

**Palen Solar Photovoltaic Project  
Informational Update Related to the Future  
Draft Supplemental EIR/EIS**

# **Alternatives Overview**



Prepared by:

Department of the Interior, Bureau of Land Management,  
Palm Springs-South Coast Field Office

County of Riverside

February 2017

## Contents

<b>1. Introduction.....</b>	<b>1</b>
<b>2. Alternatives Evaluated .....</b>	<b>2</b>
<i>Proposed Action.....</i>	<i>2</i>
<i>Alternative 1: Reduced Footprint Alternative .....</i>	<i>3</i>
<i>Alternative 2: Avoidance Alternative.....</i>	<i>3</i>
<i>No Action Alternative/No Project Alternative .....</i>	<i>4</i>
<b>3. Alternatives Considered but Not Analyzed in Detail .....</b>	<b>5</b>
<i>Solar Trough Technology .....</i>	<i>5</i>
<i>Solar Power Tower Technology .....</i>	<i>6</i>
<i>PSPP Alternative Sites.....</i>	<i>6</i>
<i>PSPP Alternative Solar Technologies .....</i>	<i>6</i>
<i>Alternative Renewable Energy Technologies .....</i>	<i>7</i>
<i>Alternative Methods of Generating Electricity.....</i>	<i>7</i>
<i>Conservation and Demand-Side Management .....</i>	<i>7</i>
<i>PSEGS Alternative Power Tower Heights.....</i>	<i>7</i>
<i>PSEGS Alternative Number of Power Towers.....</i>	<i>7</i>

### Figures:

- Figure 1: Proposed Action
- Figure 2: Proposed Action Project Area Detail
- Figure 3: Reduced Footprint Alternative
- Figure 4: Avoidance Alternative

# **Palen Solar Photovoltaic Project Supplemental EIS/EIS**

## **Alternatives Overview**

### **1. Introduction**

This informational overview is being provided to update and inform the public as to BLM's progress and ongoing actions related to consideration of a solar energy generating facility in the Riverside East Solar Energy Zone near Desert Center, California. This document is not a part of the planned Supplemental EIS/EIR. Its issuance is not required by either CEQA or NEPA, and thus there are no applicable substantive or procedural requirements for its content or review.

The original Palen ROW application was submitted in 2007 by Palen Solar I, LLC (PSI), a wholly owned subsidiary of Solar Millennium, as a solar trough project called the Palen Solar Power Project (PSPP). In 2012, the application was transferred from PSI to Palen Solar III, LLC (PSIII) and BrightSource Energy, Inc. PSIII submitted a ROW application amendment to the BLM for the Palen Solar Electricity Generating System Project (PSEGS), a 500 MW concentrating solar power tower technology facility and single-circuit 230 kV gen-tie line. In December 2015, the ROW application was transferred to EDF Renewable Energy (EDF RE). EDF RE is seeking to amend the pending Right-of-Way (ROW) application CACA- 048810 from a 500 megawatt (MW) solar power tower technology to an up to 500 MW solar photovoltaic (PV) panel technology – the Palen Solar Photovoltaic Project (PV Project).

BLM will be responding to EDF RE's ROW amendment application submitted to construct, operate, maintain, and decommission a solar photovoltaic energy-generating facility and associated infrastructure on public lands administered by the BLM in compliance with FLPMA, BLM right-of-way regulations, and other applicable Federal laws and policies. BLM's response will include consideration of an amendment of the California Desert Conservation Area (CDCA) Plan of 1980, as amended. Before BLM can act on this ROW application and amendment to the CDCA, as amended, it is necessary to comply with NEPA. Additionally, EDF RE has also entered into a water supply contract with the County. The contract would authorize the purchase of construction water from wells operated by the Riverside County Service Area (CSA). The County's discretionary action requires CEQA compliance.

A supplemental EIS/EIR is being prepared by the Bureau of Land Management (BLM) as the lead agency under the National Environmental Policy Act (NEPA) and the County of Riverside (County) as the lead agency under the California Environmental Policy Act (CEQA). This Alternatives Overview document provides the public with information on preliminary alternatives prior to the release of Draft Supplemental EIS/EIR. These draft alternatives are intended to be the bases for which the BLM and the County will assess the environmental impacts of the Palen Solar PV Project (the Proposed Action, or Project), proposed by EDF. The BLM and the County may further refine these alternatives prior to the release of the Draft Supplemental EIS/EIR later this year.

**Summary of Alternatives.** As mentioned above, two prior iterations of the solar project were proposed at the Palen site: the PSPP with solar trough technology and the PSEGS with solar power tower technology. The NEPA/CEQA documents for these projects each included a range of alternatives, some fully analyzed and some eliminated from detailed analysis. In preparing the Supplemental EIS/EIR for the Palen Solar PV Project, each of these previous alternatives was considered for analysis. The Lead Agencies determined that the Proposed Action, No Action/No Project Alternative, and two configuration alternatives would be retained for analysis in the SEIR/EIS.

Section 2 of this Alternatives Overview contains a preliminary description of the alternatives being considered for evaluation in the Supplemental EIS/EIR. Section 3 describes the alternatives eliminated from detailed analysis.

## **2. Alternatives Evaluated**

The alternatives described in this overview are those planned for evaluation in the Draft Supplemental EIS/EIR. The alternatives are illustrated on maps at the end of this document.

- Proposed Action (Figure 1, Figure 2): a 500 MW photovoltaic array on approximately 4,200 acres, reduced grading, avoids portions of the sand transport corridor.
- Alternative 1, Reduced Footprint (Figure 3): a 500 MW photovoltaic array on approximately 3,100 acres. Avoids the central and largest desert wash and includes a more efficient use of land (6.2 acres per MW). Extends further than the Proposed Action into the sand transport corridor.
- Alternative 2, Avoidance Alternative (Figure 4): up to a 230 MW photovoltaic array on approximately 1,620 acres. Avoids washes and riparian habitat, Mojave fringe-toed lizard habitat, and sand transport corridor.
- No Action/No Project Alternative: no generation, no associated ground disturbance, and no benefits due to greenhouse gas reduction from displacing carbon-fueled power plants.

### **Proposed Action**

The Proposed Action is for a 500 MW solar photovoltaic energy-generating facility and associated infrastructure on public lands. The project would be expected to produce approximately 1.6 million megawatt-hours per year (megawatt-hours per year is a measure of the system's energy, which is the amount of power generated by the system during a year). The Project would be located in Riverside County, 10 miles east of Desert Center on federal public lands administered by the BLM, Palm Springs-South Coast Field Office - see Figure 1 (all figures are presented at the end of the text). The project site is within the Riverside East Solar Energy Zone (SEZ) of the BLM's Western Solar Plan and within a Development Focus Area (DFA) of the Desert Renewable Energy Conservation Plan (DRECP). The Project would be located on approximately 4,200 acres.

The original solar project application, and prior EIS publications, preceded BLM's DRECP plan amendment to the CDCA. As such, a CDCA Plan Amendment to designate the project area as being suitable and available for large-scale solar energy development remains part of the proposed action.

The proposed solar facility would consist of the following major components, as shown on Figure 2:

- One large solar field with two smaller adjacent solar fields for a total of 3 fields;
- An electrical substation;
- An operations and maintenance building at the laydown area;
- Up to 10 on-site groundwater wells (exact locations not yet determined);
- One temporary 28-acre construction laydown area;
- A roadway system consisting of internal and perimeter roads;
- A main access road from the Interstate 10 (I-10)/Corn Springs interchange;
- A 6.9-mile double-circuit 230 kV gen-tie extending from the project substation to the existing Southern California Edison (SCE) Red Bluff Substation (see Figure 1); and
- An access road along the gen-tie line (see Figure 1).

Much of the solar field would be impacted by some form of ground disturbance, either from compaction, micro-grading, or disc-and-roll grading. Cutting and removing vegetation, where required, would disturb the soil to several inches but potentially allow some roots to remain to assist in soil stabilization and reduce the possibility of erosion.

EDF RE proposes to use site preparation techniques that would minimize the required volume of earth movement, including a “disc and roll” technique that uses grading equipment to till the soil over much of the solar facility site and then roll it level, as well as “micro-grading” or “isolated cut and fill and roll” of other areas of the site to trim off high spots and use the material to fill in low spots.

### **Alternative 1: Reduced Footprint Alternative**

EDF RE designed the Reduced Footprint Alternative in response to a BLM request that they develop a layout that would avoid direct impacts to the large microphyll woodland and primary desert wash that crosses the center of the Palen Solar PV Project site. The Reduced Footprint Alternative would be constructed within the same project boundaries as the Proposed Action but it would eliminate use of the central desert wash that crosses the project site from southwest to northeast, as illustrated in Figure 3.

The Reduced Footprint Alternative would be a 500 MW project like the Proposed Action, but its permanent disturbance would cover 3,100 acres (compared with 4,200 acres for the Proposed Action). The alternative would divide the Project’s solar arrays into two separate fields (separated by a gap of from 1,750 to 2,300 feet in width) with each field separately fenced. The western field would be extended north, compared with the Proposed Action. The eastern field would be reconfigured to eliminate its original northeastern third, and would be shifted to the south.

### **Alternative 2: Avoidance Alternative**

On September 14, 2016, the BLM signed the Record of Decision approving the Desert Renewable Energy Conservation Plan Land Use Plan Amendment (DRECP LUPA). The DRECP LUPA is intended to provide for the development of renewable energy on BLM-administered lands while providing for the conservation of plant and wildlife communities. The Palen Solar PV Project is not subject to the DRECP LUPA, as the amendment expressly stated

that. the DRECP does not apply to “[a] project that is proposed in a BLM SEZ and that is considered a ‘pending project’ under the Solar Programmatic EIS Record of Decision (the project application was filed before June 30, 2009).” The initial Palen application was filed before June 30, 2009, the Project is located within a SEZ, and was considered a pending project under the Solar Programmatic EIS. Since 2009, the subsequent amendments to the the project either do not affect the project boundaries (i.e., they result from a change in project developer) or are related to avoiding resource or land use conflicts or adapting the Project to third-party-owned infrastructure constraints. Therefore, the Palen PV Project is being processed under the CDCA land use plan decisions in place prior to the adoption of the DRECP LUPA.

Although the planning decisions in the DRECP LUPA do not apply to the Project, and the BLM is considering the project under the CDCA before it was amended by the DRECP LUPA, the Avoidance Alternative illustrates consideration of the mitigation and avoidance measures (called Conservation and Management Actions [CMAs] in the DRECP LUPA) in the application area.

This alternative would be constructed within the same boundary as the Proposed Action, but development would be limited to a much smaller area. The smaller area would reflect the resource avoidance measures defined in three CMAs: LUPA-BIO-RIPWET-1 (avoid riparian and wetland vegetation types), LUPA-BIO-DUNE-2 (avoid impacting the amount of sand entering or transported within the Aeolian sand transport corridor) and LUPA-BIO-DUNE-4 (avoid impacts to dune formations and other sand accumulations with suitable habitat characteristic for the Mojave fringe-toed lizard).

The resulting developable area for the Avoidance Alternative would be 1,620 acres (compared with 4,200 acres in the Proposed Action), as illustrated in Figure 4. The generating capacity would be up to 230 MW, compared with 500 MW in the Proposed Action and Alternative 1. Because the area available for development includes small, discontinuous polygons, it is uncertain how much of this area is developable.

In addition to the CMAs that would restrict the lands on which the Project could be built, there are additional DRECP LUPA CMAs that reflect other protections or compliance with existing policies and regulations. These include appropriate management of cactus, yucca and other succulents, compensation for certain species including mortality impacts to some bird and bat species based on monitoring, groundwater monitoring and mitigation, and regional mitigation for visual impacts.

## **No Action Alternative/No Project Alternative**

Under the NEPA No Action Alternative and the CEQA No Project Alternative, the ROW application CACA-48810 would be denied by BLM and the ROW grant would not be authorized, and the BLM would not amend the CDCA. The County would not act on the groundwater permit applications.

Any future applications would be subject to the CDCA as amended by the DRECP. The DRECP LUPA designated this area as a Development Focus Area, meaning that denial of this project would not necessarily foreclose the site to development in the future. Definition and analysis of the type of project that may ultimately be developed at this site cannot now be defined; however, the DRECP Final EIS provides a discussion of the impacts of various types of solar technologies



that may occur in DFAs. Any future project at this location would be subject to its own NEPA process (and CEQA, if applicable), and the requirements included in the DRECP LUPA would apply.

### **3. Alternatives Considered but Not Analyzed in Detail**

The alternatives currently in the category of considered but eliminated from detailed analysis include the following:

- Solar trough technology (as evaluated for the PSPP)
- Solar power tower technology (as evaluated for the PSEGS Project)
- Alternatives considered in the PSPP NEPA/CEQA documents:
  - Five alternative sites
  - Five alternative solar technologies
  - Five alternative renewable energy technologies
  - Alternative electricity generation technologies
  - Conservation and demand-side management
- Additional alternatives considered for the PSEGS NEPA/CEQA documents
  - Alternative power tower heights and elimination of one tower

These alternatives are summarized below.

#### **Solar Trough Technology**

The solar trough alternative is based on the PSPP Project, proposed in 2009 at the Palen site. It would use solar parabolic trough technology that consists of arrays of 30-foot-tall parabolic mirrors that would collect heat energy from the sun and refocus the radiation on a receiver tube located at the focal point of the parabola. Within the tube would be a HTF, which would be brought to a high temperature (750 degrees F), and then is piped through a series of heat exchangers where it would release the heat to generate high pressure steam. The steam would be fed into a steam turbine generator to produce electricity.

The disturbance area for the solar trough alternative necessary for a 500 MW-equivalent project would be 3,100 acres although the fenced areas would be just under 4,000 acres. Solar trough fields have stringent grading requirements as parabolic troughs must be almost level along their troughs, and grades perpendicular to the troughs are generally benched to 2 percent or less. Therefore, most of the site would have been graded and scraped free of vegetation.

The solar trough project would include engineered drainage channels along the project boundary wherever the detailed modeling indicated the potential for the interception of offsite surface flows exists. The channels would intercept offsite flows and convey them around and through the Project for discharge along the northern project boundary.

Construction would occur over 39 months with an average workforce of 566 employees and a peak workforce of 1,140 employees. Operational employment would be 134 employees.

## **Solar Power Tower Technology**

The solar power tower alternative is based on the PSEGS project, proposed in 2013 as a 500 MW solar power tower project at the Palen site. The solar fields would extend over 3,500 acres and each field would contain approximately 85,000 large mirrors called heliostats. In the center of each solar field there would be a 750-foot tall power tower, topped by a lightning rod approximately 10 feet tall and Federal Aviation Administration-required lighting.

In addition to the power towers, the two power blocks would include one steam turbine generator, and supporting auxiliary equipment including a dry cooling system, transformer, emergency diesel generators, and natural gas auxiliary boilers. Each power block would require a wastewater system with a 2-acre evaporation pond. The auxiliary boilers would require a natural gas fuel supply, which would be provided via a new 3,000-foot long pipeline in a 50-foot-wide right-of-way. PSEGS was proposed with a dry-cooling system that would include a 120-foot tall air-cooled condenser unit for each power tower structure.

The disturbance area for the Project would be almost 3,900 acres. The ground surface within the solar field would not be graded or disturbed except to construct the “spoke” roads from the power block to the outer edge of the solar field. PSEGS would maintain sheet flow. Vegetation in the solar field would be mowed to a height of 12 to 18 inches and be subject to invasive plant and weed management measures. Water would be sourced primarily from groundwater, from onsite wells.

The construction of the solar power towers would take 34 months. There would be an average of 998 daily construction workers with a peak of 2,300 daily workers. Operation would require up to 100 full-time employees.

## **PSPP Alternative Sites**

In the PSPP EIS, the BLM considered but rejected the following five alternative sites because they would not avoid or substantially reduce the adverse impacts of the PSPP, because they would not meet PSPP objectives or the BLM’s purpose and need for the Project, or otherwise were not reasonable alternatives due to their comparable or greater impacts.

- North of Desert Center Alternative
- Cibola Alternative
- Palen Pass Alternative
- Desert Center Alternative
- Palo Verde Mesa Alternative

## **PSPP Alternative Solar Technologies**

The PSPP analysis screened and rejected five alternative solar technologies from detailed analysis because they were considered infeasible in the context of the PSPP application:

- Stirling Dish Technology
- Solar Power Tower Technology
- Linear Fresnel Technology
- Utility scale Solar Photovoltaic Technology
- Distributed Solar Technology



## **Alternative Renewable Energy Technologies**

The following alternative renewable energy technologies were considered but rejected:

- Wind Energy Alternatives
- Geothermal Energy Alternatives
- Biomass Alternatives
- Tidal Technology Alternatives
- Wave Power Alternatives

## **Alternative Methods of Generating Electricity**

The following alternative methods of generating or conserving electricity were considered as potential alternatives:

- Natural gas
- Coal
- Nuclear energy

## **Conservation and Demand-Side Management**

Conservation and demand-side management were discussed, but eliminated from detailed discussion because it did not respond to the BLM's purpose and need for the PSPP PA/FEIS. It was also eliminated because it would be speculative to assume that there would be adequate conservation and demand-management alone to address all of California's energy needs. In addition, these solutions were considered to be beyond the Lead Agencies' or the applicants' control.

## **PSEGS Alternative Power Tower Heights**

A taller power tower alternative to the PSEGS Proposed Action would have resulted in fewer impacts on ground-based resources since it would require less land to generate the same amount of MW. However, it would be visible over a larger geographic area.

A shorter power tower alternative would have resulted in output inconsistent with the PSEGS objectives, but would have a smaller viewshed, contrast less with its surroundings, and ultimately impact a smaller number of sensitive receptors.

## **PSEGS Alternative Number of Power Towers**

The PSEGS proposal was to construct two power towers. A single tower design was considered, but not analyzed as a viable alternative to the PSEGS proposal, primarily because the economics and engineering for a single 500 MW tower was considered to be prohibitive, and a single 250 MW tower would not meet project objectives. Depending on the height being proposed for a single power tower alternative, it also might not result in reduced visual impacts from many viewpoints, as they would be generally impacted similarly by a single and double power tower design.

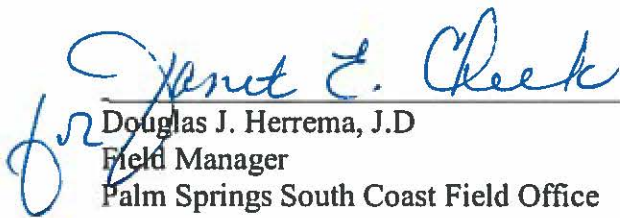
## **4. Next Steps**

BLM and Riverside County will continue to work on development of the Draft Supplemental EIS/EIR and Proposed CDCA Plan Amendments and release them for public review and comment later this year. Information about all opportunities for public involvement will be maintained on the BLM website at <https://eplanning.blm.gov>.

Although this document is being provided for informational purposes, members of the public may direct any questions or concerns to the BLM at the following addresses:

- Online, using the BLM ePlanning website at: <https://eplanning.blm.gov/>
- E-mail to [PalenSolar@blm.gov](mailto:PalenSolar@blm.gov)
- Palen Solar PV Project, c/o Aspen Environmental Group, 235 Montgomery Street, Suite 935, San Francisco, CA 94104

Any public input received on this document will be considered during preparation of the Draft Supplemental EIS/EIR and included in the BLM's administrative records, however the agencies may not respond to each comment individually or prepare a summary report of comments received. The opportunity for public comment on the Draft Supplemental EIS/EIR will not be affected by this publication.

  
Douglas J. Herrema, J.D.  
Field Manager  
Palm Springs South Coast Field Office