From: Pete_Sorensen@fws.gov
To: Martinez, Pierre@Energy; Watson, Carol@Energy;
cc: Nisa_Marks@fws.gov; Jody_Fraser@fws.gov; Joel_Pagel@fws.gov;
Subject: Rio Mesa
Date: Wednesday, August 29, 2012 1:32:04 PM
Attachments: 20120823_R8_Solar Power Tower questions compiled.docx

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Hi Pierre and Carol,

Could you please ensure that the attached is docketed for the Hidden Hills and Rio Mesa projects?

Attached is the list of questions the Service prepared for yesterday's flux workshop. We are concerned about the increasing number of power tower projects that are proposed or undergoing permitting review, given the outstanding questions about the impacts of utility-scale application of this technology. As such, it would be beneficial to the permitting process for pending and future projects, including Hidden Hills and Rio Mesa, to gather monitoring data that answer some of the questions about avian physiological tolerance and behavioral response to power towers, from already approved projects, before approving more projects. Increasing our knowledge about potential impacts from this technology would further our ability to complete science-based analyses of direct, indirect, and cumulative effects to the avian community, as required by our joint public trust responsibilities. Therefore, we suggest that the Agencies limit the number of power tower projects that are considered for permitting and development until we obtain a more detailed understanding of this technology and its impacts, based on at least a couple years of scientifically robust monitoring. Deploying technology of this scale in multiple places and on a short timeframe without such an understanding compromises our ability to make informed decisions on projects that would permanently and cumulatively impact species and the extensive tracts of desert habitat upon which they depend.

Thank you,

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Additional questions regarding power tower technology, solar flux and potential impacts to avian and bat species.

U.S. Fish and Wildlife Service, August 22, 2012 - Draft

From the information provided to date by BrightSource Energy, we have a basic understanding of how solar power tower technology will be applied at their proposed utility-scale facilities. The U.S. Fish and Wildlife Service (Service) currently understands that for the proposed projects (e.g., Hidden Hills and Rio Mesa), each power plant consists of approximately 85,000 heliostats (mirrors) surrounding a 750' tall tower. Incident solar rays reflect off the heliostats towards the top of the tower, where the concentrated radiant solar power, also known as flux, heats a working fluid to a temperature to power a steam-powered electrical generator. Impacts to avian and bat species from the increased flux levels that result from the concentration of solar energy remain uncertain in the absence of engineering and biological data. A more thorough understanding of the power tower technology is needed to identify whether there are injurious/lethal thresholds to species and additional studies are warranted to evaluate behavior within and around operating facilities.

The Service is concerned about the potential impacts of flux associated with solar power tower technology on species protected under the Endangered Species Act, Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act. We request that BrightSource provide sufficient and scientifically robust data to validate their assertion that avian and bat species will not be impacted by this technology. The flux model output provided on July 23, 2012, in response to Rio Mesa Data Request Set 2A #159, quantifies the area subject to elevated flux levels. However, data thus far provided by BrightSource are insufficient to assess project impacts on avian and bat species. Although we recognize that very little data are currently available, crucial questions remain about project engineering and avian and bat physiology and behavior that are needed to inform our assessment of project effects on avian and bat species. In addition to the information requests identified by the California Energy Commission (CEC) for the joint Rio Mesa and Hidden Hills solar flux workshop on August 28, 2012, (attached) the Service raises the following questions regarding the technology and impacts to species:

Technology and Operation:

1. Specific to Rio Mesa Data Request Set 2A #159, what assumptions were used to generate the flux model output provided?
2. How will levels of flux vary throughout an operational day (i.e., change according to time of day, sun angle, or time since plant startup)? What happens (in terms of reflected light off the heliostats and associated flux) at the end of daily operations?
3. Given that the heliostats are not 100% reflective; will there be localized convective heating of the air around the heliostats? If so, to what temperature, and how does this change through a 24-hour cycle? At what elevation and distance from an individual heliostat would the heat dissipate?

Physiological Tolerance:

1. When considering your responses to the exposure estimate questions identified by the CEC (questions 5-10) please include consideration for variables including an individual's size (e.g. 2-kg turkey vulture, 1-kg western gull, 10-g willow flycatcher) and feather color, and whether this would alter the identified temperature and exposure duration

level. Please provide answers for each of the questions 5-10 with respect to the fur and skin of a bat.

2. If mortality were to occur as a result of elevated flux, what is the likelihood that a carcass would be found on site, (i.e., is there a potential for the individual to incinerate before reaching the ground)?
3. What is the distribution of flux within the solar array? Are there particular areas with elevated potential for causing adverse physiological damage? Would you expect the area of concern to vary by species given your response to question 1 above?
4. What temperature and exposure duration could result in injuries such as temporary or permanent burns to skin, scarring to avian or bat corneas, or other forms of temporary or permanent blinding? Given that eye structure and placement varies between species, is there potential for this impact to be different between families of birds?

In addition to the above, the Service asserts that there are additional questions that will require research and monitoring at an operational power tower facility in order to more thoroughly assess impacts from this technology. These include but are not limited to:

a) What are avian and bat behavioral responses to zones of elevated flux, elevated heat, and the developed area (tower, heliostats)? Does this vary by species, age, sex, time of year, or resident status?
b) If birds and/or bats exhibit avoidance behavior at some time after entering the volume of airspace with elevated flux, when or how quickly does this behavior occur? Does the individual experience any damaging effects before it diverts from the airspace? Is the avoidance response triggered at a specific flux level and how might that vary between species?
c) At night, if a zone of heated air remains around the tower, do birds or bats exhibit a behavioral response to that air space that could increase their risk of collision with the tower or do they avoid the area?

Understanding the magnitude, extent, and types of effects power tower facilities may yield requires consideration of the technology as well as the projects' geographic location and the biological landscape (e.g. the diversity, abundance, and distribution species in the area, and their use of the project site throughout the year). Because the magnitude of impacts may vary based on site-specific biological conditions, it is important that rigorous, scientifically defensible preconstruction and post construction surveys commensurate with a project's location, scope, scale, and permanence on the landscape be conducted.