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

FEB 25 2011

Kenneth Hogan
Federal Energy Regulatory Commission
Office of Energy Projects
888 First Street, N.E.
Washington, DC 20426

Subject: Draft Environmental Impact Statement for the Proposed Eagle Mountain Pumped Storage Hydroelectric Project, FERC Project No. 13123-002, Riverside County, California (CEQ #20100481)

Dear Mr. Hogan:

The U.S. Environmental Protection Agency (EPA) has reviewed the above referenced document. Our review and comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) Regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act (CAA).

EPA supports the development of renewable energy resources, as recommended in the Energy Policy Act of 2005, in an expeditious and well planned manner. Using renewable energy resources such as hydropower can help the nation meet its energy requirements while reducing greenhouse gas emissions. While renewable energy facilities offer many environmental benefits, appropriate sitting 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.

The Draft EIS (DEIS) evaluates three alternatives: (1) the Eagle Crest Energy Company's Proposal, (2) the Federal Energy Regulatory Commission Staff Alternative (Staff Alternative), and (3) the No Action Alternative. The DEIS does not identify the preferred alternative; therefore, our rating of this document is based on the Staff Alternative. We have rated the Staff Alternative as EO-2 -- Environmental Objections - Insufficient Information (see the enclosed "Summary of Rating Definitions"). The Staff Alternative appears to reduce some of the potential adverse environmental impacts of Eagle Crest Energy Company's Proposal. However, the Staff Alternative would contribute to overdraft of the Chuckwalla Valley aquifer and potential significant direct and cumulative effects on groundwater quality and sensitive wildlife species. These impacts should be avoided in order to fully protect the environment.

Our rating also reflects the insufficiency of information in the DEIS to fully disclose the project's need and potential impacts. There are significant unknown impacts due to the lack of access to the reservoir sites. Of major concern are the level of acid rock drainage production, amount of reservoir seepage, ability to adequately treat acid drainage and control seepage, and impacts to bats and other sensitive species that may use the proposed reservoir sites (existing mine pits) and reverse osmosis evaporation and brine ponds. Furthermore, the DEIS lacks an

Environmental Justice evaluation and a robust cumulative impact analysis for groundwater, air quality, and light pollution. Our detailed comments are enclosed.

EPA appreciates the opportunity to provide input on this intriguing project. We are available to further discuss all recommendations provided. When the FEIS is released for public review, please send one hard copy and two CDs to the address above (Mail Code: CED-2). If you have any questions, please contact me at (415) 972-3843 or contact Laura Fujii, the lead reviewer for this Project. Laura can be reached at (415) 972-3852 or fujii.laura@epa.gov.

Sincerely,

Enrique Manzanilla, Director
Communities and Ecosystems Division

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

cc: Jim Abbott, Bureau of Land Management, California State Office
Paul Murphey, State Water Resources Control Board
Andrea Compton, Chief of Resources, Joshua Tree National Park
Ray Brady, Energy Policy Team Lead, Bureau of Land Management
Jody Fraser, United States Fish and Wildlife Service
Becky Jones, California Department of Fish and Game
Mike Monasmith, California Energy Commission

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 analysed 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 analysed in the draft EIS, which should be analysed 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.

U.S. EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE EAGLE MOUNTAIN PUMPED STORAGE HYDROELECTRIC PROJECT, RIVERSIDE COUNTY, CALIFORNIA, FEBRUARY 25, 2011

Project Description

The Eagle Mountain Pumped Storage Hydroelectric Project would be sited in the inactive Kaiser Eagle Mountain Iron Mine and overlap with the proposed Eagle Mountain Landfill. The project is contiguous with Chuckwalla Valley, the site of numerous proposed utility-scale solar power projects. The pumped storage project proponent intends to use wind, solar, and general base-load energy during nighttime and weekend hours to pump water into an upper reservoir (existing central mining pit), and generate energy by releasing water to a lower reservoir (existing eastern mining pit) during peak energy demand periods. While the project would be a net energy consumer, it would act as a storage system for energy generated during the off-peak hours. According to the DEIS, the project could eliminate the need for 1,300 megawatts of fossil-fueled peaking facilities, potentially offsetting annual emissions of 1,443,260 tons of carbon dioxide.

Purpose, Need and Reasonable Range of Alternatives

EPA believes the discussion in the Draft Environmental Impact Statement (DEIS) regarding the purpose and need for the Project should be expanded. The *purpose* of the proposed action is typically the specific objectives of the activity, while the *need* for the proposed action may be to eliminate a broader underlying problem or take advantage of an opportunity. The Purpose and Need for a project should be broad enough to spur identification of the full breadth of a reasonable range of alternatives, regardless of what the future findings of an alternatives analysis may be.

As stated in the DEIS, the Eagle Mountain Pumped Storage Project (Project) would provide hydroelectric generation during daytime peak hours to meet Southern California's power requirements, resource diversity, and capacity needs. The project would generate 4,308 gigawatt-hours (GWh) annually, while consuming 5,744 GWh annually to pump water back up to upper reservoir. The Project is a net energy consumer. The North American Electric Reliability Corporation (NERC) forecasts that summer peak demands and annual energy requirements will grow at annual rates of 0.9 % and 1.2% through 2018. They project that capacity margins will *not* drop below target reserve levels during this period (p. 3). Numerous renewable energy generation projects (solar, wind, hydroelectric) are proposed for this region. One of these is the Lake Elsinore Pumped Storage Project (Federal Energy Regulatory Commission (FERC) Project Number 11858), located about 140 miles away, which would draw pumping power from the same energy sources and provide power to the same load and energy market as the proposed project. Many of the proposed renewable energy projects would also provide peak hour generation for the Southern California region.

> ***Recommendations:***
> The Final Environmental Impact Statement (FEIS) should reflect a purpose and need statement that is broad enough for analysis and consideration of a full range of reasonable alternatives for addressing the underlying need. We recommend serious consideration of a broader range of alternatives for addressing the needs for peaking capacity,

transmission regulation, and use of renewable energy generation (e.g., on-site distributed generation, improvements in efficiency, power conservation).

The FEIS should further explain how the Project meets those needs in the context of the many renewable energy project applications in the Desert Southwest and California. We recommend the FEIS include a summary of other energy projects being planned for the region to meet the same purpose and need.

While the Project proposes to utilize local renewable energy for pumping power, existing and proposed wind and solar generation may already be committed. The FEIS should provide evidence of a guaranteed source of renewable energy (e.g., contractually binding agreement) for pumping and that the project would be replacing non-renewable-fueled peaking generation.

The FEIS should include a table comparing the life-cycle costs of the different alternatives. Include information on the cost of the land, different project design criteria that would be required, acquisition effort, scheduling effects, and cost of mitigation.

The FEIS should demonstrate that the approved Project site is consistent with the Desert Renewable Energy Conservation Plan for the Mojave and Colorado Desert Regions. At a minimum, the FEIS should describe and commit to a process to ensure approved projects are consistent with the Desert Renewable Energy Conservation Plan.

Groundwater Resources

Water Quality

Because access to the project site has not been granted, there is a lack of substantive data to determine if and how much acid rock drainage would occur or the amount of reservoir seepage. Eagle Crest Energy Company (Eagle Crest) proposes to implement a Phase 1 Pre-Design Site Investigation Plan to address this issue prior to final project design and construction (p. 68). One hundred seventy million tons of iron ore reserves of economic recoverability remain at the mine site. The ore has primary minerals of magnetite and pyrite and secondary minerals of hematite and geothite. The quantity of pyrite and other sulfide minerals is not well defined. Interaction between project water and mine pit materials could result in substantial amounts of acid production, especially since project operations would result in a well-mixed, oxygenated, and fluctuating water column.

Recommendations:
We urge development of more definitive information on the amount of acid rock drainage, prior to FERC approval of the hydropower license. We recommend that the pre-design investigation of the acid leached byproducts (e.g. , metals and sulfate) and non-acid byproducts (e.g. arsenic) that could be produced as a result of the project be conducted prior to completion of the FEIS, and that the results be provided in the FEIS. The FEIS should also include a determination of the long term effects on applicable water quality standards after the project is closed down.

Eagle Crest proposes to implement a reverse osmosis system that could be retrofitted to accommodate buffering agents to treat water returning to the lower reservoir. This system would also be used to filter metals, precipitates, and microbes from acid drainage (p. 70).

> ***Recommendations:***
> The FEIS should include a full description of the cost, energy consumption, and feasibility of the reverse osmosis system to buffer the potential maximum amount of acid drainage. For instance, provide a short description of the buffering technology and information demonstrating that it is a proven technology for treating acid drainage.

Studies cited in the DEIS indicate fractures in bedrock could result in seepage that could raise groundwater levels under the lower reservoir and Metropolitan Water District's Colorado River Aqueduct. Seepage could also result in groundwater exit on the hillside south of the upper reservoir above the proposed Eagle Mountain landfill. Seepage could encounter the lining of the landfill in the long-term. The DEIS estimates that there will be about 1,600 acre-feet per year (af/yr) of potential seepage.

Final design of the upper reservoir will carefully identify the location and extent of faults, cracks, fractures, and discontinuities that could lead to seepage. Seepage mitigation includes: Curtain grouting beneath the footprints of the two upper reservoir dams, installation of monitoring wells and piezometers, installation of seepage recovery wells up-gradient and down-gradient of landfill prism to maintain groundwater levels below landfill liner, and other measures such as use of impervious blanketing on reservoir bottom and sides where needed. [1]

> ***Recommendation:***
> The FEIS should include more definitive information on the amount and flow direction of reservoir seepage.

Groundwater Withdrawal

We are concerned with the potential groundwater drawdown and cumulative impacts to the Chuckwalla Valley Groundwater Basin (Chuckwalla Basin) and the Pinto Basin, associated with the construction of the proposed Project, in conjunction with the reasonably foreseeable projects in the vicinity. Initial pumping to fill the reservoirs would exceed groundwater recharge by about 4,600 af/yr for 4 years. Pumping would then taper to 1,700 af/yr to replace water lost by evaporation (make-up water) (p. 72). Total groundwater use by the Project over the 50-yr license period is about 96,000 af.

The Chuckwalla groundwater basin is hydrologically linked with 4 other groundwater basins. Chuckwalla basin receives surface and subsurface inflow from Orocopia and Pinto basins, and drains east into the Palo Verde Mesa and Palo Verde basins (p. 53). The majority of groundwater in the Chuckwalla Basin is "ancient" water. Natural recharge of the Chuckwalla groundwater basin is relatively low, estimated as 12,700 af/yr (p. 59).

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[1] See p. 74 DEIS and "Eagle Mountain Pumped Storage Project -- Landfill Compatibility Report," by Richard Westmore, P.E., GEI Consultants, Inc., April 8, 2009, revised November 24, 2009.

The DEIS states that 62 wells would be drawn down by more than 5 feet during the initial reservoir fill period and 45 wells drawn down by more than 5 feet after 50 yrs of project operation (p. 77). A drop in groundwater levels could impact neighboring wells, lower the water table, and adversely affect groundwater-dependent vegetation and woodlands. Even modest drawdowns of 0.3 foot can adversely affect vegetation if groundwater drops below the effective rooting levels for a sustained period of time. Given the hydrological connection to the Pinto Basin Aquifer, which underlies portions of Joshua Tree National Park, there is concern that Park resources or associated springs could also be adversely affected.

> ***Recommendations:***
> The FEIS should: 1) describe the effectiveness of, and commitments to, the mitigation and monitoring plans proposed in the DEIS, and 2) address what mitigation measures would be taken, and by whom, should groundwater resources in the basins become overextended to the point that further curtailment is necessary due to, for example, additional growth, the influx of large-scale solar projects, drought, climate change, and the utilization of existing or pending water rights in the basin.
>
> The FEIS should include a groundwater basin balance analysis for cumulative effects to the Pinto Basin, as well as the Chuckwalla Valley Groundwater Basin. Include a more robust groundwater cumulative impacts analysis that considers impacts from the proposed Eagle Mountain Landfill, renewable energy projects, climate change, drought, and growth. The significance and potential implications of the project's cumulative impacts and level of groundwater depletion should be described.

Mitigation

Eagle Crest proposes groundwater and reservoir monitoring after implementation to confirm effectiveness of the seepage recovery system, assess the occurrence of reservoir-triggered seismicity, evaluate hydrocompaction and subsidence effects of reservoir seepage, and to monitor the integrity of reservoir and reverse osmosis evaporation and brine pond liners (Section 3.3.2 Water Resources). The DEIS does not describe what actions would be taken in the event monitoring data indicate contamination of the Chuckwalla Basin, or if there is a catastrophic event, such as reservoir dam or pond berm failure, or pumpage-, flood-, or landslide-induced reservoir overflow.

> ***Recommendation:***
> The FEIS should include an emergency response plan and describe what mitigation measures would be taken, and by whom, should monitoring reveal groundwater contamination or if a catastrophic event occurs.

Environmental Justice

Executive Order 12898 addresses environmental justice in minority and low income populations, and the Council for Environmental Quality (CEQ) has developed guidance concerning how to address Environmental Justice in the environmental review process (http://ceq.eh.doe.gov/nepa/regs/ej/justice.pdf).

The DEIS does not appear to address the potential cumulative disproportionate impact of the project on the small rural communities of Desert Center and Lake Tamarisk. These communities are very small and have been adversely affected by the boom and bust local economy. The DEIS includes a short chapter on Socioeconomics, which includes evaluation of worker needs and associated housing and services within the context of Riverside County; however, the effects on Desert Center and Lake Tamarisk are not culled out nor described within the context of small rural communities. It is not feasible to determine if there is an environmental justice impact, since there is no specific description of Desert Center or Lake Tamarisk demographics or income.

Recommendations:

Define the potential environmental justice concerns. Include a discussion of any environmental justice issues raised during scoping meetings. Briefly discuss the key issues that may raise environmental justice concerns, such as contamination or drawdown of domestic wells, air quality, noise, vibration, access to property, local business (e.g., tourism), and personal safety.

Define the reference community, as well as the affected community, and analyze whether there are disproportionately high and adverse human health or environmental impacts by comparing the impacts to the affected population with the impacts to the reference community. The reference community (or comparison group) is generally defined as the population that will benefit from the proposed project. The Environmental Justice section of the FEIS should briefly summarize the affected community and reference community, and provide the source of the demographic information.

Determine whether there are disproportionately high and adverse impacts, as detailed in the CEQ's "Environmental Justice: Guidance Under the National Environmental Policy Act" by considering the following three factors to the extent practicable for each of the identified potential environmental justice concerns:

a. Whether the health effects, which may be measured in risks and rates, are significant (as employed by NEPA), or above generally accepted norms.
b. Whether the risk or rate of environmental hazard exposure for a minority population or low-income population is significant (as employed by NEPA) and appreciably exceeds, or is likely to appreciably exceed, the risk or rate of hazard exposure for the general population or other appropriate comparison group; and
c. Whether health effects occur in a minority population or low-income population affected by cumulative or multiple adverse exposures from environmental hazards.

Propose appropriate mitigation if disproportionately high and adverse human health or environmental impacts on minority populations or low-income populations are likely to result from the proposed action and any alternatives.

Biological Resources

Project reservoirs would have estimated evaporation losses of 1,760 af/yr. To ensure that the concentration of total dissolved solids within the reservoir water remains at the same level as the source water, Eagle Crest would include a reverse osmosis desalination facility. Concentrated brine of about 270 af/yr would be treated in 6 evaporation ponds and 5 solidifying ponds (56 acres) constructed with clay or membrane liners and 8-foot-high berms. Salts would be removed from the ponds every 10 years (p. 65). These ponds would be managed to minimize attractiveness and access to migratory birds. Bird use and the effectiveness of bird deterrents would be monitored. Based on monitoring results, an adaptive management program would be implemented (p. 21). EPA's concerns include: 1) possible selenium, heavy metal, and salt exposure to wildlife, and 2) effects from unregulated discharges if the lagoons are breached.

> ***Recommendations:***
> The FEIS should describe the potential quality of the brine solution and potential risk of wildlife exposure to selenium, heavy metals, and salts. Describe what mitigation measures would be taken, and by whom, should management practices prove insufficient in avoiding wildlife exposure. We recommend development of an emergency response plan to address a potential breach in the pond berms or liners. Describe the process and identify the responsible party for responding to detection of contaminated groundwater.

Nelson's Bighorn Sheep spend much of the year in the mountainous areas surrounding the central project area. Project construction and facilities could disrupt migratory paths between available water sources and to breeding and lambing grounds. The DEIS states that it is unclear how disturbance would affect the current population, without more detailed information about the migratory pathways the bighorn sheep currently use to move from Eagle Tank to Buzzard Spring or to breeding and lambing areas (p. 110).

> ***Recommendation:***
> We recommend Eagle Crest consider funding a Nelson's Bighorn Sheep movement and migration study, in consultation with the National Park Service, to evaluate movement of the sheep through the Project site.

Cumulative Air Quality Analysis

The DEIS states that nitrogen oxide emissions (NOx) would be temporarily and cumulatively significant (over CEQA thresholds) during construction years 2013 & 2014. NOx is a precursor to the formation of ozone, which is the main component of urban smog. Ozone irritates the lungs, damages the respiratory system, and contributes to regional haze. Mitigation would include a two-year air monitoring study in partnership with the National Park Service to provide data to adjust the construction workload if exceedances of thresholds are observed.

Given the number of solar and transmission line projects proposed for the Chuckwalla Valley and the presence of the Joshua Tree National Park -- a designated Class I area protected under the federal Prevention of Significant Deterioration -- EPA believes that the FEIS should include a rigorous cumulative air quality impact analysis. Eagle Crest concluded that construction of the

solar projects could be excluded from the actions considered in the cumulative impacts analysis due to their locations and distances from the proposed project, while construction of the Eagle Mountain Landfill project would probably not be constructed at the same time (p. 208).

Recommendations:
Discuss, in the FEIS, the cumulative emissions from the proposed Project combined with proposed solar and transmission line projects that would affect the same air basin. In consultation with the local air quality management agency, we recommend these cumulative emissions data be used to develop an incremental construction schedule that would not result in any violations of local, State or Federal air quality regulations. EPA strongly recommends incremental construction on-site to ensure air quality impacts are limited and are sufficiently staggered.

The FEIS should provide technical justification for the determination, regarding any project, that it is too far from the proposed Project to contribute to cumulative air quality impacts.

If mitigation measures beyond construction rescheduling and standard Best Management Practices would be needed, or if the Project would affect the ability of other foreseeable projects to be permitted, the FEIS should discuss this.

Climate Change

The DEIS does not appear to evaluate greenhouse gas emissions nor the effects of climate change on project viability, management, and operation. Considering that the Project is planned to be in operation for 50 years, the FEIS should include a description of how climate change may affect the Project, particularly groundwater resources.

Recommendations:
The FEIS should include a section evaluating Project greenhouse gases (GHG) emissions, including detailed estimates of emissions from construction and operation of the Project. In addition, provide information detailing the impacts that climate change may have on the Project, its sources of groundwater, and reclamation and restoration efforts after construction and decommissioning. The FEIS should also discuss how climate change may exacerbate or otherwise alter the impacts of the Project, particularly with regard to sensitive species and groundwater consumption.