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**Subject: Protection of Groundwater and Groundwater Dependent Communities in the Development of the Desert Renewable Energy Conservation Plan**

Docket Number: 09-RENEW EO-01

The Nature Conservancy (the Conservancy) respectfully submits the attached letter that contains our recommendations, and provides our recent scientific assessments related to groundwater and freshwater dependent species, to inform how the Renewable Energy Action Team and staff should address groundwater and groundwater dependent species and communities in the development of the draft Desert Renewable Energy Conservation Plan (DRECP). As a stakeholder in the DRECP process, our organization supports this critical plan and we thank you for the opportunity to share these resources and our recommendations. This letter will be filed to the California Energy Commission Docket Office via email.

If you have any questions, please do not hesitate to contact me at (760) 365-5457 or lcrane@tnc.org.

We look forward to continuing to work collaboratively on the Desert Renewable Energy Conservation Plan.

Sincerely,

Laura Crane
Director, California Renewable Energy Initiative
The Nature Conservancy

**Enclosed:** *Protection of Groundwater and Groundwater Dependent Communities in the Development of the Desert Renewable Energy Conservation Plan*

cc:
James Kenna, California State Director, Bureau of Land Management via email: jkenna@blm.gov
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# Protection of Groundwater and Groundwater Dependent Communities in the Development of the Desert Renewable Energy Conservation Plan

## I. Introduction and Summary of Recommended Strategies

The Nature Conservancy (the Conservancy) is a world-wide conservation organization, devoted to preservation of the lands and waters upon which all life depends. Striving to maintain fresh water flows for nature and people in the face of drought and climate change is an increasingly critical aspect of our work, in California, across the United States, and globally.

The Conservancy actively participated in the federal Solar Programmatic Environmental Impact Statement (SPEIS) process, is a formal stakeholder in the Desert Renewable Energy Conservation Plan (DRECP) process, and has commented on individual renewable development project proposals. The protection of groundwater and related surface water flows—the streams, springs, seeps, and wetlands on which the survival of so much desert life depends—is a critical component of our work. Development of renewable energy in the desert almost invariably depends on consumptive use of groundwater, and represents a new use of water in our arid landscape. Careful regulation of water use is both warranted and increasingly important for people and nature dependent on that water in the face of drought and likely climate change-driven long-term water shortages.

We believe that federal and state agencies have made substantial progress in recognizing the importance of protecting desert groundwater, adopting best management practice requirements and mitigation goals for groundwater pumping in the face of difficult historic legal and regulatory standards. While we applaud this progress, we believe that more needs to be done. In particular, we recommend that the DRECP provide a framework for ensuring the long-term protection of groundwater resources for groundwater dependent habitats and species, as well as describe a

specific set of adequately protective requirements for desert groundwater and groundwater dependent species.

The purpose of this letter is to present the Conservancy's recommendations for how the DRECP should include protective measures for groundwater and groundwater dependent resources as well as to share data from two Conservancy studies (presented in Appendix A). The Conservancy has previously submitted comments to recommend how the DRECP should include and treat groundwater in the plan, and has shared the Conservancy's paper *Principles for Responsible Water Use by Solar Energy Facilities in the Southwestern Deserts of the U.S.* to the DRECP.[1] The paper is presented in Appendix B and is the foundation for the views expressed within this letter. To further support the adoption of a robust set of programmatic groundwater protective measures in the DRECP, we also discuss, as precedent, examples of state and federal agency actions and positions taken that support reasonable groundwater regulation.

In this letter (Section V), we provide our detailed recommendations for protecting groundwater and groundwater dependent communities in the development of the DRECP. These recommendations are summarized as follows.

**We strongly recommend that the DRECP:**

- Create procedures to minimize water use, especially groundwater.
- Limit groundwater withdrawals from desert basins to no more than the sustainable yield.
- Identify and protect all groundwater dependent resources.
- Improve knowledge of desert basin hydrology.
- Require predictive monitoring, modeling, triggers and compensation for groundwater pumping in all project approvals.
- Include groundwater protection as a fundamental component of the DRECP, as the planning agencies have the statutory and regulatory command to do so.

[1] The Nature Conservancy to California Energy Commission Docket Office (Docket Number 09-RENEW EO-01), Comments of The Nature Conservancy to the *Description and Comparative Evaluation of Draft DRECP Alternatives.* March 16, 2013. (See Recommended Strategy 5, page 4 and Attachment 1, pages 23-26).

## II. Groundwater and Groundwater Dependent Species Information

The presence of many desert springs and wells in the Mojave and Colorado Deserts has been known since at least the early twentieth century, informed by millennia of Native American use,[2] but formal efforts to map and collect multi-year information about desert surface water features and associated biological communities has not occurred. As one example, a baseline series of information about Mojave Desert springs has not been collected. To the extent that some data has been collected, it has not been assembled, analyzed, and integrated into an accessible database. This should be a high priority of the DRECP.

In most California desert basins, reliable information about groundwater hydrogeology and linkages between groundwater aquifers and surface water resources is scarce, posing very significant problems for prudent groundwater management. Spring hydrology, water chemistry and specific biological condition data, including species presence information, are unavailable for most groundwater–fed features. Basin hydrogeology, including aquifer characteristics, storage and recharge rates, water levels, inter-basin flows, overdraft status, and current and historic withdrawal rates are largely unknown or controverted across much of the desert.

A significant amount of work has already been done, by the Conservancy and others, to describe and map California's groundwater dependent ecosystems, species occurrences, vegetation communities, and wetland areas. This work is an excellent platform from which to begin to devise overall protective strategies for groundwater dependent ecosystems, and a basis to determine what additional work needs to be done to protect specific species and habitats. Appendix A presents an overview of two reports and databases by The Nature Conservancy: *Mapping Groundwater Dependent Ecosystems in California*[3] and *Below the Surface: California's Freshwater Biodiversity.*[4] We ask that this information and the associated data layers be included in the DRECP database and used in fashioning new policies and measures to protect water-dependent resources.

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[2] See, e.g., Some Desert Watering Places, Mendenhall, USGS Water Supply Paper No. 224, 1909.
[3] Howard J, Merrifield M (2010) Mapping Groundwater Dependent Ecosystems in California. PLoS ONE 5(6): e11249. doi:10.1371/journal.pone.0011249
[4] Howard, Jeanette, Kirk Klausmeyer, and Kurt Fesenmyer. 2013. *Below the Surface: California's Freshwater Biodiversity*.The Nature Conservancy of California. San Francisco, CA. 20 pp.

We are submitting this information to improve the understanding of desert water and water-dependent resources in the DRECP, recognizing that there are still some significant data gaps. Where the databases we are submitting need to be supplemented, we request the DRECP seek additional resources to provide essential missing information. By both improving the knowledge of desert water and water-dependent resources and by setting conservative and protective regulatory measures in the DRECP, we believe it's possible to develop renewable energy while also protecting irreplaceable ecological resources.[5]

We understand that acquiring adequate information about desert groundwater aquifers and linked surface water expressions can be resource intensive, requiring, among other things, data from multiple wells, expert time and sophisticated models. Available basin-wide studies are often focused on regional water management. To protect water-dependent ecological resources, we recommend that the DRECP scope any regional water analysis to include features that are of vital importance to wildlife, such as springs, water holes, and small surface flows. Furthermore, when pumping from a desert groundwater basin is proposed, and where adequate knowledge of the hydrology is absent, we believe that the proper regulatory response is to establish demonstrably conservative requirements that will minimize long-term risks to groundwater dependent resources. The DRECP will need regional hydrologic models, based on sufficient real groundwater data, to set realistic adaptive measures and to ensure that any requirements are appropriately conservative. These models need sufficient real groundwater data to produce reasonable outcomes. We outline in Section V how these requirements can be structured in the DRECP.

## III. Regulatory and Legal Structures

In California, the absence of information is compounded by the regulatory and legal structures that apply to groundwater. Apart from county rules,[6] the adjudicated basins, and isolated other situations, the State of California does not regulate groundwater pumping. The obvious and important connections between groundwater aquifers and surface water flows are not formally

[5] Irreplaceable ecological resources have been lost due to groundwater pumping. For example, springs have gone dry and endemic and listed species have been lost (or survive only in refugia) in the Las Vegas and Pahrump Valleys in Nevada due to groundwater pumping. The iconic Devils Hole pupfish survived incipient water level declines and extirpation following a decision of the US Supreme Court that limited nearby pumping. *Cappaert v. United States*, 426 U.S. 128 (1976).

[6] County governments can and do impose requirements to regulate and protect groundwater. Where rules exist, they usually do not specifically address and protect ecological water needs. See, e.g., Inyo County Ordinance No. 1004, primarily designed to combat groundwater exports from the county to Los Angeles.

recognized. Moreover, federal agencies customarily defer heavily to state water laws and regulations, which do not provide significant protection for ecological resources.

Despite the absence of specific state and federal rules governing groundwater withdrawals, there are indirect, but very effective, means to protect groundwater and groundwater dependent resources. These include the federal and state endangered species acts, the federal National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA), the Federal Land Policy and Management Act (FLPMA) and regulations and policies adopted under the authority of these statutes. The Public Trust Doctrine[7] can and should be extended to provide additional protection in California to groundwater and water dependent ecological resources. The DRECP should contain a clear discussion of the jurisdictional bases for groundwater regulation in the Plan, and, in particular, assert the necessity and justification for protection of groundwater and related water dependent resources.

## IV. Groundwater Precedent in Solar Planning and Permitting Proceedings

Several examples of how agencies have handled groundwater issues in planning and solar permitting proceedings to date provide useful insight and guidelines into how these issues might be resolved in the context of the DRECP. These examples demonstrate that agencies have, and have asserted, adequate regulatory authority to set protective requirements, but how that authority is applied in individual cases often varies—illustrating the need for more uniformity in the DRECP.

1. *Bureau of Land Management (BLM)/Department Of Energy Solar Programmatic Environmental Impact Statement*

The SPEIS addressed groundwater by providing that solar projects minimize water use and employ the mitigation hierarchy and best management practices to protect groundwater dependent resources, especially listed and sensitive species and riparian vegetation. The pre-decisional final version of the SPEIS also specified that project groundwater pumping should not exceed the perennial or safe yield of basins. However, the Record of Decision (ROD) (at page 57 et. seq.) made clear that these requirements were flexible and could be altered on a case-by-case

[7] See, e.g., National Audubon Society v. Superior Court of Audubon County, 33 Cal. 3rd 419 (1983), and the discussion in Swenson, *Public Trust Doctrine and Groundwater Rights*, 53 U. Miami L. Rev. 363 (1998).

basis. The ROD did not specify mitigation requirements for groundwater use. While it also generally required the acquisition and use of adequate hydrological information before permitting solar facilities that would use groundwater, the ROD noted that, at least for Solar Energy Zones (SEZs), the BLM-generated hydrological information and modeling contained in the SPEIS might satisfy this demand (ROD, page 50). The SPEIS generally required monitoring and modeling groundwater resources, but was not specific about how it was to be done nor the responsible party(ies). The SPEIS did not specify consequences if groundwater monitoring detected damage to ecological resources. It is also not clear the extent to which groundwater-related requirements might differ for pre-existing projects that are not covered by the SPEIS, projects located in SEZs, and variance-area projects. In sum, the SPEIS endorsed and did not rule out protective and well-designed groundwater provisions, but provided significant leeway and left much of the work up to individual project approvers.

*2. CEC Views on Groundwater Protection in the Hidden Hills Case*

The CEC staff recommendations on groundwater for the proposed Bright Source Hidden Hills proceeding[8] provided a number of protective and proactive measures and can serve as an example of measures that can be taken to protect groundwater dependent systems. (A summary of BLM's role in that proceeding is also discussed, below). The CEC staff, recognizing the importance of protecting groundwater dependent resources (that were located on federal public land in Nevada but could be impacted by groundwater pumping in California at the Hidden Hills proposed location) and the inadequacy of existing groundwater information, required the project proponent to collect additional data, conduct additional groundwater testing, and modify its groundwater modeling. The staff recommended a significant multi-well predictive monitoring system and reductions in pumping if the monitoring system indicated that adverse effects on a spring were likely. It also recommended compensatory mitigation in the form of acquisition of senior groundwater rights in the same groundwater basin, most of which is located in Nevada.

[8] The Hidden Hills project was proposed to be located in the Amargosa River watershed in the eastern Mojave Desert near Tecopa, California. The project proponent asked for suspension of the proceedings after the final staff report had been released and CEC subsequently concluded the hearing.

For this project, the staff recommended a protective framework for groundwater dependent resources[9] that the DRECP should consider for all project approvals, as well as for the assessment of potential impacts to protected areas. The four components of the protective framework include:

1. Predictive monitoring
2. Collection of adequate hydrological information, used in fine-scaled models
3. Adaptive management employing trigger conditions for reductions in pumping
4. Compensatory mitigation for groundwater withdrawals

To elaborate, the first component of the framework for protecting groundwater dependent resources was mandatory predictive monitoring, especially where sensitive resources, springs or other surface water may be affected. In addition, the staff recommended that CEC require adequate hydrological information and data (to be collected before project approvals would be considered), coupled to appropriate fine-scaled models. Finally, the CEC recommended employing trigger conditions that require reductions in pumping if adverse impacts are likely and full compensatory mitigation for groundwater withdrawals. Of note, the CEC recognized a duty to consider and avert the effects of groundwater pumping from project wells located in California on Nevada resources. Cross-border effects are a critical issue, especially in the Amargosa watershed, that should be reflected in the DRECP. The DRECP represents an excellent—perhaps the only--vehicle to assure that groundwater protection requirements are uniformly applied across all projects subject to federal and state environmental reviews, and that adverse effects of project pumping are addressed wherever they may extend, irrespective of political boundaries.

### *3. BLM Views on Groundwater Protection in the Hidden Hills Case*

BLM participated informally in the CEC's Hidden Hills proceeding,[10] offering several letters signed by both California and Nevada state directors that focused in large part on strengthened groundwater protection. Two letters are attached (Appendices C and D). The agency supported

[9] The Nature Conservancy believed additional measures would have been necessary ensure protection on the groundwater dependent resources associated with the Amargosa River. The CEC staff concluded that the long-term effects on the Amargosa River were possible, but speculative.

[10] The Hidden Hills project also required a federal EIS because transmission to serve the project would be routed over public lands in Nevada; the agency's comments to the CEC on the project were signed by, and reflected the views of, both the California and Nevada state BLM directors since the projects affected both states.

and reinforced many of the CEC staff recommendations, but advocated stronger and more extensive protection for groundwater and groundwater dependent resources. Most notably, while the CEC staff largely dismissed potential effects on, and mitigation directed at, the Amargosa Wild and Scenic River resources, BLM recommended targeted monitoring for effects on the river, even though the project pumping sites were quite distant from the river and might take a very long time to have an effect on the river and its tributaries. The BLM noted that the substantial uncertainty in hydrological information—even after the developer collected additional data—and concluded that the irreversibility of effects once they were noticed at the river justified conservative project conditions. We believe that this is the right approach, and that even the modest probability of significant long term harm to critical resources should require regulatory protection. The BLM supported a much more extensive predictive monitoring network to protect both the Amargosa River in California and the Stump Springs Area of Critical Environmental Concern (ACEC) in Nevada. The agency recommended strong trigger conditions (water level declines in monitoring wells on the project site or toward ecological resource locations) that would require reduction or cessation in pumping if adverse effects were likely, placing the burden of proof of contesting causation on the developer, and rejecting primary reliance on vegetation-health assessments. BLM also proposed acquisition and retirement of senior, active water rights in multiples of project pumping levels.

BLM's recommendations raise a critical focus on three related points about groundwater regulation that the DRECP should take into account when developing a framework to protect groundwater dependent systems:

1. Even slight declines in the water level of a groundwater aquifer can devastate springs, wetlands and water dependent ecological communities.
2. The effects of groundwater pumping on surface water resources are difficult to predict and trace, and, once those effects are noticed, it is often too late to take corrective action, since pumping-related declines can continue to propagate long after pumping is halted.
3. Groundwater dependent resources are often located at considerable distance from pumping locations to which they are linked, necessitating carefully designed predictive monitoring programs to avert adverse effects that may take a very long time to show up at surface water locations.

*4. Groundwater in the Riverside East Solar Energy Zone*

The Riverside East SEZ (RESEZ) hosts two large scale solar projects under construction and at least nine additional applications, primarily on federally managed lands. All of these projects will rely wholly or substantially on local groundwater supplies from the Chuckwalla Basin. Uncertain about whether the basin is currently in overdraft and particularly desiring to keep current and future cumulative pumping within the sustainable yield[11] of the basin, BLM launched a significant research study with a number of partners to determine a basin water balance (inflows and outflows) and obtain other baseline information to assist the agency in devising a first rate groundwater model and setting groundwater requirements for solar plants.[12] The study was necessitated in large part because of uncertain hydrology, and controverted basin recharge estimates, varying by about a factor of four.

BLM's proposed standard for groundwater withdrawals in the Chuckwalla—limiting cumulative pumping to the sustainable yield of the basin, and preventing overdraft—is sound and should be adopted by the DRECP. Additional pumping from basins already in overdraft, or where new pumping would threaten an overdraft (that is taking more water from a basin than is replaced by recharge, plus what is needed to avoid long term ecological impacts), should not be permissible.

Moreover, BLM's approach to basin hydrologic uncertainty where multiple plants are proposed and other uses are in place or likely is a rational one, although the agency needs a systematic way to allocate and impose costs on pumpers seeking agency approvals. For development focus areas, and prior to approving siting, the DRECP should require the collection of adequate hydrologic knowledge and production of a reliable groundwater model. If individual project applicants

[11] Perennial yield is the amount of water than can be withdrawn from a basin over a long term without creating overdraft conditions (that is, withdrawal and recharge are about equal, and water levels are not steadily dropping). Safe yield should be, but usually is not, interpreted as the amount of water that can safely, legally and economically be annually withdrawn from a basin without creating undesirable conditions, including impacts on biological resources. While safe yield thus defined is always less than perennial yield, it is often interpreted to be the same as perennial yield. Accordingly, to avoid confusion and clearly protect surface discharges and groundwater levels needed to support water dependent ecological resources we believe another term, ***sustainable yield***, should be used, and should be the limiting factor for cumulative groundwater withdrawals in a basin.

[12] See, Godfrey, Ludwig, et al., *Groundwater and Large-Scale Renewable Energy Projects on Federal Land: Chuckwalla Valley Groundwater Basin*; Arizona Hydrological Society 2012 Annual Water Symposium. Godfrey and Ludwig are BLM hydrologists. Abstract link: http://azhydrosoc.org/2012Symposium/docs/abstracts/1c_Godfrey_et%20al.pdf

cannot or will not conduct or finance that work, the agencies could underwrite the cost and allocate appropriate fractions of the costs to developers.

In the case of projects proposed for sites outside development focus areas (e.g. BLM's variance areas), individual project applicants should be required to bear the entire cost of acquiring the necessary information prior to project approval.

### *V. Recommendations for the Path Forward in the DRECP*

The Natural Community Conservation Planning (NCCP) Act of 2003 requires that an NCCP provide for the protection of habitat, natural communities and species diversity on a landscape or ecosystem level. In order to achieve these protections in the California deserts, the DRECP must adequately protect groundwater dependent ecological resources. We recommend that the DRECP adopt clearly specified and reasonably uniform requirements for baseline hydrology information, groundwater monitoring, modeling and mitigation. We believe that the DRECP is the appropriate place to define, extend and solidify rules to protect groundwater and groundwater dependent ecological resources in the planning area. These are the most important provisions that we believe that the DRECP should adopt related to solar development:

1. **Minimize Water Use,** especially for groundwater. Water use can be minimized through selection of power production and associated technologies and operational protocols. As an example, use of dry cooling for concentrating solar generation facilities (or photovoltaic generation) should be emphasized and incentivized over wet cooling technologies. In addition, long-term operations protocols that minimize on-going water use for cleaning, dust control, and all other plant uses should be incorporated in solar development plans and permits. Where the infrastructure already exists, renewable water sources from outside of the basin should be considered as a water source for developments. While many desert valleys are isolated and wholly reliant on local water supplies, in some cases water sources from outside the basin, such as Colorado River water, California State Water Project Water, or desalination water may be accessible, and use of these outside resources may provide immediate and long term benefits.

2. **Maintain Sustainable Yield.**[13] Groundwater withdrawals from desert basins should be limited in the DRECP to no more than the sustainable yield, considering cumulatively all legitimate existing and future uses and ecological needs. In no case should additional groundwater withdrawals be permitted from basins in overdraft. If information is inadequate to determine a basin water balance and sustainable yield, final approvals should not be issued until reliable information is obtained or should contain conservative monitoring conditions that assure sustainable yield will not be exceeded.

3. **Identify and Protect All Groundwater Dependent Resources.** The DRECP should use the best available science to identify and protect all groundwater dependent resources in the planning area, including streams, springs, seeps, wetlands, and the ecological communities and plant and animals dependent on surface water, irrespective of whether these are listed, covered or special status species. Protection may well require additional investigations and the designation of solar avoidance or new conservation designation areas.

4. **Improve Knowledge of Desert Basin Hydrology.** The DRECP should provide for systematic collection of adequate, objective information about the hydrology of each desert basin for which development is proposed, and, if agency resources are used to fund acquisition of the requisite information and studies, create a system to allocate the costs of acquiring that knowledge among developers.

5. **Require Predictive Monitoring, Modeling, Triggers and Compensation.** In all project approvals, the DRECP should require predictive monitoring and modeling designed to protect ecological resources against the long term risk of harm. Approvals should require enforceable triggers---pumping reduction or cessation – if harm is predicted to occur according to specified criteria, and provide for compensatory mitigation for all groundwater use. It is important to base monitoring and triggers around hydrologic values (i.e., specified declines in monitoring well water levels, which, once exceeded, place

[13] "Safe yield" can depict the necessary standard, but **only** if is clearly defined to include not only withdrawals that are no greater than recharge, but, more importantly, the protection of all discharges that support streams, springs, wetlands and groundwater dependent ecosystems. The regulatory interpretation of safe yield has, in the past, often not protected ecological uses, so we prefer the term "sustainable yield."

the burden of proof on the pumper to demonstrate that its withdrawals are not the cause of the declines) and not on detecting harm to vegetation or other ecological features, which are hard to measure, and may frequently be seen too late to remedy.

6. **Regulatory Authority.** The DRECP should make clear the statutory and regulatory provisions that govern the regulation of groundwater by state and federal agencies and justifying DRECP jurisdiction over groundwater against claims that the Plan should not consider groundwater protection. The Plan should also include cross-border effects in the Amargosa region.

# Appendix A: The Nature Conservancy's Databases

The Nature Conservancy has prepared two extensive databases, collecting and assessing available data on groundwater dependent ecosystems and freshwater biodiversity resources in California. We offer them for incorporation in the DRECP. While they supply essential information that the DRECP process can use to provide protection to groundwater and dependent resources, we note that they do not provide a complete picture of the relationship of desert groundwater and hydrology to ecological resources.

## 1. Groundwater Dependent Ecosystems in California – Report and Database

**Description:** The Nature Conservancy's *Mapping Groundwater Dependent Ecosystems in California*[14] report aims to illuminate the connection between groundwater and surface ecosystems by identifying and mapping the distribution of groundwater dependent ecosystems in California. Most groundwater conservation and management efforts focus on protecting groundwater for drinking water and for other human uses with little understanding or focus on the ecosystems that depend on groundwater. However, groundwater plays an integral role in sustaining certain types of aquatic, terrestrial and coastal ecosystems, and their associated landscapes. An index of groundwater dependency was developed by mapping and ranking three ecosystem types – springs, wetlands and streams as follows:

1) **Seeps and springs.** Seeps and springs were extracted from the National Hydrography Dataset (NHD) Plus database and assigned to each HUC12 (USGS defined watershed boundary) unit. Springs are mapped as point features in the NHD Plus dataset and therefore do not contain areal extent. To avoid scoring larger HUC12 units with higher scores (since it is likely that larger units would contain more springs), spring density was calculated as the number of springs and seeps per hectare. The raw density values were categorically scored (from 0–4) for each HUC12 using distribution quartiles. Note that a score of 0 means that there were no springs in the HUC12 unit.

[14] Howard J, Merrifield M (2010) Mapping Groundwater Dependent Ecosystems in California. PLoS ONE 5(6): e11249. doi:10.1371/journal.pone.0011249

2) **Groundwater dependent wetlands and associated vegetation alliances.** Groundwater dependent wetlands and vegetation were mapped using a composite layer compiled from various sources including CalVeg, the National Land Cover Database, and the National Wetlands Inventory. To limit wetlands and vegetation to those that rely on groundwater, we intersected the composite layer with hydric or partially hydric soils (from NRCS STATSGO2). Because groundwater dependent wetlands are defined by hydric or partially hydric soils, this step provided a filter by which surface water dependent wetlands and vegetation alliances were removed from the database. Resultant polygons of groundwater dependent wetlands were assigned to HUC12 units; density was calculated as area of groundwater dependent wetlands per hectare. Density values were then categorically scored (from 0–4) for each HUC12. Note that a score of 0 means that there were no groundwater dependent wetlands in the HUC12 unit.

3) **Groundwater dependent streams.** We used the NHD 24,000- scale data set for all of California and assigned baseflow to stream segments based on U.S. Geological Survey data (Wolock 2003). Baseflow is the component of the streamflow that can be attributed to groundwater discharge into streams. We assigned a baseflow index (BFI) (defined as the ratio of baseflow to total flow in a stream) to each HUC12 in the study area. All HUC12 units were assigned the best estimate of baseflow for streams within the HUC boundaries and thus dependency on groundwater. Raw BFI values were categorically scored using distribution quartiles.

## 2. Below the Surface: California's Freshwater Biodiversity – Report and Database

**Description:** The Nature Conservancy's *Below the Surface: California's Freshwater Biodiversity*[15] provides an overview of the California Freshwater Species Database. The comprehensive database identifies and maps freshwater vertebrates, invertebrates, and plant species in the state, and provides spatial data for those most in need of conservation action. The California Freshwater Species Database defines and lists freshwater species in the state, and provides the best available information as to where those species are located. This is the

[15] Howard, Jeanette, Kirk Klausmeyer, and Kurt Fesenmyer. 2013. *Below the Surface: California's Freshwater Biodiversity*.The Nature Conservancy of California. San Francisco, CA. 20 pp.

first database to compile range, historical and current distribution of freshwater species (both native and non-native) throughout California. The database will continue to evolve as knowledge of the location of freshwater species improves.

Key elements of the database are:

- **Species table**: Basic information about the 1,728 freshwater species in the study area including scientific name, common name, rarity, and conservation status.
- **Observational data**: Spatially explicit information on the known locations of 878 native freshwater species. We focused our spatial data collection effort on 976 freshwater species that are in most need of conservation effort because they are considered vulnerable and/ or endemic. Despite our extensive search, we were unable to find spatially explicit data for 98 vulnerable freshwater species (primarily insects and mollusks). In all, we compiled 241,500 spatial point, line, and polygon records from 141 unique data sources.
- **Observational data types**: For each record, we cataloged the available information about the data source, the specificity and nature of the observation (e.g., a general range map or a GPS coordinate of an observation), the habitat usage (e.g., spawning habitat, dispersal habitat), and the date of the observation (e.g., before or after 1980).
- **Watershed summaries**: We summarized all of the observational data by the 4,800 HUC12 watershed units in the study area to improve analysis and visualization.

**Links:** Summary Report and Comprehensive Spatial Database.

# Appendix B: The Nature Conservancy, *Principles for Responsible Water Use by Solar Energy Facilities in the Southwestern Deserts of the U.S.*

# Principles for Responsible Water Use by Solar Energy Facilities in the Southwestern Deserts of the U.S.

## Introduction

Large-scale solar development is an important component of a comprehensive renewable energy portfolio for the United States, and The Nature Conservancy encourages responsible siting of solar energy facilities. We work with natural resource agencies, energy developers and communities to ensure that solar development in the Mojave, Great Basin, and Sonoran deserts contributes to a more balanced energy portfolio, while preserving the unique ecological resources of our desert landscapes and ecosystems.

Industrial scale solar facilities can require significant amounts of water for cooling, cleaning mirrors, generating steam, and plant operations. Water use—especially pumped groundwater –in the desert can adversely affect ecological resources.. Yet, there is an absence of clearly articulated, scientifically robust agency guidelines for water resource management and protection in the desert.

Impacts to the relatively few, usually small, riparian or wetland areas where water is present at the surface can have far-reaching implications for ecosystems and species, exacerbated by the effects of climate change.

Even small increases in water use can cause dramatic changes in water conditions, including critical reductions in spring flows, stream flows, wetland areas and groundwater levels; these losses, in turn, can devastate ecosystems that depend on the water. Because of the very low precipitation inputs, and correspondingly low flow-through rates in desert groundwater systems, impacts of groundwater pumping become evident very slowly and can persist for extremely long periods of time.

Given the importance of water to natural ecological systems in the desert, and the prospect of significant new demand for water by new solar facilities, it is critically important to establish standards and guidelines to prevent unacceptable impacts to local ecosystems.

We propose that the solar industry voluntarily adopt the following standards as best management practices and mitigation requirements. Individual facility measures should be formulated and adopted as permit requirements through applicable federal (NEPA) and state (CEQA) environmental review processes.

## Establish the Physical and Biological Context

**Inventory Water-focused Ecosystems and Water Conditions that Support Them** – Identify natural features where surface waters exist, including areas where near-surface groundwater conditions

support unique habitats. Conduct a thorough inventory of natural water features in the basin, including springs, streams (ephemeral and perennial), areas of high groundwater levels and the ecosystems that depend on these resources. This inventory should include: 1) a characterization of the water-supported habitat and the species that are known to reside in or otherwise depend upon the habitats; and 2) a characterization of the water conditions that support the habitat.

**Understand Basin Water Balance** – Prepare a comprehensive basin water balance for the relevant flow system using best available information to estimate inflows, outflows, developed use, and relative magnitude of new or planned water development. A basic understanding of the water balance for a given desert valley or watershed is essential to evaluating the reasonableness of each proposed development site. The appropriate flow system boundaries for defining the "basin" of interest must be established for each solar development site, and the rationale for that flow system definition should be developed using the best available information. In some cases, the flow system of relevance may be a single, isolated valley-fill groundwater basin, and in other cases the flow system may include downstream or adjacent valleys that receive, or may receive water, via surface or subsurface flows from the valley where the project is located. Cases of interbasin hydrologic connectivity via permeable bedrock aquifers are well documented in the region, and the possibility of this type of hydrologic connectivity should be explicitly considered. If an evaluation of the water balance defining "sustainable yield" already exists, it should be updated to reflect the most recent precipitation and water use data and new understanding of geology.

**Consider Cumulative Impacts of Multiple Projects** – Base all water resource evaluations on assumptions that consider the potential cumulative impacts of all current and reasonably likely future development in a basin, including non-energy water uses.

**Conduct Groundwater Modeling** – Require groundwater modeling to anticipate and avert impacts that would otherwise not be noticed until after it is too late to take corrective action. In many desert settings, the impacts of groundwater pumping may become evident over very long periods of time. In this case, reliance only on monitoring to identify impacts would mean permanent loss of natural communities. Therefore, modeling must be included in each development approval to anticipate the range of responses that may be expected over long periods of time, and to shape water use and monitoring strategies that ensure water resource sustainability in the basin, For each basin in which development is planned, a groundwater model should be built using the best available information, and simulations should be conducted to better understand the long-term (100-year range) response to the different development scenarios.

**Resolving Uncertainty** – In some instances, key information or parameters needed to understand and model the effects of groundwater pumping may be missing. Until adequate information is available, conservative (reasonable worst case) assumptions should be used to bound water withdrawal and use approvals. In all cases, collection and analysis of additional critical data and information during project life should be required. Where new information predicts significant adverse effects, conditions of water use should be appropriately modified.

## Project Design

**Minimize Project Water Use** – Minimize water use through selection of power production and associated technologies and operational protocols. As an example, use of dry cooling for concentrating solar generation facilities (or photovoltaic generation) should be emphasized and incentivized over wet cooling technologies. In addition, long-term operations protocols that minimize on-going water use for cleaning, dust control, and all other plant uses should be incorporated in solar development plans and permits.

**Reduce Third-Party Water Use** – Where there is already some level of developed water use in the basin, development permits should require a net reduction in total basin water use, unless a credible analysis demonstrates that additional water development can be accommodated in the basin without any negative environmental or water supply sustainability impacts. Mechanisms for meeting this requirement may include: 1) acquiring existing water rights to supply the facility and retiring or reducing the previous use of the acquired water to accommodate the planned new use or 2) providing for reduction in current use to accommodate the new use without increasing the total water use.

**Access Other Renewable Water Sources** – Where the infrastructure already exists, renewable water sources from outside of the basin should be considered as a water source for developments. While many desert valleys are isolated and wholly reliant on local water supplies, in some cases water sources from outside the basin, such as Colorado River water, California State Water Project Water, or desalination water may be accessible, and use of these outside resources may provide immediate and long term benefits. In these cases, an evaluation of the relative risks, costs and benefits of these renewable sources, as compared with using limited local water sources should be conducted. Where such an analysis indicates that use of renewable surface water supplies may be favorable and may avoid or reduce impacts from use of resident groundwater water supplies, preference should be given to use of renewable water sources.

**Use Optimal Withdrawal Sites** – Minimize impacts to natural water features by choosing the best withdrawal locations. In some cases, the specific location at which water is withdrawn from a source, whether surface water or groundwater, may be more or less detrimental to the ecosystems that depend on the water. Development plans should choose least harmful locations of water withdrawals, including groundwater withdrawals. In cases where new use will replace existing uses, the location of withdrawals should be moved if impacts can be reduced by such a relocation.

## Long Term Project Operations

**Conduct Appropriate Monitoring and Modeling** – Long-term operation of the solar site should include appropriate monitoring of the water conditions, guided by updated modeling. Monitoring should include local and regional groundwater levels and related surface water flows. An approved development plan should include sponsoring or participating in a comprehensive basin monitoring plan that is periodically updated with new information.

**Identify Triggers and Develop Contingency Plans** – Permits should require clearly articulated triggers that indicate when groundwater pumping is likely to cause an unacceptable drop in water levels or adverse water quality changes, and identify contingency plans and predictable and enforceable mitigation steps if those triggers are reached.

**Compensate for Groundwater Impacts** – Compensatory actions for groundwater impacts may be required to offset impacts at any point during the life of the project. Acquisition of ecologically valuable land with associated water rights is an available and preferred mode of compensation.

# Appendix C: California State Director James Kenna and Nevada State Director Amy Lueders to Mr. Mike Monasmith, July 16, 2012, *Comments on the Preliminary Staff Assessment of the BrightSource Hidden Hills Solar Energy Generating System*.

# United States Department of the Interior

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**Comments on the Preliminary Staff Assessment of the BrightSource Hidden Hills Solar Energy Generating System**

JUL 16 2012

California Energy Commission
DOCKETED
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TN # 66238
JUL 17 2012

***In Reference Reply to:***
2801 (LLNV930)

Mr. Mike Monasmith
Project Manager
Siting, Transmission and Environmental Protection (STEP) Division
California Energy Commission
1516 Ninth Street, MS-2000
Sacramento, California 95814

Dear Mr. Monasmith:

This letter transmits the water-related concerns of the California and Nevada offices of the Bureau of Land Management (BLM) resulting from our review of the California Energy Commission's (CEC's) Preliminary Staff Assessment (PSA) of the Hidden Hills Solar Electric Generating System (HHSEGS). Our comments are part of our on-going effort to minimize or mitigate for impacts to BLM water-dependent public trust resources in Nevada and California.

The Nevada BLM is analyzing an associated right-of-way (ROW) application for a transmission line and a gas pipeline in Nevada, together called the Hidden Valley Electric Transmission Line (HVETL) Project, that will provide grid connection and natural gas for the HHSEGS located on private land just over the California state border.

The BLM understands that HHSEGSs would require up to 140 acre-feet per year (afy) of water, pumped from the Pahrump Valley groundwater basin. As stated in an earlier letter, the BLM is concerned that pumping from this water source, combined with cumulative impacts of other pumping, may cause impacts to the Amargosa Wild and Scenic River (W&SR) located in California, and to the Stump Spring Area of Critical Environmental Concern (ACEC) located in Pahrump Valley, Nevada.

The following items are concerns raised by BLM staff during review of the CEC's PSA and the public hearing that occurred on June 14, 2012 in Pahrump, Nevada.

**Cumulative Effects:**
The cumulative effects analysis should take into account all proposed development within the groundwater basin, including potential agricultural pumping as discussed at the June 14 meeting. Staff at the Pahrump and Barstow Field Offices can provide lists of all pending proposals on BLM land within their respective districts.

**Biological Resources:**
Condition of certification BIO-23 would require the applicant to conduct vegetation monitoring within groundwater-dependent vegetation communities located east of the project, including those within the BLM Stump Spring ACEC. The dual purpose of such monitoring would be to determine changes to biological resources and to distinguish project effects from background effects or a regional drought. A statistically significant change in biological resources is defined as a "decline in vegetation health of any groundwater-dependent species of 20 percent or more as compared to baseline values and values from offsite reference plots" (page 4.2-234). While the BLM supports this measure, additional clarification is needed to define what is meant by a 20 percent decline in vegetation health.

**Soils and Surface Water:**
An assumption is made in Table 6 (page 4.10-12) of the PSA that there will be negligible soil disturbance throughout the heliostat fields. Soil disturbance is a direct result of the installation of solar cells or mirrors and, to date, all technologies require some level of disturbance. Ground disturbance can occur even in relatively level areas. See attached Figure 1, where the ground surface in ISEGS disturbed heliostat fields differs markedly in appearance compared to adjacent undisturbed areas.

The applicant proposes to use the western perimeter roadway as a berm that would impound water into a retention basin, flooding a portion of the heliostat field during a 100-year storm event (PSA Figure 7). As the PSA points out, during such a storm event this berm would be insufficient to prevent flow across the roadway. Neither the applicant's plan of development nor the PSA's proposed SOILS-5 condition of certification address the possibility that flow across the roadway may cause this berm to fail, nor do they address any potential impacts of the resulting offsite flooding and scour. In particular, SOILS-5 does not require the berm to be stabilized with riprap, gunnite, or similar material that would prevent piping around the 18-inch culvert that would be the sole drainage point. Armoring of key points in this berm will be necessary to minimize risk to offsite soil resources. Alternatively, the applicant may choose not to install a berm along the western perimeter and simply allow floodwaters to pass through the heliostat field unimpaired, although this may result in heliostats being damaged or washed away.

**Water Supply:**
The applicant has performed an on-site well pump test, which lasted 4.5 days. We fully support the PSA's pump test review (Appendix A), which questions the assumptions, procedures, and conclusions of the applicant's pump test report. We recommend that another pump test be performed, lasting at least one week. This new pump test, combined with curve fitting for determination of the rate of drawdown stabilization at the monitoring wells, would better determine whether there is a direct link between the alluvial aquifer and the underlying carbonate aquifer. This information would help estimate the degree to which pumping may affect water resources to the east and west of the project, as well as the timing of such impacts. To get the best estimation of key subsurface parameters and impacts, it would be important for at least two of the monitoring wells to penetrate the carbonate aquifer. As shown in Figure 4 of Section 4.15 in the PSA, there are locations close to the project area where the carbonate aquifer is at or near ground surface.

The lack of any physical logs for any onsite or nearby wells impedes the ability to draw clear conclusions as to aquifer parameters and the impact of pumping on the aquifer. If well logs are available, the applicant should utilize them to validate its conclusions regarding the impact of pumping on groundwater. At least some of the monitoring wells should be screened in the same stratigraphic interval as the pumping well. Actual physical data from well logs rather than assumed values for aquifer parameters is critical for analyzing pump test results, and for using these results to construct a conceptual model of local and regional groundwater flow and the impacts of the HHSEGS project on this flow. If any of the above data reveal that the initial pump test conclusions were incorrect, the water supply and mitigation plans may need to be revised.

The BLM supports implementation of condition of certification WATER SUPPLY-1, which would require the applicant to replace all extracted groundwater. This is similar to a mitigation measure being developed by California BLM in discussion with the developer of the Desert Harvest solar project in the Chuckwalla Valley, as well as future developers in that basin. Unlike the Desert Harvest mitigation, however, the PSA recommendation is to require BrightSource to simply replace the extracted water at some point during the 30-year life of the project. At least some of this replacement should be required to occur early in the life of the project. Reinforcing this need is the existence of large ground cracks approximately 4 miles north of the HHSEGS site, which appear to be subsidence cracks caused by groundwater extraction in the area (see attached Figure 2); these features suggest that the basin is already experiencing an irreparable loss of storativity by diminishing local groundwater aquifers.

The groundwater monitoring network suggested by the CEC will be more robust if the number of monitoring wells is increased. The hydrologists for the BLM's Southern Nevada District and California Desert District recommend a groundwater monitoring system that would differentiate project impacts from other impacts such as climate change and other groundwater pumping within the basin. Item A1 of condition of certification WATER-SUPPLY-8 would require a monitoring network of ten wells, but only three of these would be outside the project boundary. We recommend that additional wells be included in the monitoring network. East of the project site on Nevada BLM land, we suggest five additional monitoring wells to supplement the CEC-proposed wells. Specifically, the BLM suggests two additional wells directly up-gradient from Power Block 1 and two additional wells directly up-gradient from Power Block 2 to supplement CEC-identified BLM Mesquite Bosque Wells 1 and 2, respectively. These wells should be placed at regular intervals 0.5 to 1.5 miles from the project boundary. One additional well should be installed east of the Stump Spring ACEC so as to help differentiate any drawdown east of the ACEC, for example drawdown extending from the proposed BrightSource Sandy Valley SEGS project, from drawdown emanating from the HHSEGS site. If any drawdown is measured over time at the Mesquite Bosque Wells, monitoring wells placed in the configuration described above should provide adequate information to determine whether this drawdown is originating from the project site or is due to other factors identified above.

Condition of certification WATER-SUPPLY-8 recommends only one well to the west of the project, between 2 and 3 miles from the project boundary; this well would be on the far side of an inferred fault (Figure 13 of the PSA), which may delay drawdown at that well. The BLM recommends four additional wells; like the wells recommended above, these would be placed at

regular intervals up to two miles west of the project boundary. As stated above, it is imperative that the best estimates of the degree and timing of any potential impacts of the project on the Amargosa River be determined and mitigated for prior to approval of the project.

The BLM supports items C3 and C4 of WATER-SUPPLY-8, which would require the project owner to "substantially reduce, modify, or stop project pumping" if impacts are seen either at the eastern project boundary or at either of the BLM Mesquite Bosque Wells. However, these two items require pumping to cease only if the water table at the BLM Mesquite Bosque Wells drops 0.5 feet (that is, 0.5 feet below the level predicted by current trends) *and* plant vigor drops below the threshold set in BIO-23. We recommend a more rigorous and protective set of trigger requirements. First, we recommend that drawdown triggers also be determined for other wells closer to the project, the locations of which are discussed above. These trigger depths would be graduated based on the expected drawdown at these wells that would correlate to an 0.5-foot drawdown at the Mesquite Bosque Wells, based on results of the additional pump test and curve-fitting procedure discussed above. Second, we recommend that pumping be immediately curtailed or ceased if any of these drawdown triggers are crossed, regardless of whether impacts appear in the vegetation. By the time vegetation is noticeably affected, it may be too late for pumping curtailment to save these bosques.

The BLM appreciates having the opportunity to provide comments on the HHSEGS project. If you have any questions please contact Sarah Peterson, Nevada State Lead for Soil, Water, Air & Riparian programs at 775-861-6516; Dr. Boris Poff, District Hydrologist for the Southern Nevada District office at 702-515-5154; Peter Godfrey, Hydrologist, California Desert District, at 951-697-5385; or Dr. Noel Ludwig, Hydrologist, California Desert District, at 951-697-5368.

Sincerely,

James G. Kenna
California State Director

Amy Lueders
Nevada State Director

cc:
Mary Jo Rugwell, District Manager, Southern Nevada District Office
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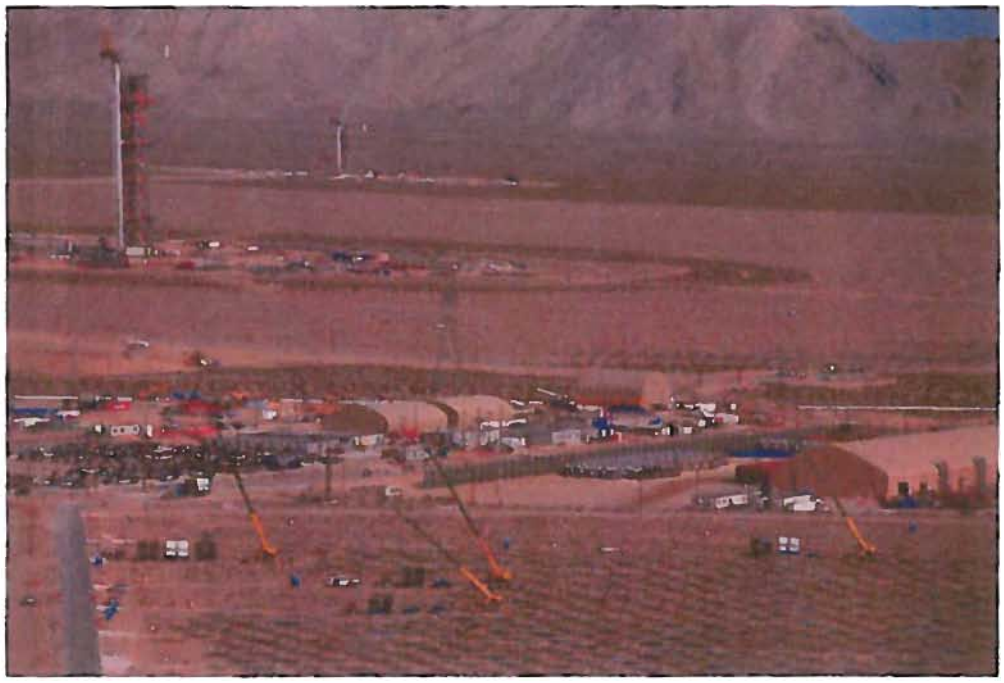

*The view of the entire project as seen from the top of the Unit #1 tower, with Unit #2 (left) and Unit #3 (center) in the distance.*

Figure 1. Oblique view of Ivanpah Solar Energy Generating System construction, showing disturbance within heliostat fields.

Figure 2. Large ground cracks located approximately 4 miles north of the HHSEGS site.

# Appendix D: Nevada State Director Amy Lueders and California State Director James Kenna to Mr. Mike Monasmith, March 12, 2013, Correspondence related to review of the California Energy Commission's (CEC) Final Staff Assessment and the applicant response to the assessment for the Hidden Hills Solar Electric Generating System (HHSEGS).

# United States Department of the Interior

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California Energy Commission
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In Reply Refer To:
2801 (LLNV930)

Mr. Mike Monasmith
Project Manager
Siting, Transmission and Environmental Protection (STEP) Division
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1516 Ninth Street, MS-2000
Sacramento, CA 95814

Dear Mr. Monasmith:

This letter transmits the water-related concerns of the California and Nevada offices, as well as the cultural resources concerns of the Nevada office of the Bureau of Land Management (BLM) resulting from our review of the California Energy Commission's (CEC) Final Staff Assessment and the applicant response to the assessment for the Hidden Hills Solar Electric Generating System (HHSEGS). Our comments are part of the BLM's ongoing effort to minimize or mitigate for impacts to BLM water-dependent public trust and cultural resources in Nevada and California and want the commissioners to take the information into consideration during the hearings and decision making process for permit authorization.

The BLM-Nevada is analyzing an associated right-of-way (ROW) application for a transmission line and a gas pipeline in Nevada, together called the Hidden Valley Electric Transmission Line (HVETL) Project. The HVETL Project will provide grid connection and natural gas for the HHSEGS located in California on private land along the Nevada state border.

The BLM understands that HHSEGS would require up to 140 acre-feet per year (afy) of water, pumped from the Pahrump Valley groundwater basin. As stated in our earlier two letters, the BLM is concerned that pumping from this water source, combined with the cumulative impacts of other groundwater pumping, will cause impacts to the Amargosa Wild and Scenic River (W&SR) located in Inyo County California, and to the Stump Spring Area of Critical Environmental Concern (ACEC) located in the Pahrump Valley Nevada.

The BLM continues to have concerns that activities resulting from the development of the HHSEGS will cause impacts to resources on public lands managed by the BLM. Hence, both the California Desert District and the Southern Nevada District of the BLM requests to be notified on a regular basis of any results from groundwater monitoring conducted by the operators of the HHSEGS, or their consultants. The BLM also requests to be consulted by the CEC's Compliance Project Manager on the interpretation of the monitoring results, performance standards as

outlined in Water Supply-4 and Bio-23, and to participate in identifying mitigation measures used to off-set impacts as defined by Water Supply-4.

Further, the BLM recommends the CEC clarify one of the mitigation options under Water Supply-4, namely the retirement (or off-set) of water rights. To have any impact as a mitigation measure, water rights to be retired as an off-set for active pumping by HHSEGS must be senior water rights that are currently (within the past five years) and actively being put to beneficial use, are consumptive in nature, and located near the project area. Three of these stipulations (senior, consumptive, and actively being put to beneficial use) are well defined by the Nevada State Engineer, who manages all water rights in Nevada. There are approximately 40,000 afy of inactive water rights in the Pahrump Valley the retirement of any of these will have no effect in mitigating impacts caused by the HHSEGS. Since water rights in the Pahrump Basin are over-appropriated by a ratio of approximately 3:1 (appropriated water rights: groundwater recharge) it is advisable to retire active senior, consumptive water rights at the same ratio to maximize the benefits of retiring water rights as a mitigation option.

Stump Spring, which is located in Clark County, Nevada, is believed to receive its water from more than one source, including snowmelt in the Spring Mountains, rather than solely from local precipitation events. This is based on both geochemical and water-level analysis of the Stump Spring monitoring well. The water-level data in the well shows an increase in water-level after the notably above average snow year of 2005 followed by a gradual drop in water levels overtime since, despite the precipitation pattern in the following years. Geochemical analysis performed by the United States Geological Survey (USGS) on the Stump Spring monitoring well indicates that 'water derived from Stump Spring Well is either derived from an entirely different source than the Spring Mountains recharge or contains an additional source component to Spring Mountains recharge' (Leigh Justet, personal communication, 1/24/2012). Surface water at Stump Spring, which is an intermittent water source, tends to be as little as one to three inches above ground surface for approximately two to three months out of the year. Therefore, even a drop of two inches in water levels could mean that surface water that was typically available for wildlife use may not be available at all and could result in impairment to the BLM's water rights on Stump spring.

Additionally, the BLM has concerns regarding the Mesquite bosques in Pahrump Valley, which are located in both Clark and Nye Counties. While mesquite trees often have roots that are deeper than 35 feet, it is difficult for new tree recruitment to occur when water levels are declining. There are only a few places where mesquite tree recruitment has been documented recently in the Pahrump Valley. With the locally dropping water levels, current Mesquite population become relic populations that are not sustainable and will eventually die off. This is one reason the BLM Southern Nevada District Office is analyzing expanding the existing Stump Spring ACEC and/or forming a new Mesquite ACEC in the revision of the current Resources Management Plan.

The lack of empirical data does not allow the BLM or others for that matter to determine the exact impacts the HHSEGS groundwater pumping will have on resources managed by the BLM, therefore, the BLM requests the mitigation of all reasonably and foreseeable impacts thereof. Ideally, BLM would require more in-depth scientific studies to gather data to determine impacts

and determine what triggers, if any, would be advisable. However, due to the absence of this information, the BLM advocates the triggers suggested by the CEC in the Final Staff Assessment (1-foot drop in groundwater levels at on-site HHSEGS monitoring wells or 6-inch drop in groundwater levels at the HHSEGS monitoring wells on BLM-managed land). Given the location of all of the suggested monitoring wells for this project as well as the potential use of other monitoring wells the project area, it is feasible to determine whether drops in groundwater levels are caused by the HHSEGS or other factors.

The BLM also advises the CEC to clarify adaptive management language regarding the Amargosa W&SR. Since Congress designated this section of W&SR, the BLM is mandated by law to manage for the established Outstandingly Remarkable Values (ORVs) in perpetuity. To support this, better understanding of groundwater flow paths in the area of the W&SR are needed and BLM is collaborating in several ongoing scientific studies and efforts. Stakeholders in this work include the BLM, the USGS, the US Fish and Wildlife Service, the Amargosa Conservancy, Nye County Nevada, and Inyo County California. With that in mind, Water Supply – 8 should include the potential for mitigation action if HHSEGS groundwater production is ever demonstrated to have an impact on base flow into the Amargosa River. While there continues to be uncertainty regarding such impacts, should they occur, even at some distant time in the future, those impacts could be catastrophic to this congressionally designated W&SR and those resources dependent upon its waters.

Regarding cultural resources, compliance with Section 106 of the National Historic Preservation Act (NHPA) and the Statewide Protocol Agreements between the BLM and the California and Nevada State Historic Preservation Officers (SHPO) requires the EIS to consider impacts to significant properties on both the public and private land portions of the project. The HHSEGS facility proposed on private land in California, as well as the transmission line and pipeline proposed on BLM-managed lands in Nevada would be constructed within the view shed of the Old Spanish National Historic Trail (OSNHT). This includes one segment of the OSNHT (Stump Springs) that is listed on the National Register of Historic Places. The BLM is aware of the inventory efforts completed to date, and the discussion of National Historic Trail resources and potential impacts to the OSNHT contained in the Final Staff Assessment. However, the BLM must follow federal law and policy related to determining impacts from the HHSEGS Project on the OSNHT, particularly the NHPA, National Trails System Act, and BLM Policy Manual 6280. In order to do this, the BLM Nevada State Office National Historic Trails Lead is planning to meet with our Southern Nevada District Office and the Nevada SHPO in April to establish the Area of Potential Effect (APE). This APE will be the area analyzed in the EIS to determine the extent of impacts to the resources, qualities, values, and associated settings of the OSNHT from each alternative to be analyzed. Because the APE has not yet been established, the BLM has not yet made a determination, in consultation with SHPO, of the adequacy of previous cultural resource inventories and the potential need of additional inventories. Once this occurs, and all the data have been inventoried and reported, BLM, in consultation with the SHPO and the Advisory Council on Historic Preservation (letter to BLM dated February 8, 2013, stating their intent to consult with BLM on this undertaking), will determine impacts to the OSNHT, as well as measures to be undertaken to take into account adverse effects.

The BLM appreciates having the opportunity to provide comments on the HHSEGS project. If you have any questions please contact Sarah Peterson, Nevada State Lead for Soil, Water, Air & Riparian programs at 775-861-6516; Dr. Boris Poff, District Hydrologist for the Southern Nevada District office at 702-515-5154; Peter Godfrey, Hydrologist, California Desert District, at 951-697-5385; Dr. Noel Ludwig, Hydrologist, California Desert District, at 951-697-5368; or Bryan Hockett, BLM Nevada State Lead for National Historic Trails, at 775-861-6546.

Amy Lueders, State Director, Nevada

James Kenna, State Director, California

ecc:
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