or injection fluids may change as the wells are drilled and the resource is defined.

Recommendation: Permit applications should show proposed routes and construction but not actual building permit applications.

Page 26, Line 27

Comment: Geothermal resources are developed where they are found. Thus, it is not always possible to locate facilities downwind of population centers. It would be more appropriate for jurisdictions to not permit homes, schools or other sensitive receptors in order to facilitate the development of geothermal resources for RPS and other state and national needs and goals.

Recommendation: State that to the extent possible site geothermal projects away from populated areas. Local planning agencies should also not permit sensitive receptors near known geothermal resources.

Page 26, Lines 22 - 23

Comment: The EPA protocols rely on factors developed at refineries, which are not necessarily representative of geothermal conditions.

Recommendation: Remove the requirement to use USEPA developed protocols, as they are not representative of geothermal projects. Instead, indicate that where possible, geothermal projects should use actual or estimated data from similar projects.

Page 28, Line 4

Comment: We would argue against the notion that many of these proposed BMPs are either effective or economically feasible across all geothermal resources. Many BMPs are resource specific but have not been defined as such in the document.

Recommendation: Rewrite the definition of BMP.

Page 28, Lines 13 - 14

Comment: Implies BMP may be applied to repowering retrofit and operation. Could affect current facilities.

Recommendation: Delete this sentence.

Page 28, Line 22

Comment: Many of the BMPs outlined for geothermal resources are very site specific as explained further in this comment letter.

Recommendation: See other comments and recommendations; remove BMPs that have come from site-specific documents.

Page 29, Lines 29 – 39 (Item 8)

Comment: “Use off-road construction diesel equipment that has a rating of 100 hp to 750 hp and that meets the Tier 3 California Emission Standards for Off-Road Compression Ignition engines.” The actual regulations require that all new equipment meet these requirements, but many construction contractors use older equipment that has less restrictive requirements. If taken literally, this measure would require that all construction equipment meet the newest standards which is not required and not feasible.

Recommendation: Delete this item or at least clarify it is only for NEWLY purchased equipment.

Page 29, Lines 6 (Item b) and 9 (Item d)

Comment: Unposted county or BLM roads may be dirt (such as projects located in remote areas) and we have no jurisdiction to set speed limit, default is 35mph. Enforcement on non-owned roads is not feasible.

Recommendation: Delete these items, or at a very minimum, indicate “where required and feasible.”

Page 29, Lines 18 – 19 (Item i)

Comment: This appears to be a spill prevention item not a dust control item. For this whole section, we can only do items for roads that are directly owned by us.

Recommendation: Delete item (i) and indicate in all applicable items that these BMPs only apply to roads directly owned by the energy company.

Page 30, Lines 27 – 31 (Item 8)

See comment and recommendation for Page 23, Lines 12 – 24 above.

Page 30, Lines 32 – 34 (Item 9)

Comment: This item seems to require total designation of project area, it is impractical to confine project vehicles to this area as access areas may extend outside.

Recommendation: Clarify that this is only applicable to the actual construction site, and not extend to areas outside of it.

Page 31, Lines 19 - 20

Comment: This should only apply to the site as company personnel only have jurisdiction within company property. This is a policing action and should not apply everywhere.

Recommendation: “While on company property, prohibit workers ...”

Page 31, Lines 43 - 45

Comment: This sounds like a new reporting requirement. Because this is under a section regarding a qualified biologist, does it mean constantly contracting someone to do our reports? It seems to imply even during operation, not just construction.

Recommendation: Delete this BMP or clarify when and where it is applicable.

Page 33, Line 3 (Item g)

Comment: There should be more flexibility with this.

Recommendation: Change wording to "...weed-free straw, hay bales, or equivalent..."

Page 33, Line 14

Comment: to clarify that topsoil does not have to be certified weed free, also.

Recommendation: Reclamation of all areas of temporarily disturbed soil using topsoil salvaged from all excavations and construction activities and using certified weed free native vegetation.

Page 34, Line 4

Comment: Aerial photos are not always available; it is easier to enter gps coordinates on a google map

Recommendation: Aerial photographs or available Google maps

Page 34, Line 40

Comment: if there is no standard, it will be difficult to know when reveg is complete

Recommendation: Revegetation, to 40% of original vegetation density as determined in a baseline survey made prior to disturbance,

Page 35, Lines 6 – 8 (Item 26)

Comment: This line ("project modifications or expansions and the closure/decommissioning phase ...") clearly states that all items under biological resources section that are done during construction should also apply to all phases of the project except operation.

Recommendation: Delete this line, as this document applies to new projects, not to modifications and expansions.

Page 36, Lines 37 -41

Comment: the CA burrowing owl guidelines define a preconstruction survey as one site visit as required by project-specific mitigations not by four site visits. Projects typically conduct only one preconstruction survey for burrowing owls. The proposed number of surveys would be a problem for large projects that have staggered construction start dates for different areas, spread over a number of months. This wording does not follow Consortium or the CDFG 1995 Memo guidelines. Mitigation is only required within 250 feet of an existing active burrow. If the survey is only done 30 days prior to construction, there is the possibility of mitigation requirements that cannot be met.

Recommendation: Replace with this new wording: "Initial burrowing owl and burrow surveys should be conducted during both the wintering and nesting season, unless the species is detected on the first survey. If possible, the winter survey should be conducted between December 1 and January 31 and the nesting survey between April 15 and July 15. A preconstruction survey should consist of a follow up site visit to determine if any new burrows or owls have located within the area and be performed at least 30 days prior to surface disturbance. Any disturbances within 250 feet of an active burrow should be mitigated. Survey techniques and mitigations should follow guidelines found in CDFG Memorandum, Staff Report on Burrowing Owl Mitigation, 1995. When possible, this survey could be combined with Desert Tortoise surveying as both surveys are looking for burrows."

Page 37, Line 12

Comment: this guideline would essentially prohibit activities for 9 months.

Recommendation: Unless the area has desert tortoise exclusion fencing or has been cleared by a Authorized Biologist, conduct project

Page 38, Line 46

Comment: The first line should be consistent with the other species-specific sections.

Recommendation: Replace “Mohave ground squirrel qualified biologist” with just “qualified biologist.”

Page 40, Lines 38 - 39

Comments: The term “nonhazardous product substitutes” is vague and this requirement is not feasible.

Recommendation: Delete “nonhazardous product substitutes” or at a minimum replace with “...use of nonhazardous products when feasible...”

Page 42, Lines 43 - 45

Comment: The time limit is not always feasible. These mitigation measures will come out during CEQA or NEPA anyway.

Recommendation: Delete this BMP, or add an exception such as “when feasible or possible.”

Page 43, Lines 20 - 22

Comment: These are not always feasible or even necessary.

Recommendation: Provide more flexibility such as “when necessary and feasible and practical.”

Page 44, Lines 9 - 11

Comment: The last sentence is not relevant.

Recommendation: Change, “All equipment access doors should be locked to limit public access” to “When equipment is outside of perimeter fencing or controlled barriers, all equipment access doors should be locked to limit public access.”

Page 47, Line 3

Comment: Form 7460 can be filed on-line and approvals or required changes by the FAA all completed on-line too.

Recommendation: Add website for filing FAA notifications and approvals, <http://oeaaa.faa.gov>

Page 51, Line 6

Comment: Imperial County's Geothermal Element was updated in 2006 and is currently under revision.

Recommendation: Contact Imperial County for the most recent Geothermal Element/reference

Page 51, Lines 7 - 16

Comment: The local APCD's usually have a requirement to sample the well fluids and gases once they are drilled and tested. However, this information is not available at the early stages of permitting a project such that an actual emission inventory could be prepared. If available, historical data is used or data is estimated based on what the resource is expected to be based on the geology of the area.

Recommendation: Add a sentence that the data may be hypothetical based on the data currently available.

Page 51, Lines 17 - 38

Comment: The air quality section suggests abatement measures that do not reflect actual conditions, are not site- and project-specific, some are contradictory, and should not be dictated by this document. Abatement measures are determined following technical and cost feasibility considerations in coordination with the local air district. Examples of the site-specific and/or contradictory BMPs:

- Item 2, “Own both the geothermal production and injection wells ...” This was an issue at The

Geysers years ago and is not longer applicable as it is no longer a model used in geothermal projects.

- Item 3, “As an integral part of an odor control program, implement an ambient monitoring program for H₂S and meteorology. ...” Such a program has been found necessary at some, but not all geothermal areas. Furthermore, in Imperial Valley, the local Air Pollution Control District (APCD) controls the meteorological stations and they are not necessarily near power plants. The owner/operator of the power plant does not have access to the stations. In the past, the geothermal industry gave money to the County to purchase and operate such stations.
- Item 4, “Remove H₂S from both the condensate and noncondensable gas (NCG) stream by processing the NCG in a thermal oxidizer. ...” Thermal oxidizers are only used at a few plants in some areas and do not abate the condensate. Furthermore, this BMP dictates the type of chemical to use for this activity, whereas that should be determined on a case-specific basis.
- Item 5, “When present in large volumes in the NCG stream, remove H₂S with a liquid redox system.” Such a system is only used at some geothermal projects, but it is not necessary at all projects.
- Item 8, “Inject hydrogen peroxide and sodium hydroxide into a well’s test line to abate H₂S emissions.” Again, this type of abatement is only required in some districts, and is not applicable or feasible at all projects. Furthermore, this BMP dictates the type of chemical to use for this activity, whereas that should be determined on a case-specific basis.
- Lines 26-38 are all resource-specific H₂S abatement treatments and quite overcommitted, and they are not applicable, necessary, or feasible at all geothermal areas.

Recommendation: Delete Lines 17 – 38 and replace with “The proper abatement system(s), if any required, should be determined by the local air district, based on specific resource characteristics, facility emissions, and the local APCD’s rules and regulations.”

Page 51, Line 39

Comment: The section is designated as “Hazards, Pesticides, Waste Management” but pesticides are not included in any of the items in this section.

Recommendation: Rename the section as “Hazards and Waste Management”.

Page 51, Line 40

Comment: Brine treatment is site specific and pH increase might work in a few geothermal locations but would cause calcite scale or carbonate precipitation in many other geothermal areas. This item would also require high expenditure when it is not necessary. This is another BMP that is too site-specific to say it is a BMP for all geothermal resources, and it also is not relevant to environmental protection.

Recommendation: At a minimum, change the wording to "Treat spent geothermal brine to keep minerals in solution prior to reinjection"; however, we suggest this item to be deleted as it is too site-specific.

Page 52, Lines 16 – 20 (Item 7)

Comment: This might be a good idea but our binary system waste management don’t involve high pressure and high temperature steam. This seems to be written for steam systems, not applicable to binary plants.

Recommendation: Delete this item, or state that it is only applicable to steam plants.

Page 52, Lines 21 - 24 (Item 8)

Comment: Environmental audits are good practice, but these are usually done under confidentiality.

Recommendation: Delete this item, or state that the environmental audit program as well as its results are

kept confidential and cannot be shared with anyone.

Page 52, Lines 28-30

Comment: Title 27, California Code of Regulations (CCR), requires that a geothermal brine surface impoundment, or Waste Management Unit (WMU), have two non-pervious liners installed with a leachate collection system installed between the top and bottom liners and three monitoring wells around the perimeter of the WMU. It should also be pointed out that these systems can be expensive and should only be used where necessary and required by the RWQCB.

Recommendation: Item 10 should read “If required by the RWQCB, install a leak detection system beneath the top membrane liner and above the second non-pervious liner of the geothermal brine....” Better yet, delete this line as it will be up to the RWQCB to require this or not, after evaluating the characteristics of the specific resource, the materials in the impoundment, and the soils and groundwater.

Page 52, Lines 31-32

Comment: A groundwater well (Sweetwater well) provides groundwater and is not the same as a groundwater monitoring well. Additionally, this item implies that geothermal brine is a hazardous waste which is not the case. It may contain metals that may give it hazardous waste characteristics. Furthermore, it will be up to the RWQCB to determine if any groundwater monitoring wells are required and what the monitoring frequency should be. The need for groundwater monitoring wells is a site-specific decision, not applicable to all areas and projects.

Recommendation: Rewrite the sentence to “Any groundwater monitoring wells must be sampled per any permit requirements to determine whether the geothermal brine surface impoundment is leaking” or, as with the above comment and recommendation, delete this item as it will be determined by the RWQCB after their evaluation.

Page 52, Lines 33- 35

Comment: Cannot move geothermal piping and or equipment requiring maintenance and de-scaling to any designated area because they are permanently installed. De-scaling must be done in place. Additionally, these items appear to be directed at high scale steam lines, not contained brine as with binary type systems.

Recommendation: change to read “when possible, perform pipe maintenance and de-scaling in designated areas for steam and flash plant systems (not applicable to brine lines).”

Page 52, Lines 36 - 40

Comment: This appears to be a Salton Sea-specific measure and does not apply to other geothermal projects in the State. Surface impoundments are not always required for hydroblasting runoff.

Recommendation: Delete this measure or clarify that that these practices apply only to projects in the Salton Sea.

Page 53, Noise section

Comments: The noise section [page 53] suggests mitigation that does not consider specific equipment and site conditions. Noise requirements should be based on the applicable local noise standards. Imperial County has noise requirements specific to geothermal exploration and development.

Recommendation: Remove specific restrictions, and refer to the Imperial County noise requirements specific to geothermal exploration and development.

Page 53, Lines 22

Comment: Shutting down drilling operations to avoid noise is not a safe or practical solution depending on what is going on in the drilling operation. There are noise abatement measures that are commonly used to abate noise from drilling operations.

Recommendation: Delete the last sentence and state that noise abatement techniques such as installing hay bales around the location, should be used to mitigate noise from drilling operations.

Page 53, Lines 24 – 25 (Item 3)

Comment: This seems to dictate installation of sound proof windows, which is never required for a temporary operation such as exploration and testing that this item is for. There are other BMPs that would work for temporary and construction operations.

Recommendation: Delete this BMP.

Page 53, Lines 21 – 23

Comment: “Within two miles of existing, occupied residences, consider restricting geothermal well drilling or major facility construction activities to non-sleeping hours (7 a.m. to 10 p.m.)” This measure is also in the Programmatic Environmental Impact Statement for Geothermal Leasing. Drilling is routinely performed 24 hours/day, even in the most sensitive locations, and other measures are usually adopted to mitigate drilling noise, where necessary. Such a measure, if implemented, would add considerably to the cost of drilling, which is one of the most expensive elements of geothermal development. It would also lengthen the drilling schedule.

Recommendation: Delete this BMP.

Page 53, Line 37-39

Comment: In the Imperial Valley, a flash geothermal power plant cannot satisfy the water supply needs, including cooling tower make-up water, throughout the summer months and requires an additional source of make-up water. Both the Heber 1 and the GEM 2&3 flash plants require additional make-up water from the nearby canals. See description for “Geothermal Power Plant Cooling Systems” on pages 78-79.

Recommendation: Delete or clarify sentence.

Page 53, Line 42 – 44

See comments and recommendations on Page 2, Line 19 regarding the use of dry cooling in the desert.

Page 55, Line 8-19

Comment: Due to extreme heat conditions, air-cooled condensers are not efficient in the Imperial Valley or anywhere in the desert region. The listed summer season technologies are not mature enough or practical. Furthermore, new power plant design is based first on the geothermal resource available, and we can not simply build a dry cooled power plant (that will cost more per MWH/yr) instead of a wet cooled one with the same output. See comments and recommendations for Page 2, Line 19.

Recommendation: The air-cooled only option is not feasible for the Binary system in desert climate, as somewhat discussed on pages 78-79. Delete all of Item 2. See also our recommendations with regards to Page 2, Line 19.

Page 55, Lines 12 – 14 (Item a)

Comment: A deluge system is not practical and requires a lot of water to deluge and later to clean.

Recommendation: Delete this item

Page 58, Lines 27-28

Comment: This is not the most current reference for California Burrowing Owl.

Recommendation: Add the following reference: CDFG Memorandum, Staff Report on Burrowing Owl Mitigation, 1995

Page 59, Line 4-7

Comment: The Imperial Irrigation District has recently completed an Interim Water Resource Plan allocating water for industrial users. This is a more recent water supply document for Imperial County than this reference.

Recommendation: Replace this reference with the more current Imperial Irrigation District Plan.

Page 66, Line 4

Comment: Geothermal wells may also be permitted by the California State Lands Commission or Bureau of Land Management depending on the land owner. Additionally, EPA has jurisdiction for Class V injection wells on federal lands. There is an MOU between EPA and CDOGGR giving them oversight on injection wells on non-federal lands.

Recommendation: Add CSLC and BLM to this sentence.

Page 66, Line 6-8

Comment: For geothermal wells on Federal Geothermal Leases, Geothermal Drilling Permit (GDP) applications are submitted to the U. S. Department of the Interior, Bureau of Land Management (BLM) for approval, not the California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR).

Recommendation: After the word “fluids” insert the words “not applicable to BLM Lands”.

Page 66, Lines 1-13

General Comment: In Imperial County, the Imperial County Planning and Development Department will be the lead agency on the permitting of any Power Plant in this Valley below 50 megawatts due to the Geothermal Element granted to the County by the CEC to permit locally any project below 50 megawatts. We hope that this permitting process will continue the same manner, as some of the projects mention in the BMP's are large projects like Unit #6 in the Salton Sea.

Page 77, Lines 32-33

Comment: Given that the largest operating geothermal field in the world is The Geysers which is steam dominated this is an incorrect statement.

Recommendation: Delete the sentence

Page 78, Line 12

Comment: This sentence implies that projects are air cooled due to insufficient water; however, in some areas the metrological conditions allow for air cooling without impacting the economics of the project.

Recommendation: Research other resources to insure your citations are correct.

Page 79, Line 3

Comment: Because binary plants do not consume geothermal resource water as flash or steam plants, binary plants require more make-up water for cooling. The amount of make-up water stated here is likely for flash plants, as it is low compared to our data for binary projects specifically in the extreme heat of the Imperial Valley area.

Recommendation: Obtain updated data (we can provide upon request) for estimated make-up water required for binary geothermal plants in the desert area.

Page 79, Line 10

Comment: Use of nonfresh water can be preferred, but not always available nor technically or economically feasible.

Recommendation: Add a qualifer at end of sentence, “...., use of nonfresh water is preferred when available and technicologically and economically feasible.”

Page 79, Line 19

Comment: This assumes that all geothermal brines have heavy metals in hazardous concentrations. This is incorrect.

Recommendation: Change the word “is” to “maybe” hazardous in toxic concentrations.

Page 79, Line 37

Comment: This appears to be a Salton Sea-specific measure and does not apply to other geothermal projects in the State. Surface impoundments are not normally used for hydroblasting runoff.

Recommendation: Clarify that that these practices apply only to projects in the Salton Sea.

Page 80, Line 3

Comment: This Monofill is only permitted to take materials from CalEnergy’s facilities. It is not a public facility.

Recommendation: Clarify the ownership and who the materials are coming from.

Page 80, Lines 14-17

Comment: The BLM, CSLC, EPA and RWQCB’s may also have oversight on what is injected. CDOGGR only has jurisdiction on fee lands. The RWQCB’s have jurisdiction from the power plant to the well head. EPA has oversight for Class V wells on other federal lands.

Recommendation: Clarify this section with the information above.

Thank you again for the opportunity to comment on the draft BMP and guidance document. If you have any questions or comments about any items in this letter, please contact either Ron Leiken at (775) 336-0173 (or e-mail at rleiken@ormat.com) or Charlene Wardlow at (775) 336-0155. We are also open to meeting with you in person to go over our comments and any questions you may have.

Thank you for your assistance.

Respectfully,

Signed, hard copy submitted to CEC

Ohad Zimron
Vice President, Operations