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United States Department of the Interior

NATIONAL PARK SERVICE
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Washington, D.C. 20240

SEP 1 4 2009

IN REPLY REFER TO:

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Memorandum

To: Director, Bureau of Land Management

From: Acting Director

Subject: Supplemental Scoping Comments for the Programmatic Environmental Impact Statement to Develop and Implement Agency-Specific Programs for Solar Energy Development [74 FR 37051 (June 30, 2009)]

The National Park Service appreciates the opportunity to provide supplemental scoping comments on the Solar Energy Development Programmatic Environmental Impact Statement and has set forth its detailed comments in the Attachment. The NPS also appreciates being accorded cooperating agency status on this important PEIS. In this capacity, the NPS will use its expertise in evaluating potential impacts and in identifying needed mitigation at the regional and local levels related to park air, water, biological resources, soundscapes, night skies, viewsheds, and cultural resources.

Overall, the NPS supports the concept of establishing solar energy study areas to aid in the review of utility-scale solar energy projects. As the Bureau of Land Management examines the merits of siting solar energy projects within the 24 solar energy study areas, we ask that it also evaluate the potential impacts that such projects could have on adjacent units of the National Park System and other special status lands, such as National Trails, National Historic Sites and Landmarks, and National Natural Landmarks, and identify needed mitigation measures to protect them.

At present, it appears that the current direction of the PEIS would create competing policies and/or procedures for a national solar energy development framework. We recommend that the Bureau evaluate the potential environmental consequences of such a dual approach in the PEIS. As part of such an analysis, we recommend that the benefits of adopting a single set of procedures be examined under which all solar projects, including those within and outside of the solar energy study areas, will be treated in a consistent manner.

The need for such an examination in the PEIS is underscored by the fact that over 150 solar energy projects have been proposed on BLM lands throughout the southwestern United States. While some of these projects are contained wholly or partially within the solar energy study areas, the vast majority of these projects are not. In its *Federal Register* notice, the Bureau states that, "Applications received after June 30, 2009 for lands inside the solar energy study areas will be subject to the Record of Decision (ROD) for the Solar PEIS and any alternative procedures

developed by BLM for non-competitive and competitive processes." All applications received for lands outside of the solar energy study areas will be processed under the BLM's current procedures." As a result, it appears that the Bureau plans to have 2 processes and potentially 2 levels of resource protection with respect to the permitting of solar energy projects, including their related ancillary facilities, on BLM-managed lands.

We also recommend that the BLM evaluate the sustainability of developing various solar energy technologies in the study areas. For example, it would be useful to examine whether the use of water-cooled technology in water scarce desert regions is a sustainable practice. Such an evaluation may reveal that water may be a more critical constraint affecting the deployment of water intensive solar technology than either the availability of land or the intensity of sunlight.

Finally, it would be helpful if the BLM would clarify how the in-depth environmental analyses of the solar energy study areas will be handled, especially with regard to cumulative impacts. Accounting for cumulative impacts will need to include impacts from other renewable energy projects in the surrounding area too. In addition, potential impacts from applications that were filed prior to June 30, 2009, need to be analyzed in the PEIS as part of the cumulative effects analysis. Having the results of such a comprehensive, cumulative analysis will be beneficial in helping to guide future decisions as to the optimal mix of appropriate solar technologies on BLM-managed lands. Our understanding is that the goal is to optimize energy production in a way that protects the environment, which includes the protection of park units and other special status areas.

For additional information, please do not hesitate to contact me or Dan McGlothlin, with the NPS Water Resources Division, at 970-225-3536, or at Dan_McGlothlin@nps.gov. I have asked Dan to work with your staff to formalize our role and responsibilities as a cooperating agency in the PEIS effort.

Attachment

cc: Linda Resseguie, BLM Washington Office

ATTACHMENT

National Park Service Comments on the Programmatic Environmental Impact Statement to Develop and Implement Agency-Specific Programs for Solar Energy Development

I. Comments on Specific Solar Energy Study Areas

The NPS recommends that the PEIS include an evaluation of the potential impacts to units of the National Park System and special status lands and needed mitigation measures to protect them.

Amargosa Valley (NV)

The Amargosa Valley study area is located in the Amargosa Desert of southern Nevada in an area where solar potential is high, but water is extremely scarce, and requirements to reduce the amount of water consumption are warranted. The NPS possesses the most senior groundwater water right in the Amargosa Desert hydrographic basin, for Devils Hole, a detached unit of Death Valley National Park. The Nevada State Engineer recently determined that only 7,000 acre-ft per year of groundwater is available for development in the Amargosa Desert hydrographic basin (Ruling 5992) and that current groundwater withdrawals, approximately 15,000 acre-ft per year, exceed the amount of groundwater available for development by about 8,000 acre-ft per year. Numerical groundwater modeling suggests that current levels and locations of groundwater pumping in Amargosa Desert will lower the water level in Devils Hole, and impact the sensitive water resources protected by this water right. Therefore, a solar energy project within the Amargosa Desert that proposes the use of groundwater under an existing water right could face possible curtailment.

Currently, a 500 MW water cooled facility in the Amargosa Desert hydrographic basin proposes to use about 6,000 acre-ft per year of water, or about 85% of the total that is available for use in the basin. The proposed facility is outside the Amargosa Valley solar energy study area but within the Amargosa Desert water rights administration area. Thus, one wet cooled facility outside of this study area could require curtailment of nearly all other water use in the basin and would likely preclude the development of any other solar energy project in the basin, including within the Amargosa Valley study area. The BLM and project proponents need to be aware of these potential operational risks when permitting water intensive solar projects in the Amargosa Desert hydrographic basin. The cumulative effects of all proposed solar energy projects in a region need to be evaluated, whether or not they are within a solar energy study area.

Dry Lake and East Mormon Mountain (NV)

Solar projects in the Dry Lake and East Mormon Mountain study areas have the potential to pose significant impacts to groundwater resources in Lake Mead National Recreation Area. Concentrated solar power projects proposed for the Dry Lake and East Mormon Mountain study areas in southern Nevada will likely be competing with Las Vegas and other groundwater developers in the area for limited supplies of groundwater in the basins north of Lake Mead NRA. The search for water to satisfy the demand for any proposed wet-cooled concentrated

solar power projects is likely to target groundwater from the regional carbonate-rock aquifer, which also discharges naturally at several large springs within Lake Mead NRA. Theses springs provide critical habitat for a small number of threatened species and therefore are very important to the park to protect against future impairment.

Potentially complicating the appropriation of a sufficient amount of new water rights for solar projects in these study areas is a 2002 order (Order 1169) by the Nevada State Engineer that currently holds in abeyance all pending applications and any new filings for the appropriation of groundwater from the carbonate-rock aquifer system in several surrounding basins until further studies are completed to evaluate the effects of pumping existing water rights on the carbonate-rock aquifer in these basins. Additionally, 2001 and 2002 rulings (Rulings 5008 and 5115) by the Nevada State Engineer have established a precedent that they may be reluctant to grant new water rights for water-cooled power plants in southern Nevada. Assuming any solar project developers secure new or existing water rights from the carbonate-rock aquifer for their proposed project, it is critical that individual and cumulative effects to groundwater resources in the hydrologically-connected basins north of Lake Mead NRA are evaluated in the PEIS process for all reasonably foreseeable projects proposing to use groundwater from this regional aquifer.

Riverside East (CA)

The Riverside East study area is located near the southeastern boundary of Joshua Tree National Park. Utility scale solar energy development in this study area has the potential to directly impact park resources. Specifically, such development could change the biological corridors, hydrology, and soil movement within and between the Eagle Mountains, Pinto Basin, and Coxcomb Mountains – all within the park.

Solar projects in this area have the potential to pose significant impacts to limited groundwater resources in the Chuckwalla Basin and surrounding hydrologically-connected basins. Concentrated solar power would compete with the proposed Eagle Mountain pumped storage project and a proposed landfill for limited groundwater supplies in the Chuckwalla Basin. These two projects are proposed at the former Eagle Mountain mine site situated between the southeastern boundary of Joshua Tree National Park and the western extent of the solar energy study area. The pumped storage project alone is currently estimating that it will require over 20,000 acre-feet of groundwater from the Chuckwalla Basin to fill two surface reservoirs in order to initiate hydroelectric power generation, and will require approximately 2,000 acre-feet annually to replenish reservoir losses due to evaporation and leakage.

Permitting of wet-cooled concentrated solar power projects within this study area could pose additional impacts to groundwater resources in the Chuckwalla Basin and surrounding basins like the Pinto Basin, which is located in the park. The Pinto Basin is located immediately up gradient of the Chuckwalla Basin and is known to be hydrologically connected to the Chuckwalla Basin. As a result, it is critical that individual and cumulative effects to groundwater resources in the Chuckwalla Basin and other hydrologically-connected basins are evaluated in the PEIS process for all reasonably foreseeable projects proposing to use

groundwater as part of their operation, including solar, the proposed pumped storage and landfill projects.

The areas along the southeastern portion of Joshua Tree National Park are known bighorn sheep habitat. Research has been conducted, but not yet published, regarding the herd around the Eagle Mountain and Mine areas which concludes that this population is healthy and in good standing. There is also a well-known bighorn sheep corridor between the Coxcomb Mountains and the Cottonwood area, through the Eagle Mountain and Mine areas. Potential development in these areas should be evaluated for its effect on bighorn sheep habitat and bighorn sheep movement patterns.

Solar energy development in the Riverside East study area has the potential to impact several rare and endangered plants occurring in or near Joshua Tree National Park and listed on the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants:

- A new species of *Mentzelia* was discovered in the southern portion of the Coxcomb Mountains within Joshua Tree National Park. Solar energy development in the Riverside East study area has the potential to isolate this portion of the habitat in the park from Palen Dry Lake, Chuckwalla Valley, and the neighboring Sonoran desert mountains.
- The sand dune habitats at the eastern end of the Eagle Mountains currently support two CNPS listed rare plants (*Cryptantha costata, Eriastrum harwoodii*), and one watchlist plant (*Astragalus aridus*). This is the only place these plants occur in Joshua Tree National Park. Development in the western portion of the Riverside East study area could directly impact the quality of habitat for these species, which require fine sand, by altering the natural hydrology and sedimentation processes in the area.
- There are known populations of the following CNPS listed species within the footprint of the Riverside East study *area: Colubrina californica, Senna covesii, Ditaxis californica, Ditaxis claryana, Abronia villosa var. aurita, Hymenoxys odorata, Teucrium cubense ssp. depressum, Wislizenia refracta ssp. refracta, Grusonia parishii, Astragalus insularis var. harwoodii, Corypantha alversonii, and Proboscidea althaeifolia.* Potential impacts and opportunities for mitigation need to be evaluated with respect to these species in the PEIS.

Pisgah (CA)

Solar energy development in the Pisgah study area has the potential to imp*act several rare and endangered plants occurring on the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants:*

- *Penstemon albomarginatus,* a CNPS List 1B.1 species, is an extremely rare plant; the only other known population is near Primm, NV, an area also under consideration for solar energy development.
- *Androstephium breviflorum* and *Penstemon albomarginata,* CNPS listed plant species, occur in the study area.
- *Castela emoryi*, CNPS List 2.3, may be impacted by development in the Pisgah, Riverside East, and Iron Mountain study areas.

Development in the Pisgah study area may directly and negatively impact the habitat and population of a newly described species of lizard (*Uta pisgahensis*) which was discovered to exist in the footprint of this study area.

It is important to note that the Pisgah study area includes lands that were purchased and transferred to BLM for the sole purpose of conservation. BLM should consider excluding these lands from the study area.

Iron Mountain (CA)

The Iron Mountain study area is only a portion of a much larger area under consideration for solar energy development near northeastern portion of Joshua Tree National Park. Not included in this study area is an additional 60,000 acres being considered for solar energy development adjacent to the northeast corner of the park, near the Coxcomb Mountains. The combined effects of solar energy development on public lands within and outside the study area adjacent to the park have a high potential to directly and negatively impact park resources in Coxcombs. For this reason, we suggest there should be a reduction in the acreage currently under consideration for solar energy development near the northeast corner of the park.

Solar energy development in the Iron Mountain study area has the potential to impact rare and endangered plants occurring within or near Joshua Tree National Park and listed on the CNPS Inventory of Rare and Endangered Plants:

- *Androstephium breviflorum*, a CNPS List 2.2 species, exists within and near the Iron Mountain study area. This plant occurs in low numbers in sporadic populations, including a few within the boundary of Joshua Tree National Park. Loss of any populations within this region will impact the long-term viability of these populations and may cause its extirpation within the park.
- *Eriastrum harwoodii* is found within the study area; this is a CNPS List 1B.2 species.

Red Sand (NM)

The Red Sand study area is located immediately adjacent to White Sands National Monument. The dunes of White Sands National Monument are maintained by the presence of a perched aquifer. Throughout the dunes, groundwater is present only 18-36 inches below the surface. The dunes wick water up to their crest, with moisture present immediately below the surface at the tops of the dunes. This high water table holds the dunes together, preventing them from rapidly eroding. If the perched aquifer were to decline, it is likely that the dunes would blow away over time, leading to the destruction of the monument's primary resource.

We do not currently fully understand the hydrogeology and whether or not the perched aquifer may be related to the deeper aquifers of the Tularosa Basin. Thus, we are very concerned about the potential for this perched aquifer to be disrupted through the development of groundwater resources outside the monument within the Tularosa Basin.

We suggest that for any PEIS alternative analyzing the use of surface or ground water, the environmental document should quantify the amount of water necessary, and from where it would be obtained. Presumably, water for this development would come from groundwater sources since we are not aware of any surface water resources in this area. It is unknown at this point how the development of groundwater resources immediately outside of White Sands National Monument would affect the perched aquifer inside the park. Even if the development were to utilize surface water, it could still affect groundwater by reducing the amount of infiltration available. In addition, groundwater in this area generally has extremely high total dissolved solids. These solids also may affect the feasibility of using groundwater for cooling.

We recommend that the PEIS fully examine the use of air cooling technology for concentrating solar development to avoid the need for vast amounts of groundwater. If the PEIS analysis indicates the need for significant water resources in this area, then we request that a project-specific study of the hydrology of the area be completed, with particular focus on how the development of water resources could affect White Sands National Monument. The NPS could assist BLM in this analysis to better understand the underground hydrology of the Tularosa Basin, and how solar energy development projects may affect White Sands National Monument.

We also recommend that the bureau include a visual analysis in the PEIS to indicate whether or not development associated with a solar energy field would be visible from White Sands National Monument. Depending on how facilities are sited, it is very possible that it may be visible from the park's National Register-listed visitor center. Thus, impacts to this historic resource should be considered. Depending on what is proposed, the facilities could also be visible from locations along the park's Dunes Drive. In addition, because of the proximity to White Sands, we also request that BLM carefully consider the impacts that solar energy development in the study area may have on night lighting and on natural soundscapes.

We do not anticipate that the other study areas (Mason Draw), as depicted on the BLM's June 5, 2009, map, would have any impacts to White Sands National Monument. These areas are outside of the Tularosa Basin and are in a separate hydrological unit.

Wah Wah (UT)

The Wah Wah study area is located in the Wah Wah Valley approximately 50 miles southeast of Great Basin National Park, and 20 miles northwest of Milford, in Beaver County, Utah. Great Basin National Park is located in the Snake Range of Nevada and adjacent to Snake Valley, in Baker, Nevada. The Wah Wah Valley lies up gradient of Snake Valley and interbasin movement of ground water from Wah Wah Valley is toward Snake Valley. The search for water to satisfy the demand for any proposed solar power projects in Wah Wah Valley and adjacent valleys is likely to target groundwater from the regional carbonate-rock aquifer known as the Great Salt Lake Desert Ground-Water Flow System.

Solar power projects proposed for the Wah Wah study area will likely be competing with Las Vegas, Central Iron County Water Conservancy District, and Beaver County for a limited supply of groundwater in the regional system. Groundwater plays an important role in maintaining the

features and ecology of Lehman Caves and water-dependent resources including streams and springs located on the eastern side of Great Basin National Park in Snake Valley. The principal effect of ground water withdrawals in Wah Wah Valley and adjacent valleys is a reduction in the quantity of subsurface outflow to Snake Valley, or alternatively, reversal of subsurface flow from Snake Valley toward these valleys, potentially reducing or eliminating spring and stream discharge.

Assuming any solar project developers secure new or existing water rights within the regional aquifer system for their proposed projects within the study area or adjacent valleys, it is critical that individual and cumulative effects to groundwater resources in the hydrologically-connected basins near Great Basin National Park are evaluated in the PEIS process for all reasonably foreseeable projects proposing to use groundwater within the regional aquifer.

II. Resource-Specific Comments

Water

As the BLM proceeds with its analysis and permitting of utility-scale solar energy projects, it is important to consider the potential impacts on water resources for all proposed projects located in the vicinity of units of the National Park System. With this in mind, as noted in the NPS's initial scoping comments on this PEIS effort, we urge the BLM to consider possible cross-boundary or even regional impacts associated with large-scale solar projects.

The PEIS should carefully consider the findings of existing studies on water use for solar energy projects. The interdependence of energy production and water use is well documented by the Department of Energy. A report prepared by the Department of Energy (Source: Report to Congress titled Concentrating Solar Power Commercial Application Study: Reducing Water Consumption of Concentrating Solar Power Electricity Generation) states that water consumption in the Mojave Desert is an issue with concentrating solar projects because areas of the Mojave where the sun is most intense are the same areas where water is scarce.

The PEIS should consider the establishment of programmatic water-use policies to encourage the maximum conservation of water by solar energy projects in water-limited areas, including the study areas within the Mojave Desert. A model for such an approach is the policy of the California Energy Commission regarding the use of fresh water for power plant cooling. The CEC policy reflects a desire to minimize the consumptive use of fresh water for power plant cooling, and use of such water is approved "only when it is demonstrated that the use of other water supply sources or other methods of cooling would be environmentally undesirable or economically unsound." The PEIS should also consider whether "once-through" cooling systems are appropriate in water-limited areas, including the study areas of the Mojave Desert.

Trails

The NPS Intermountain Region, National Trails Office co-administers with the BLM the following two National Historic Trails that have the potential to be impacted by the proposed

solar energy development sites that are presented in the Solar Energy PEIS: El Camino Real de Tierra Adentro National Historic Trails in New Mexico, and the Old Spanish Trail, which traverses the states of Colorado, Nevada and Utah. Congress designated these trails to identify and protect "the historic route and its historic remnants and artifacts for public use and enjoyment" (National Trails System Act, P.L. 90-543, as amended).

The types of resources that have the potential for being impacted by proposed solar energy development are trail remnants and associated archaeological sites, structures, buildings, natural landmarks, and the general cultural landscape. Trail remnants can be obvious swales, and ruts, subtle changes in elevation and/or vegetation, or alignments that have no obvious surface indications. Adverse impacts to the trails and associated cultural resources could include, but are not limited to, blading, trenching, vehicular traffic, and subsequent maintenance and repair of infrastructure. Adverse impacts to the setting could include visual impacts from the solar fields and from associated transmission lines, roads, and other ancillary development. We encourage BLM to carefully consider potential impacts to these National Trails in the alternatives developed for the PEIS.

General Biologic Resources

In addition to formally listed Threatened and Endangered (T&E) species, other rare or imperiled species and biological communities should be evaluated in the PEIS. For example, we suggest that BLM obtain lists of such species and communities from the various State Natural Heritage programs in each of the six states encompassing solar energy study areas. Maintenance of habitats for T&E or rare or imperiled organisms or groups is increasingly important under climate change response scenarios.

We also suggest that the PEIS analyze "footprints" of project infrastructure and support infrastructure (e.g., roads, transmission lines), how they are designed, placed, constructed and operated for their potential influence on:

- Establishment and spread of non-native species.
- Long-term recovery potential of soils, aquifers, species and biological community structure and function when infrastructure is removed and/or operations cease.
- The movement, migration, or dispersal of organisms, seed, or pollen (particularly for rare species) among habitats and/or populations or meta-populations.
- Influences on the behavior of organisms and on regional foodweb structure.

In addition, we recommend that the PEIS:

- Review potential impacts at multiple spatial scales and multiple levels of resource organization.
- Include analysis of new infrastructure and changes to existing infrastructure and related traffic patterns and land use changes.

Cultural Resources

We recommend that the PEIS contain an analysis of prehistoric east/west trail networks that supplied coastal and Colorado River trade items to the greater region. There is also a potential for direct impacts to General Patton's WWII training areas, and Metropolitan Water District aqueduct resources, however, the NPS does not maintain, nor have jurisdiction over these areas. Additionally, in reference to lands not in the Riverside East solar energy study area, CREZ 38 lands, north of the Joshua Tree National Park boundary, lie within a known ecological linkage, as studied and designated in SouthCoast Wildlands report, "A Linkage Design for the Joshua Tree - Twentynine Palms Connection, December 2008." Other known linkages were recently published on a CEC map, dated 7/14/2009.

III. Information for BLM to consider and use in the draft PEIS

Three of the four California solar energy study areas, plus one in Nevada, are located on or within 10 miles of the boundary of Joshua Tree and Death Valley National Parks. The eastern Riverside study area will completely surround one of Joshua Tree National Park's unique mountain ranges; the Iron Mountain study area is within 10 miles of the same mountain range in Joshua Tree National Park; and the Amargosa Valley study area in Nevada is very near the boundary of Death Valley National Park.

The Amargosa Valley study area consists of approximately 32,000 acres of pristine habitat. The Eastern Riverside study area encompasses approximately 406,000 acres, over half of which is directly bordering Joshua Tree National Park on pristine habitat; the Pisgah study area consists of approximately 28,000 acres of pristine habitat; the Iron Mountain study area contains approximately 113,000 acres of pristine habitat.