

Memorandum

To: Bill Pfanner, Project Manager
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, California 95814

Date: June 19, 2008

From: W. E. Loudermilk, Regional Manager *WEL*
Department of Fish and Game – Central Region

Subject: Beacon Solar Energy Project
Application for Certification

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The California Department of Fish and Game (Department) has reviewed the Beacon Solar Energy Project Application for Certification (AFC) submitted to the California Energy Commission (Commission) on behalf of Beacon Solar, LLC (Applicant). The Department reviewed the AFC contents to assist in the Commission's Preliminary Assessment for the Project and to determine whether the application contains sufficient information to proceed with impact analysis. This memorandum further intends to identify the requirements of applicable State laws and regulations that the Department administers. It is our understanding that the Warren-Alquist Act (Public Resources Code Section 25000 et seq.) may exempt the Project from State permits which would normally be required; however, if this exemption does in fact apply, the Commission will include enforceable conditions of approval such that the Project will conform to the requirements of applicable State laws. It is important to note that the Department is currently evaluating the applicability of the Warren-Alquist Act and the Department's regulatory authority under the California Endangered Species Act (CESA); a decision and guidance is forthcoming. Similarly, it is our understanding that the Preliminary Assessment process is a California Environmental Quality Act (CEQA) equivalent. As such, this letter approaches the Project from the Department's CEQA Trustee and Responsible Agency perspective, while recognizing that a parallel process may actually occur.

The Project is located in the Mojave Desert in eastern Kern County along State Route 14, approximately 4 miles north of California City. Project implementation would result in the construction of an estimated 2,012-acre solar plant site and supporting linear components. The plant site would include a solar array and power block area with steam turbine generators and on-site support facilities, including administrative buildings and three evaporation ponds (approximately 8.3 acres each) to handle wastewater from the Project's cooling water system. A 17.6 mile long eight-inch natural gas line would be constructed and would connect to an existing Southern California Gas pipeline in the California City area via Neuralia Road and California City Boulevard. The transmission line would connect to the Barren Ridge Substation located southwest of the solar plant site and across State Route 14. Two options have been proposed for the electric transmission lines; Option 1 would result in construction of a new approximately 3.5-mile 230-kV transmission line, and Option 2 would result in construction of a new approximately 2.3-mile 230-kV transmission line.

The Project proposes to divert at least two ephemeral desert washes to the outside perimeter of the solar plant site; the largest diversion would involve 8,150 feet of Pine Tree Creek which currently bisects the proposed solar plant site. The proposed Pine Tree Creek diversion would move the creek to the southern and eastern perimeter of the solar plant site, which would require a few 90 degree turns in the newly constructed channel. The new channel would be 14,000 feet long, would vary from between 600 and 1,000 feet in width, and would be sized to convey storm water discharge for a 100-year event, conservatively estimated to be between 14,000 and 20,000 cubic feet per second (cfs). The new channel would be a 3:1 trapezoidal channel, have an average channel depth of approximately eight feet, and a minimum bottom width of 345 feet and a maximum bottom width of about 2,900 feet at the end of the transition which would result in sheet flow at the northeast of the Project site. The Project description states that dirt berms constructed on the sides of the channel will be used to accomplish the transition from the new channel bottom back to the existing ground surface/flow patterns at the northeast corner of the solar plant site. An existing railroad drainage crossing is located west of the plant site, and the flow from this crossing will be rerouted into a swale to convey the flow from this drainage to the rerouted portion of Pine Tree Creek. This swale will be approximately 9,000 feet long with an average depth of one foot and a minimum bottom width of 15 feet.

Although not discussed as part of the Project Description in the AFC (Section 2.0), the Drainage Plan in Appendix L discusses that a detention basin will be constructed to restrict flows exiting the stream diversion at the northeast corner of the solar plant site. This detention basin will serve as a single point of discharge and will gravity drain back into Pine Tree Creek. The Drainage Plan indicates that the detention basin will be designed to handle a 10-year, 5-day flow event, and will be designed to completely drain within seven days. Section 2.0 of the AFC should include a map and detailed discussion of the design layout for the detention basin.

CEQA and Department of Fish and Game Code: The Department is a Trustee Agency with the responsibility under CEQA for commenting on projects that could impact plant and wildlife resources. Pursuant to Fish and Game Code Section 1802, the Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. As a Trustee Agency for fish and wildlife resources, the Department is responsible for providing, as available, biological expertise to review and comment on environmental documents and impacts arising from project activities, as those terms are used under CEQA.

The Department is a Responsible Agency when a subsequent permit or other type of discretionary approval is required from the Department, such as an Incidental Take Permit, pursuant to CESA, or a Streambed Alteration Agreement issued under Fish and Game Code Section 1600 et seq. Both actions by the Department would be considered "projects" (CEQA Guidelines Section 15378) and would be subject to CEQA.

Pursuant to Fish and Game Code Section 1600 et seq., the Department has regulatory authority with regard to activities occurring in streams and/or lakes that could adversely affect any fish or wildlife resource. Rerouting streams and placing temporary and permanent stream crossings in streams would normally be conducted under a 1600 Agreement, and the project proponent would be required to submit a Stream Alteration Notification to the Department for this Project.

The biological studies conducted for this Project found that this Project would likely result in "take" of the State and Federally threatened desert tortoise (*Gopherus agassizii*) and may affect other listed species, including the State threatened Mohave ground squirrel (*Spermophilus mohavensis*). Pursuant to Fish and Game Code Section 2081 (CESA), an Incidental Take Permit is required for any otherwise lawful activities which could result in "take" (as defined by Section 86 of the Fish and Game Code) of any species listed under CESA. The Department typically relies on the Lead Agency's CEQA document or CEQA equivalent process on which to make our own CEQA findings.

For the Lead Agency's CEQA document to suffice for permit/agreement issuance, it must fully describe the potential Project-related impacts to stream/riparian resources and listed species, as well as commit to measures to avoid, minimize, and mitigate impacts to these resources. Impacts to State-listed species must be "fully mitigated" in order to comply with CESA, which is a much more stringent standard than the "mitigate to less than significant level" criteria of CEQA. If a CEQA document does not contain the minimum necessary information, the Department may need to act as a Lead CEQA Agency and complete a subsequent CEQA document. This could significantly delay permit issuance and, subsequently, Project implementation. In addition, CEQA grants Responsible Agencies authority to require changes in a project to lessen or avoid effects of that part of the project which the agency will be called on to approve, such as the proposed rerouting of Pinetree Creek (CEQA Guidelines Section 15041).

California Endangered Species Act Compliance: The Project Applicant submitted an Incidental Take Permit Application for "take" of the State Threatened desert tortoise and Mohave ground squirrel, which the Department deemed incomplete. The Department determined that the Applicant will need to 1) provide a complete Project description, 2) provide an analysis of the impact of the proposed taking, as some biological surveys were not yet completed when the Incidental Take Permit Application was submitted; 3) provide an analysis of whether issuance of an Incidental Take Permit would jeopardize the continued existence of State-listed species for which "take" coverage is being sought; 4) propose measures that minimize and fully mitigate the impacts of the proposed taking; 5) provide a proposed plan to monitor compliance with the minimization and mitigation measures; and 6) provide a description of the funding source and level of funding available for implementation of the minimization and mitigation measures.

The following paragraphs discuss additional items and several other essential details which are lacking in the AFC.

Avian Impacts: Fish and Game Code protects birds, their eggs, and nests including: Sections 3503 (regarding unlawful "take," possession or needless destruction of the nest or eggs of any bird), 3503.5 (regarding the "take," possession or destruction of any birds-of-prey or their nests or eggs), and 3513 (regarding unlawful "take" of any migratory nongame bird). These Fish and Game Code Sections do not allow for "take" nor is there a mechanism (permitting process) to allow for "take" unless a species is also listed under CESA or take is allowed by other portions of the Fish and Game Code. As a result, the Project and associated conditions of approval must include measures that prevent "take" of birds.

Three evaporation ponds, totaling 25 acres, are proposed for the Project. These ponds will be located adjacent to one another and will be used to collect cooling water and contain any residue of chemical spills. Naturally occurring open water sources are rare and usually ephemeral in the Mojave Desert. The presence of evaporation ponds will likely attract birds that would normally migrate through the area. The Department is concerned that these ponds will become hypersaline over time as chemical residues and salts accumulate, creating a situation where salt-tolerant invertebrates, including brine shrimp, become established. Avian migrants that use these ponds as a food source or as a stopover during migration can suffer mortality or morbidity due to salt encrustation on feathers and ingestion of toxic levels of salts and other chemicals. The Department recommends that the AFC include an analysis on whether these evaporation ponds can be designed within an enclosure. If this is not a feasible alternative, then the AFC should include a detailed avian and invertebrate monitoring plan and provide adequate avoidance, minimization, and mitigation measures to offset potential avian impacts. The Department also recommends that the AFC include an analysis of avian migration patterns covering a suitable amount of territory around the Project and include an analysis for night-migrating species. The Department recommends that the Applicant submit a proposal for an avian migration study to the Department, Commission, and United States Fish and Wildlife Service (USFWS) for review and approval prior to its inclusion in the AFC.

Other potential impacts to birds from solar power projects include collisions with reflective mirrors. Avian mortality studies should include surveys of the solar arrays located within the solar plant site. The impact analysis should also determine whether the concentrated light and heat poses a risk to birds that would fly near the solar mirrors and heat transfer lines. If monitoring data are not available from similar facilities, then we recommend a predictive analysis that quantifies the light and heat levels that birds would encounter. If it appears that this could result in an adverse impact, then we recommend developing an adaptive management program, designed to avoid impacts to birds, to be approved by the Department.

Burrowing Owl: A total of 27 active burrowing owl (*Athene cunicularia*) burrows with sign were identified within the Project site, plus a one-mile buffer. This included 14 burrows detected within the Project site boundary and 13 within the one-mile buffer. Three burrowing owls were observed within the Project area, and four additional owls were observed within the one-mile buffer. The survey area and buffer did not include the proposed alignment for the natural gas pipeline. The AFC should include data from biological surveys along the natural gas pipeline and information on how the displacement of burrowing owls and substantial loss of foraging habitat will affect the local population of burrowing owls. If any ground-disturbing activities will occur during the burrowing owl nesting season (approximately February 1 through August 31), implementation of avoidance measures is required. The Department's Staff Report on Burrowing Owl Mitigation (CDFG, 1995) recommends that impacts to occupied burrows be avoided by implementation of a no-construction buffer zone of a minimum distance of 250 feet, unless a qualified biologist approved by the Department verifies through non-invasive methods that either: 1) the birds have not begun egg laying and incubation; or 2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival. Failure to implement this buffer zone could cause adult burrowing owls to abandon the nest, cause eggs or young to be directly impacted (crushed), and/or result in reproductive failure. Impacts of this nature are violations of Fish and Game Code Sections 3503, 3503.5, 3513, and the Federal

Migratory Bird Treaty Act (MBTA). The Department recommends that a minimum of 6.4 acres of foraging habitat per pair or unpaired resident burrowing owl should be acquired and permanently protected to offset the loss of foraging and burrow habitat.

Hazardous Materials: Fish and Game Code Section 5650 prohibits the discharge of specific materials and substances into "Waters of the State," including those which are deleterious to fish and wildlife resources. The AFC discusses the use of water trucks to rinse off the mirrors with deionized water on a regular basis. The AFC should specify if any chemicals are used in addition to the deionized water to clean the mirrors, whether these materials are hazardous to the environment, and how the Applicant will prevent their entrance into nearby watercourses.

The AFC provides no information about how vegetation and burrowing animals would be controlled on-site. The impact analysis should disclose the anticipated use of herbicides and pesticides, compare the use to current levels on-site, assess the potential for these to affect native species (including all species discussed in this letter and the application), and assess the potential for such materials to migrate off-site via runoff, wind, and animal dispersal.

Raven Management: Predation on juvenile desert tortoises by common ravens (*Corvus corvax*) has been a significant cause for concern by the Department and USFWS since increased raven numbers may be both contributing to tortoise population declines and preventing recovery. Water is a critical resource for common ravens in the desert and breeding ravens are known to leave their territories to drink water several miles away. The presence of unnatural sources of water, including evaporation ponds and detention basins, may attract ravens and allow ravens to persist in areas that are isolated from natural sources of water. In addition, the Project may result in construction of structures that inadvertently facilitate raven nesting, which would increase predation on tortoises by breeding ravens. The AFC should include a raven management and monitoring plan approved by the Department, Commission, and USFWS. This plan should include a baseline study of raven use of the Project site and cover a suitable amount of territory around the Project site.

Stream Alteration: Pursuant to Fish and Game Code Section 1600 et seq., the Department has regulatory authority with regard to activities occurring in streams and/or lakes that could adversely affect any fish or wildlife resource. To minimize additional requirements by the Department under CEQA, the document should fully identify the potential impacts to the lake, stream, or riparian resources and provide adequate avoidance, mitigation, monitoring, and reporting commitments for issuance of the Streambed Alteration Agreement (SAA). Early consultation is recommended, since modification of the proposed Project may be required to avoid or reduce impacts to fish and wildlife resources.

Pine Tree Creek is an ephemeral stream that bisects the Project site and flows from Pine Tree Canyon southwest of the Project site to its terminus in Koehn Dry Lake which is located northeast of the Project site. According to the AFC, the Pine Tree Creek is a major drainage for approximately 82 square miles of watershed during rain events, and the 100-year flow event is conservatively estimated at between 14,000 and 20,000 cfs. The Applicant proposes to reroute this stream around the perimeter of the solar plant site. The Department opposes the elimination of watercourses (including ephemeral desert washes) and/or the channelization of

natural and manmade drainages or conversion to subsurface drains and recommends substantial setbacks which preserve the wildlife habitat values and maintains its value to on-site and off-site wildlife populations. If left in place, the stream could function to provide cover, forage, and connectivity for wildlife between the northern and southern Project boundaries. Therefore, the Department recommends against the rerouting of Pine Tree Creek. Instead, the Department recommends, as a preferred alternative, that the Commission require a substantial no-construction buffer from the outer edge of each side of the Pine Tree Creek.

The AFC does not characterize the habitat that will be removed to accommodate the rerouted stream. The proposed rerouted channel will vary from 100 to 300 feet in width, 3 to 5 feet in height, and will be lined with riprap in order to handle 100-year, 20,000 cfs flows. The Department is concerned that changes in the natural flow patterns of Pine Tree Creek will result in problems with increased erosion, directly affecting resources located downstream, including sensitive plant and wildlife species (especially desert tortoise). The Department is also concerned that desert tortoise could become trapped within the trapezoidal riprapped channel without adequate cover or the ability to move out of the wash. The AFC should provide information on potential tortoise impacts, including potential impacts downstream from the channel diversion. The AFC should also provide information on channel design, which allows for tortoise passage, and provide specifics on a revegetation plan, which provides cover and forage for tortoise and other special status species. The AFC should provide enough detail to demonstrate to the Department that adequate erosion control measures are employed, especially at those locations where the channel is expected to change course around the Project perimeter and at locations downstream from the Project. The Department is also concerned about potential flooding impacts to a small existing community located downstream of the Project site; stream rerouting could change the character and timing of flood waters in this area. Since the Department may be issuing a SAA for this project, this issue would also need to be resolved prior to SAA issuance.

The Project's proposed power block area is centrally located within the solar plant site. According to the AFC, the power block will drain via sheet flow into ditches and into the relocated Pine Tree Creek. The AFC should provide adequate detail on how the solar plant site is designed to ensure that no materials considered deleterious to fish and wildlife resources will enter any water body or drainage.

Desert Kit Fox: During a recent site visit, Department and Commission staff observed two potential desert kit fox (*Vulpes macrotis arsipus*) burrows adjacent to the Pinetree Creek wash. The California Code of Regulations (CCR) Chapter 5 Section 460 states that "Fisher, marten, river otter, **desert kit fox** and red fox may not be taken at any time." (Emphasis added). Unless the Project proponent can demonstrate that the Project site has been adequately surveyed for desert kit fox, we recommend that the Project site is resurveyed using line transect survey methodology. The status of all potential dens (occupied/unoccupied/natal) should be determined and mapped. We recommend that the Applicant work with the Department to develop appropriate avoidance measures similar to those listed in the USFWS Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance.

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Revegetation Plan: The AFC mentions that the Applicant will revegetate the rerouted wash and all areas of temporary disturbance. The AFC should include specific details of a revegetation plan. The AFC should also include information about whether the cleaning of the mirrors with deionized water will promote the growth of both native and invasive plant species, and whether vegetation removal will be performed on a regular basis within the solar plant site.

Thank you for the opportunity to comment on the Application for Certification. Depending upon the results of the described biological surveys, actual Project configuration, and other details which will be disclosed in the Preliminary Analysis, we may have additional comments and recommendations during the public comment period regarding avoidance, minimization, and mitigation of Project impacts to habitat and special status species. If you have any questions regarding these comments, please contact Annette Tenneboe, Environmental Scientist, at 1234 East Shaw Avenue, Fresno, California 93710 or by telephone at (559) 243-4014, extension 220.

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