UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

MAR 28 2011

Colleen Sievers
BLM Carson City District, Stillwater Field Office
5665 Morgan Mill Road,
Carson City, Nevada 89701

Subject: Draft Environmental Impact Statement (DEIS) for the Salt Wells Energy Projects, Churchill County, NV (CEQ# 20110018)

Dear Ms. Sievers:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the Salt Wells Energy Projects, Churchill County, Nevada. Our comments are provided pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), Section 404 of the Clean Water Act, and our NEPA review authority under Section 309 of the Clean Air Act.

EPA supports increasing the development of renewable energy resources in an expeditious and well planned manner. Using renewable energy resources such as geothermal can help the nation meet its energy requirements while minimizing the generation of greenhouse gases. While renewable energy facilities offer many environmental benefits, they are not without the potential for adverse impacts. Appropriate siting and design of such facilities is of paramount importance if the nation is to make optimum use of its renewable energy resources without unnecessarily depleting or degrading its water resources, wildlife habitats, recreational opportunities, and scenic vistas.

We have rated the DEIS as Environmental Concerns – Insufficient Information (EC-2) (see enclosed "*Summary of Rating Definitions*"). We have particular concerns about the potential impact of the proposed Project to waters of the United States. We understand that the jurisdictional delineation of waters of the United States has not been finalized and the full extent of impacts has not been determined. Based on the preliminary analysis in the DEIS, however, the impacts appear to be concerning, especially within an arid ecosystem. EPA strongly encourages BLM to demonstrate that the proposed Project is the *Least Environmentally Damaging Practicable Alternative* (LEDPA). To accomplish this, we recommend the FEIS modify project alternatives to avoid and minimize impacts to waters of the United States, and describe mitigation measures for remaining unavoidable impacts.

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EPA recommends the FEIS also include additional analysis on air quality, water resources, geological hazards, best management practices, biological resources, invasive species, cumulative impacts, climate change, and hazardous waste, as well as the evaluation of an environmentally preferable alternative. Our enclosed detailed comments provide additional information regarding these concerns.

We appreciate the opportunity to review this DEIS and are available to discuss our comments. Please send two hard copies of the FEIS and two CD ROM copies to this office at the same time it is officially filed with our Washington D.C. Office. If you have any questions, please contact me at (415) 972-3545, or Scott Sysum at (415) 972-3742 or sysum.scott@epa.gov.

Sincerely,

Tom Kelly

for Kathleen M. Goforth, Manager
Environmental Review Office
Communities and Ecosystems Division

Enclosures: Summary of EPA Rating Definitions
EPA's Detailed Comments

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

Category "1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category "2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category "3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

US EPA DETAILED COMMENTS ON DRAFT ENVIRONMENTAL IMAPCT STATEMENT (DEIS) FOR SALT WELLS ENERGY PROJECTS IN CHURCHILL COUNTY, NV, MARCH 28, 2011

Project Description

The three proposed projects, referred to as the Salt Wells Energy Projects (Project), could provide up to five commercial geothermal power plants with a maximum total net output of 160 megawatts (MW). In addition, the Project would include a new 22-mile 230 kV transmission line with associated substations and facilities. The Project area encompassed by the three proposals covers approximately 24,000 acres located about 15 miles southeast of the city of Fallon, NV and could require approximately 70 wells (32 previously approved) with associated pipelines. The proposed development has the potential to result in increased employment opportunities and local government tax revenues. The individual energy projects have an expected operating lifetime of at least 20 – 40 years.

Water Resources

Clean Water Act (CWA) Section 404

The Environmental Protection Agency (EPA) is concerned about the potential permanent impacts to 39 acres of perennial wetlands, estimated by contractors, which would result from the Project, as proposed. For context, wetlands cover less than one percent of Nevada, providing important habitat for the state's fish and wildlife. Wetlands provide stopover and breeding grounds for migratory waterfowl (Elko County Water Resource Management Plan). Also, as stated on page 3-74 of the DEIS, the Carson Lake and Pasture area is a 30,000-acre wetland that is a component of the Western Hemisphere Shorebird Reserve Network. The U.S. Fish and Wildlife Service (USFWS) estimated that from the 1780's to the 1980's, 52% of Nevada's wetlands were lost[1]. Conversion of wetlands to cropland and diversion of water for agricultural and urban purposes are the primary reasons for the loss of wetlands. These aquatic resources provide a wide range of functions that are critical to the health and stability of the aquatic environment.

We understand that the jurisdictional delineation is not complete and has not been verified by U.S. Army Corps of Engineers (USACE). The DEIS does state that the USACE has may assert jurisdiction over wetlands associated with the Newlands canals (at p. 3-74). Additionally, during a discussion of playas, it is stated that while the USACE may assert jurisdiction over playas and wetlands "as special aquatic sites," the USACE is not expected to assert jurisdiction over these sites since they do not abut and have no surface connection to Waters of the US (WUS) (at p. 3-78). Ultimately, the DEIS does not confirm whether USACE has asserted jurisdiction, nor does the DEIS include a detailed description of impacts to WUS.

[1] Dahl, Thomas E. 1990. Wetlands losses in the United States 1780's to 1980's. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Online. http://www.npwrc.usgs.gov/resource/wetlands/wetloss/index.htm (Version 16JUL97).

Recommendations:
The Final Environmental Impact Statement (FEIS) should include a jurisdictional delineation for all WUS, including ephemeral drainages, in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* and the December 2006 *Arid West Region Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region.* A jurisdictional delineation will confirm the presence of WUS in the Project area and help determine impact avoidance or if state and federal permits would be required for activities that affect WUS.

The FEIS should describe all WUS that could be affected by the Project alternatives, and include maps that clearly identify all WUS within the Project area. The discussion should include acreages and channel lengths, habitat types, values, and functions of these WUS.

The purpose of the CWA is to restore and maintain the chemical, physical, and biological integrity of WUS. These goals are achieved, in part, by prohibiting discharges of dredged or fill material that would result in avoidable or significant adverse impacts on the aquatic environment. Pursuant to Section 404 of the CWA, discharge of dredged or fill material to WUS requires a permit issued by the USACE. If a permit is required, EPA will review the Project for compliance with the *Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials* (40 CFR 230) (Guidelines), promulgated pursuant to Section 404(b)(1) of the CWA. The burden to demonstrate compliance with the Guidelines rests with the permit applicant. The Guidelines contain four main requirements that must be met to obtain a Section 404 permit:

a) Section 230.10(a) prohibits a discharge if there is a less environmentally damaging practicable alternative to the proposed Project.
b) Section 230.10(b) prohibits discharges that will result in a violation of water quality standards or toxic effluent standards, jeopardize a threatened or endangered species, or violate requirements imposed to protect a marine sanctuary.
c) Section 230.10(c) prohibits discharges that will cause or contribute to significant degradation of waters. Significant degradation may include individual or cumulative impacts to human health and welfare; fish and wildlife; ecosystem diversity, productivity and stability; and recreational, aesthetic or economic values.
d) Section 230.10(d) prohibits discharges unless all appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem.

Recommendation:
Discuss and demonstrate compliance with the Guidelines in the FEIS.

Identification of the Least Environmentally Damaging Practicable Alternative– 40 CFR 230.10(a)

In order to comply with the Guidelines, the applicant must comprehensively evaluate a range of alternatives to ensure that the *"preferred"* alternative is the *Least Environmentally Damaging Practicable Alternative* (LEDPA). Identification of the LEDPA is achieved by

performing an alternatives analysis that estimates the direct, indirect, and cumulative impacts to jurisdictional waters resulting from a set of on- and off-site Project alternatives. Project alternatives that are not practicable and do not meet the Project purpose are eliminated. The LEDPA is the remaining alternative with the fewest impacts to aquatic resources, so long as it does not have other significant adverse environmental consequences. Only when this analysis has been performed can the applicant and the permitting authority be assured that the selected alternative is the LEDPA (40 CFR 230.10(a)).

As currently proposed, we cannot determine whether or not the preferred alternative represents the LEDPA. It is not possible to determine the LEDPA in the absence of an approved determination of the geographic extent of waters of the U.S. on the Project site. Further, the extent to which jurisdictional waters are avoided is not evaluated within the DEIS. The DEIS does provide detailed information on the potential for reconfiguration or redesign of the Project layout, Project boundary roads, drainage channels and pipelines that could result in avoidance of jurisdictional waters. The DEIS does not discuss the feasibility of constructing a smaller-sized Project that would have fewer environmental impacts. Based on the information in the DEIS, it appears that a smaller Project alternative, or alternative layout, may be practicable and less environmentally damaging to jurisdictional waters when compared to the proposed Project alternatives.

Recommendations:
EPA recommends that the Bureau of Land Management (BLM) include analyses of additional on- and off-site alternatives in the FEIS and identify the LEDPA. The alternatives should encompass a reasonable range of Project sizes and configurations that could be less environmentally damaging, while meeting the purpose and need of the Project. Sufficient detail should be provided to allow for meaningful comparisons.

The FEIS should discuss the steps taken to avoid and minimize impacts to WOUS. To the extent any aquatic features that could be affected by the Project are determined not to constitute waters of the United States, EPA recommends that the FEIS characterize the functions of such features and discuss potential mitigation.

Minimize Potential Adverse Impacts and Mitigation – 40 CFR 230.10(d)

Pursuant to the Guidelines, mitigation of project impacts begins with the avoidance and minimization of direct, indirect, and cumulative impacts to the aquatic ecosystem, followed by compensatory measures if a loss of aquatic functions and/or acreage is unavoidable. Compensatory mitigation is, therefore, intended only for unavoidable impacts to waters after the LEDPA has been determined. For this reason, it would be premature to examine in detail any mitigation proposal before compliance with 40 CFR 230.10(a) is established.

The DEIS does not demonstrate that all practicable measures to minimize unavoidable impacts to potential WUS have been incorporated into the proposed Project design. We believe there may be Project designs that avoid and minimize direct, indirect, and cumulative impacts to potential jurisdictional waters, for example, by reducing the fill footprint, and if necessary,

constructing drainage channels with natural features. The DEIS provides no assessment of the cumulative impacts on WUS of the proposed Project and other proposed projects in the area. Finally, the DEIS includes no compensatory mitigation measures for potential impacts to jurisdictional waters. In short, the Project appears not to comply with EPA's Guidelines, nor with the USACE's and EPA's regulations governing mitigation under Section 404 of the CWA.[2]

Recommendations:
In the FEIS, discuss the steps taken to avoid and minimize impacts to WUS. To the extent any aquatic features that could be affected by the Project are determined not to constitute WUS, EPA recommends that the FEIS characterize the functions of such features and discuss potential mitigation. Additionally recommend BLM commit to maintain a 650 ft buffer along the canal as part of all alternatives considered in the FEIS and recommend BLM consider, as part of their alternatives analysis, eliminating development or any disturbance west of the canal adjacent to the perennial wetland area identified on page 3-74.

Include in the FEIS a mitigation plan for unavoidable impacts to WUS, as required by USACE and EPA regulations.

Include a Best Management Practice (BMP) for the use of a composite mat system, for drill pads and temporary roads, as is commonly used in the oil and gas industry, for construction in wet meadow areas. The FEIS and Record of Decision (ROD) should commit to all measures which minimize soil erosion and avoid impacts to vegetation and wildlife including limiting construction within any wet meadow area be conducted during periods when dry conditions exists as stated in the DEIS on page 4-56.

Drainages, Ephemeral Washes, and Floodplains

Natural washes perform a diversity of hydrologic, biochemical, and geochemical functions that directly affect the integrity and functional condition of higher-order waters downstream. Healthy ephemeral waters with characteristic plant communities control rates of sediment deposition and dissipate the energy associated with flood flows. Ephemeral washes also provide habitat for breeding, shelter, foraging, and movement of wildlife. Many plant populations are dependent on these aquatic ecosystems and adapted to their unique conditions. The potential damage that could result from disturbance of flat-bottomed washes includes alterations to the hydrological functions that natural channels provide in arid ecosystems, such as adequate capacity for flood control, energy dissipation, and sediment movement; as well as impacts to valuable habitat for desert species.

Recommendations:
To the extent any aquatic features that could be affected by the Project are determined not to constitute WUS, EPA recommends that the FEIS characterize the functions of such features and discuss potential mitigation.

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[2] Compensatory Mitigation for the Loss of Aquatic Resources, Final Rule, 33CFR 325 and 332, April 10, 2008.

To avoid and minimize direct and indirect impacts to desert washes (such as erosion, migration of channels, and local scour):

- do not place support structures in washes or desert dry wash woodlands,
- utilize existing natural drainage channels on site and more natural features, such as earthen berms or channels, rather than concrete-lined channels,
- commit to the use of natural washes, in their present location and natural form and including adequate natural buffers, for flood control to the maximum extent practicable,
- reconfigure the Project layout, roads, and drainage channels, as applicable, to avoid ephemeral washes, including desert dry wash woodlands within the Project footprint, and
- minimize the number of road crossings over washes and design necessary crossings to provide adequate flow-through during storm events.

Water Supplies

Public drinking water supplies and/or their source areas often exist in many watersheds. Source water is water from streams, rivers, lakes, springs, and aquifers that is used as a supply of drinking water. Source water areas are delineated and mapped by the state for each federally-regulated public water system. The 1996 amendments to the Safe Drinking Water Act (SDWA) require federal agencies to protect sources of drinking water for communities.

Recommendation:

The FEIS should identify:

- source water protection areas within the Project area;
- activities that could potentially affect source water areas;
- potential contaminants that may result from the proposed Project; and
- measures that would be taken to protect the source water protection areas.

On page 1-13 Table 1-1 the DEIS states there is a need for an Underground Injection Control (UIC) permit for the Project. In the DEIS there is no further mention of the UIC permit or the requirements for the permit.

Recommendation:

The FEIS should also discuss compliance with the applicable regulations pertaining to the Underground Injection Control Program of the Safe Drinking Water Act.

On page 4-48 and 4-49 the DEIS states: "Mitigation of potential impacts on groundwater, springs, and other surface water features can be addressed by development of monitoring plans for these water resources. The plans would provide for the collection and evaluation of data necessary to document baseline conditions and impacts on the resources (i.e., water quantity, quality, and temperature). Monitoring wells can be installed in different aquifers for measuring water levels and quality characteristics, as necessary or required. Frequency of monitoring would be sufficient to document potential seasonal changes in the resources. Contingencies can be

developed (e.g., modification of geothermal pumping rates) to address any potential impacts that may be documented during the monitoring program."

This statement indicates that groundwater impacts from the use of geothermal fluids or reinjection of the fluid could be addressed by a monitoring plan, but does not state that a monitoring plan will be developed or implemented. As part of a nearby Enel Green Power Stillwater geothermal plant, Churchill County included a requirement to develop a groundwater monitoring plan[3] as part of a special use permit for the plant.

Both the Ormat and Vulcan plants would require cooling water sourced from non-thermal groundwater and/or geothermal water. The DEIS states that for the Ormat facility the rate of water consumption for cooling will range from 2,500 to 3,500 gallons per minute (gpm) from April to October. For the Vulcan facility the rate of water consumption for cooling will range from 2,000 to 3,400 gpm per binary plant. If all four plants are built the maximum rate of water consumption would be 8,200 gpm.

Recommendations:
The FEIS should describe the availability of a water supply for construction and operation of the proposed Project and fully evaluate the environmental impacts associated with using the selected water supply.

The FEIS should indicate that a groundwater monitoring plan will be developed and implemented for both the Ormat and Vulcan projects as a mitigation measure for potential impacts on groundwater, springs, and other surface water features. The monitoring plans should address contingencies to be implemented (e.g., modification of geothermal pumping rates) to address any potential impacts that may be documented during the monitoring program plan for these water resources.

Fencing
The DEIS does not provide detailed information about fencing that will be utilized for the Project, nor the effects of fencing on drainage systems. In this region storms can be sudden and severe, resulting in flash flooding. Fence design must address hydrologic criteria, as well as security performance criteria. The National Park Service recently published an article[4] on the effects of the international boundary pedestrian fence on drainage systems and infrastructure. We recommend that BLM review this article to ensure that such issues are adequately addressed.

Recommendation:
The FEIS should provide more detailed information on the proposed fencing design and placement, and its potential effects on drainage systems on the Project site. Ensure that fencing proposed for this Project will meet appropriate hydrologic, wildlife protection

[3] Enel Stillwater, LLC, Groundwater Monitoring Plan Associated with Churchill County SUP, November 5, 2008
[4] National Park Service, August 2008, Effects of the International Boundary Pedestrian Fence in the Vicinity of Lukeville, Arizona, on Drainage Systems and Infrastructure, Organ Pipe Cactus National Monument, Arizona,

and movement, and security performance standards. Describe those standards in the FEIS.

Alternatives Analysis

The DEIS evaluates slight modifications to the proposed action, it essentially evaluates only the proposed action and the no-action alternative. For example, Alternatives 1 and 2 for the Sierra Pacific Power Company (SPPC [aka NV Energy]) project are a very slight shift in the proposed path for the transmission line. Further, the SPPC Macari Fiber Optic Alternative is a fiber optic communication line and it is difficult to see how this alternative furthers the purpose and objective of the projects. The one alternative evaluated for the Ormat project is the relocation of two well sites (wells U and V) and the portion of the pipeline running from Well Site T to W to protect riparian and surface waters within canals. While we recognize the environmental benefits from these proposed design modifications, we recommend that the FEIS consider an environmentally preferable alternative that allows for a more meaningful comparison of a broader range of alternatives.

CEQ Regulations for implementing NEPA (40 CFR, Parts 1500 - 1508) state that the alternatives section of an EIS should "rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly describe the reasons for their having been eliminated" (40 CFR, part 1502.14). All reasonable alternatives that fulfill the purpose of the Project's purpose and need should be evaluated in detail, including alternatives outside the legal jurisdiction of the BLM (Council on Environmental Quality's (CEQ) Forty Questions[5], #2a and #2b). The more alternatives considered, the greater the possibility of avoiding significant impacts. "*In determining a reasonable range of alternatives, the focus is on what is "reasonable" rather than on whether the proponent or applicant likes or is itself capable of carrying out a particular alternative. Reasonable alternatives include those that are practical and feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.*" (CEQ Forty Questions, #2a).

The environmental impacts of the proposal and alternatives should be presented in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public (40 CFR 1502.14). The potential environmental impacts of each alternative should be quantified to the greatest extent possible (e.g., acres of wetlands impacted, tons per year of emissions produced, etc.).

Recommendations:
The alternatives analysis in the FEIS should include a discussion of locations, including on-site alternatives that demonstrate a reduction of the environmental impacts.

[5]Forty Most Asked Questions Concerning CEQ's NEPA Regulations, 40 CFR Parts 1500-1508, Federal Register, Vol. 46, No. 55, March 23, 1981.

In the FEIS the potential environmental impacts of each alternative should be quantified to the greatest extent possible (e.g., acres of wetlands impacted, tons per year of emissions produced, etc.). For example, the FEIS should include a matrix that rates each of the alternatives on each of the selection criteria. Quantitative values should be included wherever practicable.

The FEIS should identify and analyze an environmentally preferable alternative. Options such as reducing the footprint of the proposed Project within the Project area or relocating sections/components of the Project to other areas, including private land, to reduce environmental impacts should be examined.

Best Management Practices and Environmental Protection Measures/Management Plans

The DEIS contains an Appendix E, Environmental Protection Measures and Best Management Practices. Throughout the DEIS, under the heading Mitigation and Monitoring Measures, the mitigation or reduction of environmental impacts are dependent on the implementation of the Best Management Practices listed in Appendix E and/or the use of various management plans. According to the Final Programmatic EIS (PEIS) for Geothermal Leasing in the Western United States[6] Best Management Practices (BMPs) are state-of-the-art mitigation measures applied on a site-specific basis to avoid, minimize, reduce, rectify, or compensate for adverse environmental or social impacts. They are applied to management actions to aid in achieving desired outcomes for safe, environmentally responsible resource development, by preventing, minimizing, or mitigating adverse impacts and reducing conflicts. The purpose of this appendix (Appendix D of reference 6) is to provide a list of recommended BMPs that would be incorporated as appropriate into the permit application by the lessee or would be included in the approved use authorization by the BLM as conditions of approval.

We recognize that not all the BMPs from the PEIS would be needed for this Project, but at a minimum, the mitigation measures reasonably necessary to ensure environmentally responsible geothermal development should be selected from the list. Also the selection of appropriate BMPs and mitigation measures should be dependent on factors such as the Project size, location, site specific characteristics, and potential resource impacts and can be further modified to meet site-specific situations and agency requirements. Additionally a menu of typical BMPs can also be found on the BLM Washington Office Fluid Minerals web site at: www.blm.gov/bmp.

Various management plans are listed throughout the DEIS. The terminology for the plans was not entirely consistent throughout the DEIS. Additionally the requirements and suggested content for the plans was not defined.

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[6] *Final Programmatic Environmental Impact Statement for Geothermal Leasing in the Western United States.* Prepared by US DOI BLM, USDA Forest Service, and EMPSi. October 2008

Recommendations:
In the FEIS, include a review of the BMPs developed for the PEIS for Geothermal Leasing in the Western United States.

The FEIS should incorporate the applicable BMPs for mitigation of the impacts analyzed, tailored to the site specific conditions. Additionally, we recommend the FEIS BMPs appendix use the headings and organizational structure similar to the PEIS BMPs Appendix D.

The FEIS should include a table listing all management plans to be developed that are intended as mitigation measures along with the requirements for the contents of the plans. This list of plans and guidance could be included in the FEIS Appendix E, Environmental Protection Measures and Best Management Practices. Examples would be:

- Dust Control Plan (DCP) - The dust control plan would include:
  - BMPs defined by the Nevada State Conservation Commission in its Best Management Practices Handbook (1994),
  - best practical methods included in the Dust Control Handbook for Churchill County (2010), and
  - other measures that must be implemented as required by the Surface Area Disturbance permit and during construction to reduce fugitive dust emissions.

- Storm Water Pollution Prevention Plan (SWPPP) - The SWPP would be in accordance with:
  - the NPDES General Construction Stormwater Permit to minimize erosion from the Project construction worksites.

<u>Emergency Planning and Community Right to Know Act and CAA §112(r)</u>

EPA Region 9's Emergency Prevention and Preparedness Section is currently working with Enel Green Power North America, Inc. regarding their existing geothermal facility at Salt Wells. The Ormat and Vulcan projects will be located near the existing Enel facility. The geothermal power plants will have to comply with CAA §112(r), and, as applicable, EPCRA § 303, 311, & 312. Additionally, since the establishment of the Emergency Planning and Community Right-to-Know Act in 1986, the county's Local Emergency Planning Committee (LEPC) can require a facility to produce an emergency response plan whether or not it is required under other regulations. Nevada's LEPCs are currently set up at the county level.

Recommendation:
The FEIS should discuss compliance with CAA §112(r) and EPCRA §§ 303, 311, & 312.

Biological Resources, Habitat and Wildlife

During construction of the proposed Project, vegetation would be cleared and soils moved during the construction of roads, well pads, substation, switchyard, and other facilities.

All raptor and owl species are protected under the Migratory Bird Treaty Act (MBTA). The golden eagle and bald eagle also receive protection under the Bald and Golden Eagle Protection Act (BGEPA). The MBTA, however, has no provision for allowing unauthorized take. In September 2009, the FWS finalized permit regulations[7] under the BGEPA for the take of bald and golden eagles on a limited basis, provided that the take is compatible with preservation of the eagle and cannot be practicably avoided. The final rule states that if advanced conservation practices can be developed to significantly reduce take, the operator of a facility may qualify for a programmatic take permit. Most permits under the new regulations would authorize *disturbance,* rather than take.

On page 4-88 the DEIS states "To reduce the risk of bird collisions, construction would conform to those practices described in the document "Mitigating Bird Collisions with Power Lines: The state of the art in 1994" (APLIC 1994)". Later, on page 4-90, the DEIS also states "Electrocution would be avoided by following guidelines to reduce avian electrocution risk (APLIC 2006). In order to comply with the Bald and Golden Eagle Protection Act and BLM's Instruction Memorandum (IM) 2010-156, an avian protection plan would be developed utilizing these recommendations and in consultation with the USFWS to reduce the risk of "take" for golden eagles and to reduce the likelihood of population-level impacts. The avian protection plan measures would be incorporated into the ROD."

Recommendations:
The FEIS should include the Biological Opinion from the USFWS.

Mitigation and monitoring measures that result from consultation with USFWS to protect sensitive biological resources should be included in the FEIS and incorporated into the ROD.

Identify in the FEIS specific measures to reduce impacts to eagles and clarify how the proposed Project will comply with the MBTA and BGEPA.

If alternatives cannot be developed that avoid the take of eagles, develop an operational monitoring and adaptive management plan to address this issue.

Include in the FEIS a requirement for the Avian Protection Plan (APP) be developed using the 2005 Avian Power Line Interaction Committee (APLIC) and USFWS Avian Protection Plan Guidelines.

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[7] See Eagle Permits, 50 CFR parts 13 and 22, issued Sept. 11, 2009. See internet address: http://www.fws.gov/migratorybirds/CurrentBirdIssues/BaldEagle/Final%20Disturbance%20Rule%209%20Sept%202009.pdf

Invasive Species and Pesticide Management

Executive Order 13112, *Invasive Species* (February 3, 1999), mandates that federal agencies take actions to prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause. Executive Order 13112 also calls for the restoration of native plants and tree species. Since the proposed Project will entail new landscaping, the DEIS should describe how the Project will meet the requirements of Executive Order 13112.

The DEIS includes pesticides as part of its list of hazardous materials to be stored on site. It should be made clear in the DEIS whether or not pesticides may be used during the construction and operation of the Project.

Recommendation:
The FEIS should include an invasive plant management plan to monitor and control noxious weeds. The Geothermal PEIS provides a listing of the required elements in Appendix D.

If pesticides are to be used during construction and operation of the Project, the FEIS should discuss the use, type, and quantities of pesticides and require that an integrated pest management plan be developed to ensure that applications would be conducted within the framework of all Federal, State, and local laws and regulations and entail only the use of EPA-registered pesticides.

Geological Hazards

The same attributes that make the Salt Wells area a prime area for geothermal energy generation also may raise geological hazard risks. Various studies[8] in other areas have raised concerns about induced seismicity and/or subsidence as a result of water injection and production. In the case of geothermal induced seismicity withdrawal of fluids as well as injection of fluids can cause seismicity, though there is not a strict one to one correlation with injection. In most regions where there are economic geothermal resources there is usually tectonic activity, such as in the western United States. These areas are more prone to induced seismicity than in more stable areas of the United States[9]. Potential geological hazards, in particular, induced seismicity and subsidence should be more fully discussed in the FEIS

Recommendation:
The FEIS should more fully discuss the potential for geological hazards such as induced seismicity or subsidence especially in light of the number of projects nearby and the

[8] Oppenheimer, D. H. (1986), Extensional Tectonics at The Geysers Geothermal Area, California, *J. Geophys. Res.*, 91(B11), 11,463–11,476, doi:10.1029/JB091iB11p11463
[9] Majer, E.L. 2008. White Paper: Induced Seismicity and Enhanced Geothermal Systems. Center for Computational Seismology, Ernest Orlando Lawrence Berkeley National Laboratory.

evidence of geologic activity. The FEIS should discuss how geological hazards would be monitored and mitigation measures to be employed if detrimental geological hazards are manifested by the operation of the plants.

Cumulative Impacts

The cumulative impacts analysis should provide the context for understanding the magnitude of the impacts of the alternatives by analyzing the impacts of other past, present, and reasonably foreseeable projects or actions and then considering those cumulative impacts in their entirety (CEQ's Forty Questions, #18).

As an indirect result of providing additional power, it can be anticipated that this Project will allow for development and population growth to occur in those areas that receive the generated electricity.

Recommendations:
The FEIS should describe the reasonably foreseeable future land use and associated impacts that will result from the additional power supply. The document should provide an estimate of the amount of growth, its likely location, and the biological and environmental resources at risk.

The FEIS should consider the direct and indirect effects of the inter-connecting transmission line for the proposed Project, as well as the cumulative effects associated with the transmission needs of other reasonably foreseeable projects.

The FEIS should include the potential for other geothermal or energy related developments in the local regional area (Churchill County) besides the NAS Fallon projects. Possibly include the Magma Energy project, Terra Gen Power LLC project, Sierra Geothermal etc.

Climate Change

Scientific evidence supports the concern that continued increases in greenhouse gas emissions resulting from human activities will contribute to climate change. Global warming is caused by emissions of carbon dioxide and other heat-trapping gases. Global warming can affect weather patterns, sea level, ocean acidification, chemical reaction rates, and precipitation rates, resulting in climate change. Reports also indicate that deserts may store as much carbon as temperate forests.

Recommendations:
The FEIS should consider how climate change could potentially influence the proposed Project, specifically within sensitive areas, and assess how the projected impacts could be exacerbated by climate change.

The FEIS should quantify and disclose the anticipated climate change *benefits* of geothermal energy projects. We suggest quantifying greenhouse gas emissions from different types of generating facilities including solar, geothermal, natural gas, coal-burning, and nuclear and compiling and comparing these values.

Hazardous Materials/Hazardous Waste/Solid Waste & Health and Safety

The FEIS should address potential direct, indirect and cumulative impacts of hazardous waste from construction and operation of the proposed Project. On page 4-185 and 4-186 the DEIS states both the Vulcan and Ormat plants – "These materials would include, but would not be limited to, drilling additives and mud, diesel fuel, lubricants, solvents, oil, equipment/vehicle emissions, geothermal water, laboratory materials, and ammonia water (working fluid). However, the DEIS does not assess the impacts associated propane use at the Project. The document should identify projected hazardous waste types and volumes, and expected storage, disposal, and management plans. It should address the applicability of state and federal hazardous waste requirements. Appropriate mitigation should be evaluated, including measures to minimize the generation of hazardous waste (i.e., pollution prevention and hazardous waste minimization). Alternate industrial processes using less toxic materials should be evaluated as mitigation. This potentially reduces the volume or toxicity of hazardous materials requiring management and disposal as hazardous waste.

On page 4-5and page 4-48 the proposed working fluid for the Ormat binary plant is stated to be pentane. On page 4-20 it is stated for the Vulcan plant – "The Vulcan binary power plants would use a hydrocarbon working fluid that would be determined once the temperature of the geothermal resource is known. As previously mentioned, the DEIS discusses pentane, but, on page 4-177 states that the working fluid for the Vulcan binary plant is pentane. Later, on page 4-185 and 4-186 the following is stated for both the Vulcan and Ormat plants – "These materials would include, but would not be limited to, drilling additives and mud, diesel fuel, lubricants, solvents, oil, equipment/vehicle emissions, geothermal water, laboratory materials, and ammonia water (working fluid). The primary types of exposure to pentane are from inhalation, skin contact, and eye contact."

Recommendations:
The FEIS should more fully identify projected hazardous waste types and volumes, and expected storage, disposal, and management plans.

The FEIS should correct the inconsistent descriptions of the working fluid as described above, and describe the impacts of the working fluid.

Project Decommissioning

Geothermal Power Plants are designed for life spans of 20 to 30 years. With proper resource management the life can exceed design values. The life of the proposed Project should be taken into consideration regarding decommissioning and reclamation.

Recommendation:
EPA recommends that the FEIS identify bonding or financial assurance strategies for decommissioning and reclamation.

Air Quality

National Ambient Air Quality Standards (NAAQS) and Particulate Matter

The DEIS describes and estimates air emissions from the proposed facility, including potential construction and maintenance activities, as well as proposed mitigation measures to minimize those emissions. Though we understand that the area where the Project will be implemented is in attainment for NAAQS, EPA recommends an evaluation of the following measures to reduce emissions of criteria air pollutants and hazardous air pollutants (air toxics).

Recommendations:

- *Equipment Emissions Mitigation Plan (EEMP)* – The FEIS should identify the need for an EEMP. An EEMP will identify actions to reduce diesel particulate, carbon monoxide, hydrocarbons, and NOx associated with construction activities. We recommend that the EEMP require that all construction-related engines:
    - are tuned to the engine manufacturer's specification in accordance with an appropriate time frame;
    - do not idle for more than five minutes (unless, in the case of certain drilling engines, it is necessary for the operating scope);
    - are not tampered with in order to increase engine horsepower;
    - include particulate traps, oxidation catalysts and other suitable control devices on all construction equipment used at the Project site;
    - use diesel fuel having a sulfur content of 15 parts per million or less, or other suitable alternative diesel fuel, unless such fuel cannot be reasonably procured in the market area; and
    - include control devices to reduce air emissions. The determination of which equipment is suitable for control devices should be made by an independent Licensed Mechanical Engineer. Equipment suitable for control devices may include drilling equipment, generators, compressors, graders, bulldozers, and dump trucks.

- *Fugitive Dust Control Plan* - The FEIS should identify the need for *Fugitive Dust Control Plan.* We recommend that it include these general recommendations:
    - Stabilize open storage piles and by covering and/or applying water or chemical/organic dust palliative where appropriate. This applies to both inactive and active sites, during workdays, weekends, holidays, and windy conditions.
    - Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions; and

- When hauling material and operating non-earthmoving equipment, prevent spillage and limit speeds to 15 miles per hour (mph). Limit speed of earth-moving equipment to 10 mph.

Miscellaneous Edits

In document title or abstract page, the word Environmental is spelled as 'Environemtnal'.

On page 1-11 the DEIS states, "According to the PEIS[10] the state of Nevada is expected to commercially develop 1,473 MW and 2,880 MVW of electricity from geothermal resources by the years 2015 and 2025, respectively."

Recommendation:
The FEIS should replace the acronym MVW with MW (megawatts).

On page 2-8 the aluminum conductor is listed as - The 230-kV transmission line would use a 795 MCM aluminum conductor.

Recommendation:
The FEIS should include MCM, a wire size of thousands of circular mills, in the Acronyms and Abbreviations listing.

On page 2-20 Table 2-2 the DEIS states, "Access roads would extend from existing unpaved roads to project components as shown in Figure 2-7," but access roads are not shown on the map of figure 2-7.

Recommendation:
The FEIS should include the access roads to Figure 2-7 and an appropriate symbol should be included in the legend.

On page 3-20 the DEIS states, "Most of the survey area is underlain by basin fill deposits with and no identified metallic ore deposits (BLM and USFS 2010)."

Recommendation:
The FEIS should state - Most of the survey area is underlain by basin fill deposits with no identified metallic ore deposits (BLM and USFS 2010).

On page 4-21 the DEIS states, "Based on similar projects in other locations, the proposed project is expected to meet the Nevada ambient air quality standard for hydrogen."

Recommendation:

[10] *Final Programmatic Environmental Impact Statement for Geothermal Leasing in the Western United States.* Prepared by US DOI BLM, USDA Forest Service, and EMPSi. October 2008.

The FEIS should state - Based on similar projects in other locations, the proposed project is expected to meet the Nevada ambient air quality standard for hydrogen sulphide.

On page 4-25 the DEIS does not include the impacts from the Macari Fiber Optic Alternative under section 4.4 Minerals/Geology.

Recommendation:
The FEIS should state - discuss the impacts from the Macari Fiber Optic Alternative under section 4.4 Minerals/Geology.

On page 4-128 the DEIS states, "If emergency repairs are needed, SPPC would conduct repairs as rapidly as possible to ensure continuity of service and to protect public safety. As a result, it is typically infeasible to implement a stop work order, such as that required under Mitigation Measure 2, during emergency repairs." This is for the Vulcan project in section 4.16 Paleontological Resources.

Recommendation:
The FEIS should state - "If emergency repairs are needed, Vulcan would conduct repairs as rapidly as possible to ensure continuity of service and to protect public safety. As a result, it is typically infeasible to implement a stop work order, such as that required under Mitigation Measure 2, during emergency repairs."

In Appendix A page A-2 Table A-1 Geothermal Fluid Collection Pipeline – "Injection pipeline moves geothermal fluid from the power plant to the injection well, where it is returned to the geothermal reservoir."

Recommendation:
The FEIS should state- A pipeline that collects produced geothermal fluids and transports them to the plant.

In Appendix A page A-2 Table A-1 the term Substation is defined as - The substation converts power generated from the plant to the power system.

Recommendation:
The FEIS should clarify that the substation converts the electricity produced to the proper voltage and transfers this electricity to the transmission line.

In Appendix A page A-4 is a parenthetical phrase (hoe with no drill pipe).

Recommendation:
The FEIS should change the parenthetical statement to (hole with no drill pipe).

In Appendix A page A-5 under the heading Well Testing is the following paragraph, "The production of hot geothermal fluid from each lineshaft turbine pump will be flow-rate

controlled. Downhole pumps in the production wells will deliver the geothermal fluid to the plant via a pipeline gathering system at about 230 pounds per square inch, gauge."

Recommendation:
Suggest this paragraph does not belong under the heading well testing. The FEIS should place this paragraph in a more appropriate place in the document.

In Appendix A page A-11, A-17 and A-21 there are references cited.

Recommendation:
The FEIS should include references BLM 2007b, Nemzer et al, and USDOE 2007a in the main DEIS document list of references.

In Appendix A page A-14, the following is stated - Binary-cycle power plants can operate with lower water temperature 74°C to 182° C (165°F to 360°F) and produce few air emissions. See Chapter 1 for a more detailed discussion. A more detailed discussion of the binary cycle power plants could not be located in Chapter 1 of the DEIS.

Recommendation:
The FEIS should delete the reference to chapter 1.

In Appendix A page A-25, the following is stated, "As described in Chapter 2 of the EIS, SPPC proposes to use steel or wood H-frame tangent structures, steel or wood three-pole dead–end heavy-angle structures, steel single-pole heavy-angle dead-end structures, and steel single-pole staggered structures (Chapter 2, Figures 2-2 to 2-5)."

Recommendation:
The FEIS should refer to Chapter 2, Figures 2-3 to 2-6.

In Appendix E page E-3 the following is stated, "As part of the COM plan, SPPC or its contractor would prepare and implement a Dust Control Plan to minimize fugitive dust emissions generated from project construction activities." The COM plan is referenced many times later in Appendix E. COM plan is not defined in Appendix E nor is it included in the Acronyms and Abbreviations of the main document.

Recommendation:
The FEIS should include a definition of this COM plan, its purpose and a description of its contents be included in Appendix E.