United States Department of the Interior

FISH AND WILDLIFE SERVICE
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IN REPLY REFER TO:
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February 11, 2013

Mike Monasmith
Senior Project Manager
Systems Assessment and Facility Siting Division
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, California 95814

Subject: Review of Applicant's Opening Testimony, Hidden Hills Solar Electric Generating System (11-AFC-2)

Dear Mr. Monasmith:

The U.S. Fish and Wildlife Service (Service) has reviewed the opening testimony provided by CH2MHill in support of BrightSource Energy's (BrightSource) proposal to develop and operate the Hidden Hills Solar Electric Generating System in Inyo County, California. We attempted to focus our review on issues that we have discussed previously with staff of the California Energy Commission (Commission), BrightSource, and other resource agencies; our review was limited to some degree by competing workload priorities.

The primary mandate of the Service is the conservation of fish and wildlife resources and their habitats. We provide these comments under the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), the Bald and Golden Eagle Protection Act (16 U.S.C. 668), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and other authorities of the Department of the Interior.

Page 4, Section C. Special Status Plant Mitigation. The testimony notes that special status plant species are likely more common than was demonstrated during surveys because the amount of rain during the survey period was low. BrightSource is proposing to conduct additional regional surveys, presumably when rainfall levels are appropriate for surveys, to "demonstrate that project impacts are less than significant;" it also requested "mitigation flexibility for potential plant impacts, including in-lieu fee payments." We concur that survey results are highly dependent on adequate rainfall and that additional surveys, when rainfall levels are appropriate, are likely to better define the impacts and potential mitigation. Consequently, we recommend that the Commission and BrightSource work with the appropriate agencies to develop a framework for such surveys and for mitigating impacts of the loss of sensitive plants, if the future surveys demonstrate that such mitigation would be appropriate.

Page 16, Special-status Wildlife Species. The testimony states that "Project development will result in the temporary loss of approximately 3,199 acres of habitat for a variety of common and special-status wildlife species." If BrightSource follows the procedures used at its Ivanpah facility, it will permanently remove habitat from portions of the site that support facilities such as administration buildings and the power towers. Within the heliostat field, it would reduce the height of vegetation to allow for installation of the heliostats. Plants would be allowed to grow to a height where they would not impair the function of the heliostats; at the point where the plants interfered with the heliostats, they would be trimmed. We acknowledge that, at least in the portions of the Hidden Hills site visited by our staff, the height of plants was generally lower than that at the Ivanpah site. Consequently, the amount of trimming of vegetation may differ between the sites.

We are unaware of studies that compare wildlife use of a site in the Mojave Desert before and after the construction of a heliostat field. Changes in the nature of the plant community that may result from trimming, shading, or other effects may alter use of the area by wildlife. The fence that would surround the site would certainly alter the use of the site by larger species that cannot pass through the fence. For these reasons, stating that the loss of habitat associated with construction is 'temporary' is premature. BrightSource is currently conducting various surveys to document the existing conditions on the site; repeating these studies while the solar plant is in operation would allow BrightSource and the reviewing agencies to assess more completely the effects of the heliostat field. Consequently, we recommend that the conditions of certification contain provisions to compare use of the site by wildlife before and after construction and to adjust compensation requirements accordingly.

BrightSource is currently conducting point count surveys for birds at the Hidden Hills site. We recommend that these studies continue until the onset of construction (in the event that the solar plant is permitted) so that the bird use of the site can be documented over as wide a range of environmental conditions as possible. Also, the paper included in BrightSource's testimony about bird use at its Solar Energy Development Center facility in Dimona, Israel, indicates that it conducted surveys to assess the number of migrating birds and the directions and elevations at which the birds were flying. If these data are not being collected during the point counts currently being conducted at the Hidden Hills site, we encourage BrightSource to undertake this work during migration to enable us to assess whether birds would traverse the flux fields.

Page 17, Section C. Potential Operational Related Impacts; Avoidance and Minimization Measures. Special-status Wildlife Species. The testimony states that "Onsite transmission lines and poles will be designed and constructed with appropriate spacing between conductors and/or bonding wires to avoid electrocution of large birds, as described in Avian Power Line Interaction Committee 'raptor-friendly' guidelines." The testimony cites the Avian Power Line Interaction Committee's 1994 and 2006 guidelines. The Avian Power Line Interaction Committee published updated guidelines in 2012. We recommend that onsite transmission lines and poles be designed according to guidance contained in the more recent publication.

Page 20, Section E. Summary of the Potential Cumulative Impacts. As described in the testimony, BrightSource describes the potential for cumulative impacts in the context of the measures that it would undertake at the site to reduce the overall effect of this project. We concur that any reduction in adverse effects of one project contributes to an overall reduction in cumulative effects of all projects. The primary purpose of a cumulative effects analysis, however, is to provide an assessment of how the effects of the current proposed action affect the environment when considered in the context of the baseline conditions. In this case, at a minimum, the baseline conditions would include the loss of habitat and impacts to wildlife caused by the development of renewable energy projects in the Mojave Desert. Consequently, as described, we conclude that the testimony inadequately addresses potential cumulative effects.

We agree that the avoidance and mitigation measures described by BrightSource are necessary and appropriate for the proposed action (although we contend that they do not address the issue of cumulative impacts). We recommend, however, that this list include a bird and bat conservation strategy and an eagle conservation plan, given that we expect at least some mortality of birds and golden eagles have been identified onsite. McCrary et al. (1986, cited in the testimony) advise that "The removal of large tracts of desert from biological production for solar power generation and the ecological effects caused thereby should also be of concern." As we have discussed with BrightSource, a bird and bat conservation strategy that includes an element to compensate for impacts to bird habitat through coordination of conservation actions with the regional joint venture program would begin to address impacts in a cumulative manner.

Pages 21 and 22. Section A. Desert Tortoise, Final Staff Assessment, Page 4.2-123 – Desert Tortoise Abundance Estimates. We did not attempt to analyze the Commission's and BrightSource's estimates of the numbers of desert tortoises within and adjacent to the site of the proposed solar facility in detail. Surveys provide a snapshot of one point in time; our survey protocol for desert tortoises allows one to use this snapshot to estimate the number of desert tortoises larger than 160 millimeters (not necessarily adults, as described in the testimony) that may be in the project area. One can then use various means to estimate the number of individuals smaller than 160 millimeters and various assumptions to estimate the number of eggs. This combined information provides us with a reasonable indication of how many desert tortoises are likely to be present in a given area and allows us to conduct a reasonable analysis of the effects of the proposed action on the species, at least in accordance with the regulations and guidelines of the Federal Endangered Species Act.

For these reasons, we will not offer an opinion herein as to which of the numbers presented in the testimony are more correct. Rather, at this point in the process, we are approaching the potential effects of the proposed action on the desert tortoise based on the following information:

1. In general, relatively few desert tortoises occur within the project site.

2. The western portion of the project site does not seem to support desert tortoises, although desert tortoises may occasionally move through this area.

3. Desert tortoises occur in the eastern portion of the project site and their habitat extends farther to the east, into Nevada.

Upon the completion of formal consultation on the proposed action with the Bureau of Land Management (Bureau), pursuant to section 7 of the Endangered Species Act, the Service may determine that translocation of desert tortoises from the project site would be appropriate. In such a case, the direction we provide with regard to the translocation strategy will not change if the number of desert tortoises found on the site is slightly different from that predicted by BrightSource or the Commission. In our biological opinion, we will use the best available information to estimate the number of animals likely to be present; we will also provide an explanation of any estimates that we use. If the proposed action is approved by the permitting agencies and we have issued a biological opinion, re-initiation of formal consultation would be required if, when clearance surveys are conducted, the number of desert tortoises exceeds the estimate upon which our analysis is based.

Pages 23 and 24, Final Staff Assessment, Page 4.2-127 Desert Tortoise Compensatory Mitigation. Because the Service does not require compensation under section 7 of the Endangered Species Act and other agencies are actively discussing this issue, we have no comment on this section.

Page 24, Section B. Avian Flux Impacts. We reviewed the discussion of the potential impacts of flux on birds that is contained in the testimony. In general, the discussion focuses on an analysis that BrightSource conducted of a model prepared by the Commission that is contained in the final staff report for the proposed Hidden Hills project. We found the ideas and concepts in the testimony to be interesting; however, we do not have the expertise to comment on the technical aspects of the analysis.

To the best of our knowledge, researchers have conducted four studies on the effects of operating power towers on birds. The first study (McCrary et al. 1986, referenced in the testimony) was conducted on a relatively small facility near Barstow, California. Researchers concluded that the Solar One facility resulted in the deaths of a relatively small number of birds during the study period. They also concluded that at least some deaths were due to factors that would not be present at the site of the proposed Hidden Hills project: The Solar One facility was located adjacent to a large water impoundment and agricultural fields; additionally, heliostats were occasionally focused on a few standby points, which caused high flux levels in a small area. After factoring in scavenger rates, McCrary et al. predicted a mortality rate of from 1.9 to 2.2 birds per week. Most of the deaths seemed to be from collisions with mirrors, although a few birds clearly had been damaged by flux.

BrightSource conducted the second study, on the effects of flux on recently killed birds, at the Solar Energy Development Center facility in Dimona, Israel. The testimony describes the results of this study.

The testimony also includes two studies where bird use and mortality were monitored at existing power towers: BrightSource's Solar Energy Development Center facility and Torrestal Energy Investments' Gemasolar facility in Spain. BrightSource has detected little mortality at the facility in Israel and no dead birds have been detected in Spain. Based on some fundamental differences between the project sites and the nature of the studies, however, these studies may not offer an adequate comparison in assessing the potential impacts of the proposed Hidden Hills project. For example, at the Dimona project, the study notes that the "outer area is mostly natural desert habitats and contrasts greatly with the developed area inside." By contrast, BrightSource would retain vegetation within the heliostat field at Hidden Hills, which may render this site more attractive to birds. None of the Gemasolar transects seem to lie within the heliostat field; consequently, surveys may not detect dead birds within that area.

Beyond these studies, the Commission and BrightSource have developed models to predict the impacts of flux on birds. Consequently, the two studies that were fairly limited in scope and two models provide the best available information on the effects on birds of flux generated at power tower projects. Consequently, we reasonably conclude that the effects on birds of flux generated by power tower projects of the type and scale being developed in the California desert are not well understood.

To that end, the Service, Bureau, and BrightSource have been working cooperatively to develop a plan for the Ivanpah Solar Electric Generating System to monitor the impacts of operation on birds. As a result of this work, we understand that the development of a robust plan to monitor potential effects and to implement adaptive management is a difficult task. However, we are reasonably confident that this effort will result in the implementation of a plan that is likely to provide us valuable information on mortality rates of birds at the Ivanpah Solar Electric Generating System.

One of the most difficult questions to address is whether birds would be injured by flux but fly too far outside the bounds of survey areas to be detected. If such events occur frequently, surveys would underestimate the impact of the solar plant. We have discussed the use of live birds to assess more accurately the effects of flux; more consideration should be given to this study approach. We recommend that such a study be developed and undertaken by a neutral third party. We also recommend that any birds used in such a study or found onsite during monitoring surveys be sent to the Service's pathology laboratory in Ashland, Oregon, for a detailed analysis. We understand that this laboratory has more refined techniques for examining damage to feathers and other parts of birds than were available to BrightSource for its Dimona study.

In their study of the Solar One facility, McCrary et al. caution that the greater magnitude of industrial-scale power tower facilities may "produce non-linear increases in the rate of avian mortality when compared to Solar One" In sum, we do not believe there is sufficient information available to fully understand how avian species will be affected, and we recommend that third party studies be conducted to fully evaluate the effects. In this way, the Commission will be able to make more fully informed decisions on project siting.

Page 44. Section D. Avian Ocular. Dr. Ivan Schwab's description of the mechanisms of the eyes of birds is very interesting. His conclusions regarding how the proposed solar plant would affect birds, however, are highly speculative. Briefly, Dr. Schwab states that he "believe(s) the chance of significant visual or heat injury to avian species is insignificant" because of "the speed of flight through any flux field." Birds fly fast but their path through the field may not be direct; consequently, exposure times may be longer than Dr. Schwab envisions. He also does not characterize what comprises a 'significant' injury and does not discuss the effects of birds flying through a flux field several times and accruing 'insignificant' injuries during each flight. His other conclusions are based on 'likely' outcomes because of the adaptions in the eyes of birds and their 'learning to avoid direct injury' that may result from the solar field. We have no indication at this time that birds would be able to learn to avoid the effects of flux.

Understanding how the eyes of birds function may prove useful to our ultimate understanding of how the solar plant may affect these species. Speculation, however, is not constructive. We recommend that the agencies cooperate to address this issue via well-defined research, as we discussed previously with regard to avian flux impacts.

Page 54, Section F. Golden Eagle/Migratory Bird Treaty Act/Fully Protected Species. The testimony characterizes the use of the Hidden Hills site by golden eagles as having "limited foraging use of the site, and low occurrence levels" and notes that 5 of the 13 sightings of this species were on a transmission line located "east of the project area." This description of the transmission line is somewhat misleading, in that the transmission line is located mere feet from the eastern boundary of the project site. Given that we do not understand how golden eagles would react to the site, the development of an eagle conservation plan would seem prudent. Such a plan could address how BrightSource would monitor and adaptive manage for golden eagles and could serve as the basis for a permit to take golden eagles, pursuant to the Bald and Golden Eagle Protection Act, if such a permit becomes necessary in the future.

The effect of flux on the feathers, muscles, and eyes of birds is clearly an outstanding issue with regard to the development and operation of BrightSource's power towers. At the present time, we have monitoring studies at a former small power tower where important conditions were different than would exist at Hidden Hills (i.e., Solar One) and at two current power tower sites where the habitat is substantially different than would be present at Hidden Hills (Dimona) or the survey design seems to be inadequate to detect dead birds (i.e., Gemasolar). The study using recently killed birds at Dimona clearly has left the agencies with numerous questions. We recognize that the Commission and BrightSource have developed models that predict different outcomes. The fact is that we do not know how flux will affect migratory birds, including golden eagles, in the Mojave Desert. The Service, Bureau, and BrightSource are developing a monitoring program for the Ivanpah Solar Electric Generating System that we believe can serve as a template for the Hidden Hills project. The Service recognizes that the monitoring program cannot answer every question regarding the effects of flux and so continues to advocate for research, preferably conducted by a third party, that would attempt to answer specific questions with regard to flux. Such research would enable the agencies and BrightSource to assess more

fully the effects of power towers and to design and implement monitoring and adaptive management programs that specifically address these effects.

We appreciate the opportunity to participate in your planning process and look forward to continued cooperation with you and your staff. If you have any questions regarding this letter, please contact Ray Bransfield of my staff at (805) 644-1766, extension 317.

Sincerely,

Diane K. Noda

Diane K. Noda
Field Supervisor