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3.19 Visual Resources

Section 3.19 of the PSPP PA/FEIS describes the PSPP study area in terms of its existing value as a visual resource, and summarizes the applicable regulatory framework for managing and protecting scenic values. The regulatory framework and methodology for managing and protecting scenic resources have not changed since publication of the PSPP PA/FEIS and remain applicable to the PSEGS, and therefore are not supplemented in this section. However, because the PSEGS dimensions and extent would differ from those identified in the PSPP PA/FEIS, the range of potential effects on visual resources also would be different. Accordingly, a revised visual resources study area is described below.

3.19.1 Project Study Area

The PSEGS site is located in the Mojave Desert geomorphic province of California, also referred to as the Sonoran Desert section of the Basin and Range physiographic region of the United States.[1] More specifically, the project site lies in the Chuckwalla Valley, which measures approximately 40 miles east-west and 15 miles north-south. Numerous isolated mountain ranges surround the valley, including from the north clockwise, the Coxcomb, Granite, Palen, McCoy, Mule, Little Chuckwalla, Chuckwalla, and Eagle Mountain ranges. These ranges are separated by expanses of internally-drained, sparsely vegetated desert plains.

The Chuckwalla Valley floor is mantled by scattered patchworks, or clumps, of Sonoran creosote bush giving it a course, dark green texture, against the smoother tan sandy soil. Trees are scarce about the valley, occurring mainly among developed areas. Bajadas, or converging alluvial fans, drain the surrounding mountains and add color variety and a braided texture to the valley. The bajadas give way to dry desert washes which terminate at dry lakes.

Figure 3.19-1 provides a view of the PSEGS area, as seen from a dirt road immediately north of I-10. As is evident from the photograph, the gently sloping, relatively uniform valley floor contrasts sharply with the dark desert varnish of the rocky and jagged peaks of the surrounding mountain ranges, some of which rise to a height of 4,000 feet. In the photo, the PSEGS would be located in the immediate foreground, and would extend into the middleground of the photo occupied by the dry lake bed. Figure 3.19-2 provides a number of context photographs illustrating common visual features of the desert environment, and the characteristic landscape of the Chuckwalla Valley area. As the figure illustrates, the valley floor is characterized by lightly tan colored, sandy soils, mottled with dark-green shrubby vegetation and intermittent clumps of low-growing grasses. The views are panoramic, inhibited only by the occasional tree or built structure, and extend to the mountain ranges that frame the horizon.

The study area for visual resources is defined as all land areas from which any element of the PSEGS would be visible (i.e., the PSEGS's viewshed). The project viewshed comprises the visual

[1] California's geomorphic provinces and the physiographic regions of the U.S. are naturally defined geologic regions that display a distinct landscape or landform. These divisions are based on unique, defining features such as geology, topographic relief, climate, and vegetation. The distinction between California's geomorphic provinces and the physiographic regions of the U.S. is in the scale at which they are defined.

portion of the affected environment and is the basis for the visual impact analysis provided in Section 4.18, *Impacts on Visual Resources.* The viewshed map is shown in Figure 3.19-3, and was generated via computer-generated viewshed tools. The visual impact threshold distance (VITD) boundary for purposes of this analysis includes those areas within a 30 mile radius of the project site, which encompasses an area of approximately 2,827 square miles.

The map also depicts the status of various public lands within the viewshed. These include the National Park Service-managed Joshua Tree National Park and Wilderness; the BLM-managed Joshua Tree Wilderness, Palen/McCoy Wilderness, Little Chuckwalla Mountains Wilderness, and Chuckwalla Mountains Wilderness; and several BLM Areas of Critical Environmental Concern (ACEC), including those of Palen Dry Lake, Chuckwalla Valley Dune Thicket, Corn Springs, Chuckwalla, Alligator Springs, and Desert Lily. The project's visual intrusion upon these areas varies based upon observer location and terrain. For example, the PSEGS would be visible from approximately 4.9 percent of Joshua Tree National Park (JTNP) approximately 10 percent of the JTNP Wilderness Area (3DScape, 2013), and from the four BLM wilderness areas and five ACECs.

While mostly undeveloped, several cultural modifications are apparent within the Project viewshed. The Interstate 10 corridor bisects the viewshed, passing to the north of the Chuckwalla Mountains and to the immediate south of the project site. The uniform rectilinear green patches of agricultural operations to the northwest of the project site and north of Desert Center contrast with the surrounding dry, sparsely vegetated, and sinuous alluvial fans and rugged mountain faces. The Colorado River Aqueduct (CRA) also features prominently in the Chuckwalla Valley viewshed, comprising a conspicuous linear network of pipes, canals, and service roads that wind around and tunnel through the Coxcomb and Eagle Mountains. Other large-scale man-made features including mining operations, such as the Eagle Mountain Mine and surrounding settlement, located within the northwestern portion of the viewshed. Residential developments within the viewshed have a less distinct impact on the landscape than those previously discussed and range from individual ranges and rural residences to the small communities of Lake Tamarisk and Eagle Mountain, and the largest, Desert Center, with a population of 284 (U.S. Census Bureau, 2013).

The primary user groups that could have views of the PSEGS would be motorists along I-10 and State Route 177. Described more fully in Section 3.17, *Transportation and Public Access – Off Highway Vehicle Resources,* on average, the PSEGS would be visible by approximately 5,300 motorists during peak hour weekday travel on I-10 (i.e., by approximately 2,650 eastbound and 2,650 westbound travelers during the period when traffic volume is at its highest). Other groups likely to be affected include visitors to the Desert Lily Preserve and the Palen Dry Lake area, which are located north of the PSEGS site; motorists accessing the Corn Springs Campground and Chuckwalla Mountains Wilderness via Chuckwalla Valley and Corn Springs Roads; dispersed recreational users; and users seeking opportunities for solitude and unconfined recreation in the surrounding wilderness areas.

The Palen/McCoy Wilderness is immediately northeast of the site, but the area with views of the PSEGS is not used for recreation and features neither trails nor trailheads (CEC Genesis RSA,

2010). However, since the wilderness area is physically accessible, it may be visited on rare occasions by backcountry hikers and overnight campers. The portion of Joshua Tree National Park where the PSEGS could be visible does not contain visitor-serving facilities such as hiking trails, campgrounds or picnic areas—these occur in the central and western portions of the Park, in areas located over 15 miles east of the PSEGS site that are unlikely to have views of the solar fields and structures. Even though the bright light of the two power tower receivers could be visible, it would be small in size and possibly diffused in atmospheric haze. However, the PSEGS could be visible from elevated vantage points within the Coxcomb Mountains, which is the eastern-most part of the park.

3.19.2 BLM Visual Resource Management (VRM) Policy

BLM's Visual Resource Management Policy is the agency's implementation of legal requirements for managing scenic resources, established through NEPA and FLPMA. Under FLPMA, BLM has developed and applied a standard visual assessment methodology to inventory and manage scenic values on lands under its jurisdiction. The BLM manual M-8400-Visual Resource Management, Handbook H-8410-Visual Resource Inventory, and Handbook H-8431-Visual Resource Contrast Rating, set forth the policies and procedures for determining visual resource values, establishing management objectives, and evaluating proposed actions for conformance to the established objectives for BLM administered public lands.

As discussed more fully in the PSPP PA/FEIS (pp. 3.19-2 through 3.19-6), VRM classes typically are assigned by the BLM through its RMPs; however in the case of the CDCA Plan VRM classes have not been established. Instead, BLM land managers must establish "Interim VRM Classes" for individual projects on a case-by-case basis. The DPV 2 EIR/EIS established Interim VRM Classes that cover the PSEGS site, which were mapped by the consultants and approved by the BLM. In accordance, the DPV 2 EIR/EIS established Interim VRM Classes are used for this Project (see Figure 3.19-4). The entire PSEGS site, including the areas encompassing the heliostats, power blocks, and transmission line corridor, is classified as Interim VRM Class III. Wilderness Areas within the viewshed were identified as Interim VRM Class I. As shown in Figure 3.19-4, the three predominant classes of BLM-administered land within the PSEGS viewshed include VRM Class I in the Palen/McCoy and Chuckwalla Mountain wilderness areas; VRM Class II in BLM lands south and southeast of I-10 and the PSEGS site, and VRM Class III along the I-10 corridor and the Chuckwalla Valley north of I-10.

Table 3.19-1 displays the BLM's four visual resource management classes and the objective of each class. The PSEGS would be managed in accordance with Interim VRM Class III objectives. The Interim VRM Class III management objective reflects and is consistent with the land use decisions within the existing plans because the area is also under Multiple-Use Class M (Moderate Use), which is based upon a controlled balance between higher intensity use and protection of public lands. This class provides for a wide variety of present and future uses such as mining, livestock grazing, recreation, energy, and utility development. The objective of Interim VRM Class III is to partially retain the existing character of the landscape.

TABLE 3.19-1
VISUAL RESOURCE MANAGEMENT CLASSES

VRM Class	Objective
Class I	The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention
Class II	The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape
Class III	The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape
Class IV	The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

4.18 Impacts on Visual Resources

This section analyzes the direct and indirect effects on visual resources that would occur with implementation of the PSEGS and identifies measures to avoid or reduce visual effects. Overall, the PSEGS would result in long-term visual alteration to approximately 3,794 acres of land managed under an Interim VRM Class III designation. Issues of viewshed and visibility are discussed at length in this section, and the reader may find it useful to refer to the viewshed map presented in Figure 3.19-3.

4.18.1 Impact Assessment Methodology

The visual resources impact assessment methodology described in PSPP PA/FEIS Section 4.18.1 (p. 4.18-1) was used to analyze the PSEGS in this Draft SEIS. The analysis of direct and indirect impacts associated with the Reconfigured Alternative 2 (Option 1 and Option 2) and No Action Alternative A can be found on PSPP PA/FEIS pages 4.18-18 and 4.18-19, respectively. The discussion of cumulative impacts for these alternatives has been revised as necessary in this Draft SEIS to reflect the updated cumulative scenario (see Section 4.18.3, below).

Selection of Key Observation Points

The PSEGS Key Observation Points (KOPs) include 9 KOPs that were analyzed in the PSPP PA/FEIS[1] as well as 9 new KOPs identified in consultation with the BLM, Tribes, and the National Park Service (NPS). See PPSP PA/FEIS page 4.18-10 and the following for a description of the 9 KOPs shared by the PSPP and PSEGS. New KOPs are also described below.

The new KOPs initially were identified as sensitive receptors (SR) in the Palen Solar Visual Resources Analysis Report (VRAR), completed by 3DScape. SRs are vantage points on the landscape that represent important public and private views that could be affected by the PSEGS. The contrast rating is done from the KOPs, which represent the most critical viewpoints. They are usually along commonly traveled routes or at other likely observation points. Factors that are considered in selecting KOPs are: angle of observation, number of viewers, length of time the project is in view, relative project size, season of use, and light conditions (BLM Manual H-8431). Extensive research was conducted by 3DScape, as described in the PSEGS Visual Resources Analysis, to fully evaluate where SRs are located within the Chuckwalla Valley viewshed. The research relied heavily on previous studies of the visual environment and included published visual studies from the PSPP EIS. The KOPs for the PSPP PA/FEIS were researched and used where applicable. However, the PSEGS proposes a technology that has a substantially greater vertical presence. This requires using a much larger visual impact threshold distance to assure that all potentially visible areas are considered in the analysis. Other documents consulted include the Devers-Palo Verde 2 EIS, Desert Sunlight Solar Farm EIS, Genesis Solar Energy EIS, and the documentation of visual values from documents provided by BLM's Palm Springs South Coast Field Office's (PSSCFO) web site. Secondary research included BLM's Desert Access Guides, USGS quadrangle maps (1:24,000, 1:100,000, and 1:250,000), recent best science research on

[1] PSPP PA/FEIS KOP locations were relocated as closely as possible using GIS data and field-verification.

visual impact threshold distances of renewable energy projects (Argonne National Laboratory), theoretical prediction of glare potential from renewable energy projects (Sandia National Laboratory), and the EISs for the Rio Mesa and Hidden Hills projects proposed by the Applicant using similar technology. Additionally, as stated earlier, the entire breadth of BLM's Solar PEIS is taken into consideration, particularly those discussions centered on the Riverside East SEZ (3DScape, 2013).Development of the KOPs for the PSEGS included consideration of 17 SR points located within the 30-mile-radius (2,827 square miles) visual impact threshold distance (VITD) boundary, as shown in Figure 3.19-3. Given the adjacency of JTNP and its sensitive receptors and dark sky, great care was given to areas administered by the NPS. The viewshed delineation and subsequent analysis of other data layers revealed that the PSEGS viewshed overlays 4.86 percent of JTNP. Because of the proximity of the Coxcomb Mountains, which are a part of the JTNP Wilderness Area, 10.1 percent of the JTNP Wilderness Area is within the PSEGS viewshed. This analysis employed a multiple criteria decision analysis matrix to quantitatively identify which of the SR locations were the most visually sensitive (3DScape, 2013). Based on this analysis, 9 of the 17 SRs were elevated to KOP status. These nine KOPs are added to the baseline visual conditions for the analysis. The SRs that were elevated to KOPs are KOPs 3A, 7A, 8A, 9A, 10A, 12A, 13A, 15A, and 17A. These new KOPs are spatially represented on Figure 4.18-1A.

Visual Simulations

Computer-aided drafting and design (CADD), GIS, and GPS allowed for life-size modeling. These tools utilize real-world scale and coordinates to locate the PSEGS facilities, other site data, and the camera locations corresponding to three-dimensional (3D) simulation viewpoints. The CADD drawings and the KOPs were input into GIS and the camera positioning information was referenced to the 3D data set and the 3D modeling was generated. Using the computerized visual simulations, predicted future visual effects of the PSEGS for each KOP are described below. Visual contrast rating sheets for the PSEGS are not available for the original nine KOPs; however, contrast rating forms have been completed for the nine new KOPs based on the visual simulations.

4.18.2 Direct and Indirect Impacts of the PSEGS

Project Appearance

The PSEGS would convert approximately 3,896 acres (approximately six square miles) of naturally-appearing desert plain to an industrial facility characterized by complex, geometric forms, lines, colors, and textures that are dissimilar to the forms, lines, colors, and textures of the characteristic landscape. Described more fully in Section 3.19, the PSEGS would occur within the Chuckwalla Valley. The valley is characterized by its planar basin comprised of sandy soils and incised drainages, the sinuous lines of alluvial fans descending from the more textured bajadas, and the jagged lines and complex forms of the rugged mountains beyond. The colors generally transition from light tan basin soils mottled with intermittent patches of desert scrub vegetation; giving rise to the darker browns of the bajadas' desert varnish; to the browns, blues, and pinks of the mountains that lighten with their distance on the horizon. See Figure 3.19-1 for a representative photograph depicting the characteristic landscape.

Much of the developed area would be covered with two solar fields consisting of heliostats, generally arranged in concentric circles, each surrounding a power block and power tower at their centers. Figure 4-18.2 shows example images of existing power tower facilities. Figure 4-18.3 shows a simulated rendering of the PSEGS from an oblique view to demonstrate the general configuration and appearance of the power tower facility in the landscape. Figure 4.18-3a includes a simulated rendering of the Project as it would be viewed from ground level, approximately 6 miles to the east, looking west from I-10. Due to the Project's proximity to the interstate, motorists traveling along I-10 are expected to be the user group most likely to encounter views of the Project.

The solar fields of heliostats would occupy most of the disturbed area. Each of the heliostat assemblies would be comprised of two mirrors, each approximately 12 feet tall by 8.5 feet wide, with a total reflecting surface of 204.7 square feet. Figure 4.18-4 shows the size and reflectivity of typical heliostat mirrors. Each heliostat assembly would be mounted on a single pylon and rotate to track the movement of the sun. The final layout would be completed during detailed design, but the entire project is estimated to consist of a total of 170,000 heliostats (85,000 per solar field). Each solar field also would contain a 750-foot-tall power tower (topped by a 10-foot tall lightning rod) and associated power block, along with various buildings and structures for electrical generation and facility maintenance, which mostly range from 10 feet to 120 feet. The tallest proposed structures are the two power towers, followed by two boiler pump power distribution centers, each approximately 160 feet tall, and two air cooled condensers, each approximately 120 feet tall. The project would also include construction of an approximately seven-mile 230 kV power overhead transmission line mounted on poles rising to a maximum height of 120 feet, and a 0.56 mile underground natural gas pipeline extension. The transmission line would extend from the PSEGS electricity switchyard to the Red Bluff Substation. The Red Bluff Substation is located adjacent to and on the south side of I-10, west of the PSEGS site. Figure 2-2 shows the proposed gen-tie line alignment. A steel monopole design would be used for the gen-tie line. This analysis assumes the poles' base diameter would be 6 feet and the top diameter would be 3 feet; the poles would be spaced approximately 1,100 feet apart (Galati, 2013). Once constructed, the poles could have significant visual contrasts in the landscape.

Chapter 2, *Proposed Action and Alternatives,* provides a detailed description of the PSEGS's proposed civil/structural features. The approximate dimensions of these features are summarized below (Table 4.18-1) for purposes of this analysis.

Construction-Phase Impacts

During the construction period, earth-moving activities and construction materials, equipment, trucks, and parked vehicles, all could be visible on the site and along the ROW. Construction would occur over a 34 month period, during which a number of activities would take place, including the construction of the towers and related structures, foundation pouring, earthwork, operation of a concrete batch plant, and heliostat assemblage and installation. The 203-acre temporary construction laydown area on the west side of the site would be used for equipment laydown, construction parking, construction trailers, a tire cleaning station, heliostat assembly, a temporary concrete batch plant and other construction support facilities. Figure 4.18-5 shows an

TABLE 4.18-1
APPROXIMATE DIMENSIONS OF PROJECT STRUCTURES

Component (Quantity)	Dimensions (LxWxH) (Feet) / Capacity	Footprint (square feet)
Common Area		
Administration Building Including Control Room (1)	80x180x34	14,400
Maintenance Shops and Warehouse Building (1)	90x120x48	10,800
Firewater Storage Tank (1)	25x(N/A)x15	N/A
Firewater Pump House (1)	12x36x10	432
Emergency Diesel Generator Enclosure (1)	12x18x10	216
Power Blocks #1 and #2		
Solar Tower Including Solar Receiver Steam Generator (2)	75 (diameter) x750 (height)	N/A
Steam Turbine Generator Enclosure (2)	34x46x52 EA	1,564 EA
Air Cooled Condenser (2)	220x300x120 EA	N/A
Steam Turbine Enclosure (2)	40x56x52 EA	2,240 EA
Steam Turbine Generator Lube Oil Enclosure (2)	22x38x18 EA	836 EA
Deaerator/Feedwater Heater Structure (2)	56x66x80 EA	N/A
Emergency Diesel Generator Enclosure (2)	12x32x12 EA	384 EA
Plant Service Building (2)	56x100x16 EA	5,600 EA
ACC Power Distribution Center (4)	14x50x16 EA	700 EA
Fire Water Pump House (2)	36x12x12 EA	432 EA
Demineralized Water Storage Tank (2)	26x(N/A)x26 EA	N/A
Service/Firewater Storage Tank (2)	40x(N/A)x30 EA	N/A
Mirror Wash Water Storage Tank (2)	25x(N/A)x21 EA	N/A
Boiler Pump Power Distribution Center (2)	50x14x160 EA	700 EA
Waste Water Storage Tank (2)	25x(N/A)x23 EA	N/A
Water Treatment Power Distribution Center (2)	30x14x16 EA	420 EA
Night Preservation Auxilary Boiler (2)	10x12x12 EA	N/A
Start-up Auxilary Boiler (2)	14x56x16 EA	N/A
Mirror Wash Vehicle Refueling and Storage Area Canopy (2)	74x116x24 EA	N/A
Mirror Wash Vehicle Storage Area Canopy (2)	40x184x20 EA	N/A
Wet Surface Air Cooler (WSAC) (2)	48x36x26 EA	N/A
Thermal Evaporation Unit (2)	34x18x64 EA	N/A
Residue Tank (2)	12x(N/A)x13 EA	N/A
Water Treatment Building (2)	66x90x26 EA	5,940 EA
Generator Step-up Transformer (2)	12x26x22 EA	N/A
Drains Tank (2)	12x(N/A)x13 EA	N/A

SOURCE: Palen Solar Holdings, LLC, 2012.

image of a typical construction staging area. PSEGS construction also would include the installation of temporary construction facilities including office trailers, parking areas, material laydown areas, a concrete batch plant, and a heliostat assembly facility. The construction would begin with site roads, and earthwork would include earthen berms around the power block areas to divert storm water, followed by the excavation and placement of foundations and other underground facilities. From the more common viewpoints (e.g., I-10), these construction activities generally would result in a moderate to high degree of visual contrast within the landscape, depending on phase of construction.

However, certain visual effects would be specific to construction activities, and could include the generation of large quantities of airborne dust and nighttime construction lighting. The affected viewers would be primarily the 5,300 motorists passing the project site during peak-hour weekday traffic on I-10, low numbers of OHV users, 204 Desert Center and Lake Tamarisk residents (US Census, 2010), and dispersed users seeking solitude and unconfined recreational opportunities in the surrounding designated wilderness. Although the construction period is estimated to occur over approximately 34 months, construction would be phased, so it would not occur in any one place for the entire period. The maximum acreage estimated to be actively used on any single day is less than or equal to 260 acres. Activities that would generate dust, such as earthmoving, would occur episodically throughout the construction period, and nighttime construction lighting would be required to accommodate swing shifts. Generally, construction activities would occur from 5:00 a.m. to 3:30 p.m. with a swing shift during heliostat assembly (from 6:00 p.m. to 4:00 a.m.) and during tower construction (which may occur in three shifts around the clock until these tasks are completed). Additional hours may be necessary to make up schedule deficiencies, or to complete critical construction activities (e.g., tower construction, foundation pouring, or working around time-critical shutdowns and constraints). During some construction periods and during the startup phase of the PSEGS, some activities would continue 24 hours per day, 7 days per week. Such activities may include but not be limited to the installation of heliostats and pouring of concrete for power towers.

Many of the potential visual impacts associated with the PSEGS, such as those associated with the height and mass of the cooling towers, fencing, administrative complex and control buildings, and other features common to the projects, were also identified in the PSPP PA/FEIS. The mitigation measures identified in the PA/FEIS to minimize these impacts have been adopted by the applicant and incorporated in the PSEGS. Such measures would apply equally to construction and operations activities unique to the PSEGS. These measures, identified in this Draft SEIS as Applicant Proposed Measures (APMs), are presented in Appendix C. APMs that would reduce visible dust emissions include limiting the speed of vehicles, surfacing construction access roads, and controlling wind erosion on soil stockpiles (see APMs AQ-SC-3 and AQ-SC-4). Measures to address the texture and color of project buildings and structures, including the power towers, are addressed in APMs VIS-1 and VIS-5, including the preparation of a Surface Treatment Plan in consultation with a BLM Visual Resource Specialist. When nighttime construction activities take place, illumination would be provided that meets state and federal worker safety regulations. To the extent possible, the PSEGS's nighttime construction lighting would be directed downward or toward the area to be illuminated and would incorporate fixture hooding/shielding. Task-specific

lighting would be used to the extent practical while complying with worker safety regulations (See APM VIS-3). Disturbed areas that would not be needed during operation and maintenance of the PSEGS would be restored, and temporarily disturbed areas would be recovered with soil, brush, rocks, and natural debris (see APMs BIO-8, BIO-22, and VIS-2). Due to the scale and strong forms and lines of the two power towers, VIS-5 has been added to specifically address mitigation measures for the towers and power block structures.

Operation-Phase Impacts

During the operation of the PSEGS, visual effects would be caused by the visible elements of the Project. The discussion below is divided between visual effects that are not fully captured by visual simulations (nighttime lighting and reflected sunlight/glare) and the visual contrast ratings of the PSEGS simulated in each KOP.

Light and Glare (all KOPs, with the exception of KOP-17A)

Operational Lighting

PSEGS operations would require onsite nighttime lighting for safety and security, and heliostat mirror washing, and would require aviation lighting for power tower structures (transmission facilities would not require aviation lighting). The site is located in an area with few existing structures, and the use of uncontrolled or excessive lighting would be noticed by nearby motorists, residents of Desert Center and Lake Tamarisk, and could affect the nighttime experience for dispersed recreational users in surrounding designated wilderness areas. Facilities and operations lighting plans would be developed in consultation with the BLM, Tribes, and NPS. As described more fully in Appendix C, APM VIS-3, to reduce offsite lighting impacts, the Applicant would limit lighting at the facility to areas required for safety, security, and operation. The Applicant would consider setbacks of PSEGS features from the site boundary to aid in satisfying mitigation requirements. Lighting also would incorporate fixture hoods/shielding with light directed downward. Light fixtures that would be visible from the ROW boundary would have cutoff angles that would be sufficient to prevent their visibility from beyond the ROW boundary, except where necessary for security. As much as practical, lighting would be of minimum necessary brightness. Lights in high illumination areas (such as maintenance platforms) would have switches and/or motion detectors so that the lights operate only when the area is occupied. Implementation of these APMs would minimize the amount of lighting potentially visible to viewers of the site at night.

Because the height of the solar thermal power towers exceeds 200 feet, FAA compliant aircraft warning lights would be required (FAA 2007). For the PSEGS, these high-intensity lights would flash white during the day and at twilight and red at night.

Adverse effects of facility lighting are not necessarily limited to views of the site itself. Excessive lighting also could cause an adverse affect to viewers of the night sky via sky glow, which diminishes the visibility of the nighttime sky and stars. Visual simulations prepared by the Applicant indicate that the Project lighting could be visible at night from locations as far away as 19 miles, including from locations north of Desert Center (12.4 miles), Northeast of Eagle

Mountain (19.4 miles), and South of Eagle Mountain (15.6 miles) (Truescape, 2013). Prevention of offsite light spillage for ground observers does not necessarily prevent back-reflected light (i.e., light reflected off the ground and/or structures from down-directed lamps) from diminishing the visibility of the night sky. Normally, the contribution of project-related lighting is negligible when in an environment with abundant light sources; however, the area that could be affected by the PSEGS, specifically NPS lands, is highly valued in terms of the quality of its nighttime skies. This is attributable to the scarce and scattered nature of existing light sources in the surrounding area and the percentage of federally administered land allocated for conservation purposes in the region, which limits opportunities for development. While the level of use in the surrounding wilderness is considered to be low, the high visibility of the nighttime sky and stars is an important component of the wilderness experience for many backcountry users and its protection is a priority NPS management policy.

While the APMs would not totally eliminate the light visible by surrounding user groups, facility lighting would be minimized and controlled such that it would not be a nuisance and would not detract from the ability for affected viewers to enjoy their surroundings.

Glint[2] and Glare[3] from the Heliostats and Power Tower Illumination

Power tower projects generally have larger visual impacts compared to other solar technologies because of the relatively tall and brightly illuminated receiver towers. The solar receiver steam generators (SRSG) on top of the towers are approximately 68 feet tall and 100 feet wide. These dimensions result in an active receiver area of about 21,370 square feet when viewed straight on. In addition to the receiver towers and heliostat fields, the PSEGS would include other components that may have reflective surfaces, such as heliostat support structures, steam turbine generator components, piping, and fencing.

The reflecting surface of the heliostat is essentially a mirror and, as such, is a highly reflective surface. Where visible, heliostats could display highly variable surface color and brightness. Viewed from certain angles, specular reflection, or an object's reflection of light towards an angle opposite that of its approach, might result in glint or glare from these surfaces, particularly from elevated viewpoints. Power tower facilities are typically configured with the heliostats arrayed in concentric circles around the central tower. Unlike parabolic trough collectors, PSEGS heliostats do not face the sun except when the sun and the SRSG are at the same angle from the heliostat's perspective, in which case the heliostats are pointing into the sky and not towards potential sensitive receptors at ground-level. At all other times that they are tracking the sun, the heliostats would face approximately halfway between the sun and the SRSG. The only exception are mirrors in a 90-degree stow position. The only such mirrors allowed to point in the direction of I-10 are those which are blocked from the motorists' view by thousands of other heliostats (not pointed towards the highway). The heliostat supports would be primarily metal and would also

2 Glint is a momentary flash of light resulting from a spatially localized reflection of sunlight. (BLM, 2013)
3 Glare is the sensation produced by luminance within the visual field that is sufficiently greater than the luminance to which the eyes are adapted, which causes annoyance, discomfort, or loss in visual performance and visibility. (BLM, 2013)

reflect light. However, reflectivity of these surfaces would be lessened through APMs specifying paint or low reflectivity coatings, and they often would be shaded by the heliostats in any event.

In addition to visual impacts from the tower structure, the sunlight focused on the SRSG by the heliostats during normal operations causes the surface of the receiver to appear to glow with sufficient intensity to be visible for long distances; however, the apparent glow is actually diffuse reflected sunlight. The tower receivers can appear brilliantly white at close distances, and the light from relatively small-scale existing facilities has been observed at distances of 25 miles. The Applicant estimates that the intensity of light emitted from the SRSG is 70W/m2. For comparison, the intensity of visible light from the sun is 80,000W/m2, meaning that the glow of the receiver tower is estimated to be one-one thousandth that of the sun (0.1%).

The perceived intensity of this reflection would vary based upon the angular size of the object from the vantage point of the viewer. Generally, as distance from the receiver increases the angular size of the object decreases, as does the perceived intensity of the luminance. This intensity is measured by the visual angle (in radians), which is the ratio between the diameter of the receiver and the distance in meters of the viewer from the receiver. For example, at 1.86 miles from the receiver, the visual angle is 0.01 radians, which is about the visual angle of the sun. Moving away from the project site, the visual angle of the SRGS would be 0.037 radians at 0.5 miles, 0.018 radians at 1 mile, 0.009 radians at 2 miles, 0.004 radians at 5 miles, and 0.002 radians at 10 miles. The minimum viewing distance from I-10 towards the northwestern tower is 6,496 feet (1.23 miles) and the minimum viewing distance from I-10 towards the southeastern tower is 4,429 feet (0.84 miles) (PSH, 2013b). Observations to date have not shown the SRSG light to be as intense as the glare observed from parabolic trough facilities (Sullivan et al., 2012).

In addition to heliostat reflections and glare from the SRSG, at certain times of the day and from certain angles, the reflection of sunlight on ambient dust particles in the air could occasionally result in the appearance of light streaming diagonally downward and/or upward from the tower in a luminous, transparent, tent-like form.

Because the design and operation of the power tower and heliostats is integral to generating power, the heliostat mirrors cannot be color treated or dulled. Moreover, since the heliostats would be continually moving throughout the day, the backs of the heliostats would be seen equally as often as the fronts (assuming a fixed vantage point). The Applicant has incorporated the mitigation measures identified in the PSPP PA/FEIS to reduce the frequency of intensity of distracting light and reflected glare from the solar fields. Described more fully in Appendix C, these Applicant Proposed Measures include the painting or treatment of reflective surfaces, including, if necessary, the backs of the heliostats (see APMs TRANS-6, VIS-1 and VIS-5).

With respect to glint and glare specifically, APM TRANS-6 includes provisions for documentation of heliostat position and movement, a description of the health and safety effects of the programmed heliostat operation, and development of a monitoring plan. To further reduce the potential for project-related glint and glare impacts, TRANS-6 is modified to include a

pre-construction glint and glare assessment, as described under Section 4.18.4, *Summary of Mitigation Measures*, below.

Despite the effectiveness of these measures, they would not eliminate the spread reflection or bright glow of the SRSG. The contribution of glint, glare, and receiver light impacts is considered in the contrast discussion of each KOP below. Impacts of glint and glare on public safety are also addressed in Section 4.11, *Public Health and Safety*, of this Draft SEIS.

Glint and Glare from Power Block Buildings, Administrative Buildings, and Transmission Lines

The PSPP PA/FEIS addresses potential impacts associated with glint and glare from the PSPP power block buildings, administrative buildings, and transmission lines on page 4.18-10. The discussion is equally applicable to the PSEGS, and has not been supplemented.

Visual Contrast Ratings

To analyze the visual contrast in the landscape, the PSEGS has been simulated in computer derived photographs of the area for original KOPs 1-9 and new KOPs 3A, 7A, 8A, 9A, 10A, 12A, 13A, 15A, and 17A, described in Section 4.18.1, above. Conclusions of PSEGS visual contrast analysis presented below do not take into consideration the nighttime contrast (lighting color and intensity), which is discussed above. Documentation of the visual contrast ratings (BLM Form 8400-4, Visual Contrast Rating Worksheet) is included in Appendix G.

Noted above, motorists traveling along CA 177 and I-10 are the single largest user group that would be exposed to the visual impacts associated with the PSEGS. Vehicles travel at high rates of speed along these routes and therefore drivers' views of the Project would be fleeting. Moreover, highway drivers have a narrower field of view than other users and are expected to be focused mainly on vehicle operation and road conditions in the immediate foreground. The duration of visual exposure for the average freeway traveler would be about 14 minutes[4]. As such, the PSEGS facility may not be as conspicuous for this user group as it would be for others with greater visual exposure (e.g., hikers, campers, and ORV users) in the area.

KOP-1: Highway 177 and Palen Pass Road

This KOP represents the view for southbound motorists on Highway 117 (Figure 4.18-7). The project is located in a range of 13 to 16 miles south of this KOP. Although the solar fields and structures are greatly diminished due to distance, the glowing power tower receivers are prominently visible, appearing as two bright lights below the horizon of the Chuckwalla Mountains Wilderness. The low viewing angle (and long distance) reduces the visual contrast. Even though the power tower lights would be visible, due to the distance and intervening atmospheric haze, their intensity is diminished. The power towers and associated facilities do not appear to dominate the landscape from this KOP. Glint, which is a momentary event, and glare from the heliostats could momentarily increase the color contrast of the PSEGS.

[4] Assumes an average visual distance of 15 miles and a travel speed of 65 miles per hour.

The Applicant proposes a number of measures to reduce the degree of form, line, color and texture contrast. These measures, described more fully in Appendix C, would include applying color and texture treatments to proposed structures to blend in with the surrounding landscape, by restoring disturbed areas (such as revegetating the landscape), and by strategically placing structures and linear alignments to repeat the basic visual elements in the landscape (see TRANS-6, VIS-1, VIS-2, VIS-4, VIS-5, and VIS-6). For example, Figure 4.18-6 includes an image of vegetation that was preserved and trimmed under the installed heliostats of a constructed power tower project. The Applicant's development and implementation of a heliostat positioning plan, as described in TRANS-6, would prevent bright flashes due to movement in or out of stow position, but would not fully mitigate the effects of glint and glare. In summary, the APMs would reduce glint and glare, and are likely to reduce the degree of color contrast in the landscape. Although the APMs would be visually beneficial, the PSEGS still would be visible and could be perceived from KOP-1.

KOP-2: Highway 177 at the edge of Joshua Tree Wilderness

This KOP represents the view for southbound motorists on Highway 117 and views from low-elevation portions of the far-eastern end of Joshua Tree National Park (JTNP) (Figure 4.18-8). In this portion of the JTNP, there are no hiking trails, picnic areas, campgrounds or other visitor-serving facilities and thus visitor use in the area is expected to be low. The PSEGS is located in a range of 8 to 11 miles southeast of this KOP, and all major elements of the project would be visible, including the power towers, power blocks, structures, and solar fields. The power towers would be more prominent from this viewpoint. The power tower on the left would break the horizon line of the Chuckwalla Mountains Wilderness. However, even though the towers attract attention, they do not dominate the landscape.

Noted previously, the Applicant proposes several measures to reduce the length and intensity of glint and glare. Described more fully in Appendix C, these include treatment of reflective surfaces, revegetating disturbed soils, and incorporating design treatments to minimize visual intrusion, among others (see APMs TRANS-6, VIS-1, VIS-2, VIS-4, VIS-5, and VIS-6). Implementation of these measures would reduce the length and intensity of glint and glare of the solar fields and structures, and would be likely to reduce the degree of color contrast in the landscape; however, these efforts would not totally eliminate the contrast of the PSEGS in the landscape.

KOP-3: Desert Lily Sanctuary entrance/parking area

This KOP represents the view for low numbers of visitors to the Desert Lily ACEC and OHV users (Figure 4.18-9). The PSEGS site is located in a range of 7 to 10 miles southeast of this KOP; all of its major elements would be visible, including both power towers, power blocks, and solar fields. Both power towers rise above the horizon of the Chuckwalla Mountains Wilderness beyond and the receiver lights appear to be more intense in brightness, but because of distance, the towers would not dominate the landscape. The project's incorporation of the above described APMs (i.e., TRANS-6, VIS-1, VIS-2, VIS-4, VIS-5, and VIS-6), would reduce impacts associated with the length and intensity of glint and glare, and the degree of color contrast in the landscape. However, they would not totally eliminate the contrast of the PSEGS in the landscape due to the vertical presence and illumination of the towers and receivers.

KOP-4: Eagle Mountain Road

This KOP represents the view for OHV users, and dispersed recreational users (Figure 4.18-10). The proposed site is located in a range of 13 to 16 miles southeast of this KOP; all major elements of the PSEGS would be visible, including both power towers, power blocks, and solar fields. The power towers would be the tallest structures on the horizon and the bright lights of the receivers would be apparent; however, due to distance and associated atmospheric haze, these elements would not be expected to dominate the landscape. The project's incorporation of the above described APMs, (i.e., TRANS-6, VIS-1, VIS-2, VIS-4, VIS-5, and VIS-6) would reduce the length and intensity of glint and glare, and would be likely to reduce the degree of color contrast in the landscape; however, they would not totally eliminate the contrast of the PSEGS in the landscape due to the vertical presence and illumination of the towers and receivers.

KOP-5: I-10 Interchange at Desert Center

This KOP represents the view for eastbound motorists on I-10 at Desert Center (Figure 4.18-11). The site is located in a range of 8.5 to 11.5 miles east of this KOP. The degree of contrast primarily would result from the vertical power tower structures. During operation, the apparent glow of the receivers would attract attention from a casual observer. The solar field would be screened by vegetation and topography. Incorporation of the above noted APMs (i.e., VIS-1, VIS-2, VIS-4, VIS-5, and VIS-6) would reduce the visual contrast that might otherwise be created by the PSEGS's heliostat field and power block. However, there are no reasonable mitigation measures that would reduce the visual contrast of the two 750-foot-tall power towers protruding above the horizon.

KOP-6: Residential community entrance/exit in Desert Center

This KOP represents the view of the PSEGS for residents in the Desert Center area (Figure 4.18-12). The site is located in a range of 8.5 to 11.5 miles east of this KOP. The visible feature of the PSEGS from this KOP would be the power towers. Intervening topography and structures would screen views of the solar fields and power blocks from this viewpoint. The degree of visual contrast created by the PSEGS from this location would be the same as described above for KOP-5. Thus, for the same reasons described above, the visual contrast would draw attention from the common observer, but would not dominate the landscape.

KOP-7: Corn Springs Road at the edge of Chuckwalla Mountains Wilderness

This KOP represents the view for northbound motorists on Corn Springs Road exiting the access points for the Chuckwalla Mountains Wilderness (Figure 4.18-13). The proposed site is located in a range of 1.5 to 4.5 miles north of this KOP; all of the major elements of the PSEGS would be visible, including both power towers, power blocks, and solar fields. From this KOP, the PSEGS would result in a moderate to strong contrast. The strong contrast would come from the brilliant light of the power tower receivers, glare and glint from the solar fields, and the form of the power block structures and power towers, which are vertical, cubed and rectilinear in a landscape that otherwise is largely absent of such forms. At all times, the PSEGS would likely be a major focus of viewer attention, largely because of the glow of the power tower receivers and structures in the landscape.

Incorporation of APMs would lessen the degree of visual contrast that might otherwise be created by the proposed solar field (see Appendix C, APMs TRANS-6, VIS-1, VIS-2, VIS-4, VIS-5, and VIS-6). Through these measures, the Applicant would reduce the degree of contrast by applying color and texture treatments to project structures to blend in with the surrounding landscape, by revegetating disturbed areas, and by strategically placing structures and linear alignments to repeat the basic visual elements in the landscape. The proposed heliostat positioning plan (TRANS-6) would help prevent bright flashes due to movement in or out of stow position, but would not fully mitigate the effects of glare from diffuse reflections of the sun due to this viewpoint's elevated position. While the color and texture treatments would aid greatly in reducing the color and, due to the size and scale of the PSEGS, it is unlikely that these measures would be sufficient to reduce contrasts in form to moderate levels. Successful implementation of APMs would reduce the color contrast to acceptable levels, except while the power tower is in operation and during periods of glare.

KOP-8: I-10 eastbound near the southwestern corner of the Project

This KOP represents the view for eastbound motorists on I-10 (Figure 4.18-14). The proposed site is located 0.7 to 3.7 miles north of this KOP; most major elements of the PSEGS would be visible, including both power towers, power blocks, and solar fields.

At this close viewing distance, the PSEGS would result in a strong contrast for all of the design elements for the landscape features of vegetation and structures. The strong contrast would come from the brilliant light of the power tower receivers, glare and glint from the solar fields, and the form of the power block structures and power towers, which are vertical, cubed and rectilinear in a characteristic landscape that is otherwise largely absent of such forms. At all times, the PSEGS would likely be a major focus of viewer attention, largely because the landscape is otherwise absent of large structures and the PSEGS would be dominant in the landscape.

Incorporation of APMs would lessen the degree of visual contrast that might otherwise be created by the proposed solar field (see Appendix C, APMs TRANS-6, VIS-1, VIS-2, VIS-4, VIS-5, and VIS-6). Through these measures, the Applicant would reduce the degree of contrast by applying color and texture treatments to project structures to blend in with the surrounding landscape, by revegetating disturbed areas, and by strategically placing structures and linear alignments to repeat the basic visual elements in the landscape. The proposed heliostat positioning plan (TRANS-6) would help prevent bright flashes due to movement in or out of stow position, but would not fully mitigate the effects of glare from diffuse reflections of the sun due to this viewpoint's elevated position. However, due to the brightness of the power tower receiver and the size and scale of the PSEGS from this close distance, it is unlikely that the APMs would be sufficient to reduce contrasts in form, line, and texture to moderate levels. Successful implementation of these APMs would reduce the color contrast to acceptable levels, except during periods of glare.

KOP-9: I-10 westbound near the southeastern corner of the Project

This KOP represents the view for westbound motorists on I-10 (Figure 4.18-15). The proposed site is located 2.5 to 5.5 miles northwest of this KOP; the proposed power towers and power block structures would be visible. The solar fields appear to be screened by topography and

vegetation. The degree of visual contrast created by the proposed power towers from this location is the same as described above for KOP-8.

KOP-10 and KOP-11: Palen-McCoy Wilderness and Chuckwalla Mountains Wilderness

There were no PSEGS simulations created for the PSPP PA/FEIS-analyzed KOP-10 (Palen-McCoy Wilderness) and KOP-11 (Chuckwalla Mountains Wilderness), thus these KOPs are not included in the impact assessment. However, KOP-12A and KOP-15A were completed from very similar locations and will replace KOP-10 and KOP-11 in this impact assessment.

KOP-3A: Coxcomb Mountains Wilderness Area

KOP-3A is located in the Coxcomb Mountains in lands managed by JTNP. Additionally, it is located in Joshua Tree WA. The project site is to the southeast of this KOP. This view is characteristic of the view available to dispersed recreationists in JTNP. Visitor use can be expected to be low because of the lack of visitor services and no established or maintained trail networks. It is 9.9 miles from the PSEGS site and occupies a topographically superior viewing angle.

The contrast rating exercise demonstrates that the Project will produce moderate contrast to the landscape elements of line and form. Weak contrasts were further identified for color and texture. As demonstrated by the visual simulation from KOP-3A, the heliostat array is only faintly discernible from this vantage point due to its slightly inferior angle of observation. The viewer's ability to discern the heliostat field is important, because of its extent and its color contrast with the existing ground plane. The PSEGS as seen from KOP-3A would create moderate visual contrasts of form and line, and weak visual contrasts of color and texture. The project would be in conformance with Class III Interim VRM objectives from this location.

The project's incorporation of the above described APMs (i.e., TRANS-6, VIS-1, VIS-2, VIS-4, VIS-5, and VIS-6), would reduce impacts associated with the length and intensity of glint and glare, and the degree of color contrast in the landscape. However, they would not totally eliminate the contrast of the PSEGS in the landscape due to the vertical presence of the towers and illumination of the receivers.

KOP-7A: Big Wash

KOP-7A is located in JTNP, east of the WA boundary. There is easy access to KOP-7A by Hayfield Road and it occupies a topographically superior viewing perspective. KOP-7A is located 15.5 miles from the PSEGS site and is 850 feet topographically superior. Sensitive users would be dispersed recreationists and motorists on lightly used Hayfield Road. Visitor use is expected to be low.

The contrast rating exercise revealed this KOP experienced moderate contrast to line and form despite being in the BLM defined seldom seen zone. The details of the heliostat field are not visible at this distance. The SRSGs' glow would still be detectable to even the casual observer. The color and texture of the PSEGS created weak contrast but was still a discernible landscape feature and could be more contrasting during days with better atmospheric visibility. The

simulations do not show any glare but the phenomena may occur as reflected sunlight strikes heliostats that are stowed or being cleaned. This glare would be brighter and more specular than the glare from the SRSG. If this were to occur from this topographically superior position it would attract attention. The PSEGS as seen from KOP-7A would create moderate visual contrasts of form and line, and weak visual contrasts of color and texture. Therefore, the Project as viewed from this perspective would be in conformance with Class III Interim VRM objectives.

The Project's incorporation of the above described APMs (i.e., TRANS-6, VIS-1, VIS-2, VIS-4, VIS-5, and VIS-6), would reduce impacts associated with the length and intensity of glint and glare, and the degree of color contrast in the landscape. However, they would not totally eliminate the contrast of the PSEGS in the landscape due to the vertical presence of the towers and illumination of the receivers.

KOP-8A: Dragon Wash

KOP-8A is located within JTNP, approximately a mile from the JTNP WA. KOP-8A is 15.9 miles from the PSEGS site. The elevation of KOP-8A is 1,390 feet AMSL, or 803 feet topographically superior to the PSEGS site. The nearest power tower is 16.2 miles from KOP-8A. Visitors in this area are primarily dispersed recreationists and those with interests in archaeology. KOP-8A is a very similar view to KOP-7A located in JTNP; KOP-8A is four miles southwest of KOP-8A. The contrast rating exercise produced similar results and conclusions; moderate contrast in form and line and weak contrast in color and texture. Therefore, the Project would be in conformance with Class III Interim VRM objectives from this location.

The Project's incorporation of the above described APMs (i.e., TRANS-6, VIS-1, VIS-2, VIS-4, VIS-5, and VIS-6), would reduce impacts associated with the length and intensity of glint and glare, and the degree of color contrast in the landscape. However, they would not totally eliminate the contrast of the PSEGS in the landscape due to the vertical presence of the towers and illumination of the receivers.

KOP-9A: Alligator Rock ACEC

KOP-9A is located within public land administered by the BLM and managed to protect significant prehistoric resources in the area. There are pictographs and lithic procurement areas. The ACEC is 7,726 acres in size; the most notable landscape feature is the local landmark known as Alligator Rock. The topographic screening at KOP-9A obscures a considerable portion of the PSEGS site. Additively, the creosote scrub and small ironwood trees provide additional vegetative screening. The contrast rating exercise conducted for KOP-9A provided these results: weak visual contrasts of form, line, color, and texture. Therefore, the Project would be in conformance with Class III Interim VRM objectives from this location.

The Project's incorporation of the above described APMs (i.e., TRANS-6, VIS-1, VIS-2, VIS-4, VIS-5, and VIS-6), would reduce impacts associated with the length and intensity of glint and glare, and the degree of color contrast in the landscape. However, they would not totally eliminate the contrast of the PSEGS in the landscape due to the vertical presence of the towers and illumination of the receivers.

KOP-10A: Interstate-10 Eastbound

KOP-10A is located along the heavily traveled I-10 transportation corridor (approximately 5,300 vehicles per day). KOP-10A is located 6.4 miles from the nearest power tower. The elevation of the vantage point is 810 feet AMSL, or 227 feet topographically superior to the PSEGS site. From KOP-10A on eastbound I-10, the PSEGS becomes more apparent because of the closer distance. The PSEGS site is located in the background from this vantage point. Details of the Project are discernible. Although the heliostat field is screened from view at this vantage point, the tops of the aircooled condensers are visible as well as over 600 feet of the power tower concrete base and SRSG. The cylindrical form of the power tower becomes apparent. This view has many cultural modifications, including power lines and an electrical substation, which distract from the characteristics of the natural landscape There is co-dominance with the substation and transmission line towers, all with a large vertical presence.

The contrast rating exercise for KOP-10A identified a strong contrast with the element of line; a moderate contrast in form, and weak contrast with texture and color. This can be directly attributable to the screened heliostat array. The two power towers would protrude above the horizon and would attract attention and produce strong “line” contrasts directly in the cone of vision of eastbound I-10 travelers. Cylindrical form contrasts are moderate, and color and texture contrasts are weak as seen from KOP-10A. The two visible power towers would create a major modification of the existing character of the Chuckwalla Valley as seen from the freeway. The tall height and the heavy mass of the towers would become the major focus of viewer attention as seen from KOP-10A.

Taken as a whole, visual impacts to KOP-10A resulting from the Project are expected to be significant, both as for the project as proposed and as mitigated, per BLM VRM standards, guidelines, and best management practices (BMPs). There are no feasible mitigation measures that could be applied that would reduce the visual contrast of the two 750-foot-tall power towers protruding above the horizon. Vegetative screening and/or architectural screening of these features is not feasible. Thus, the PSEGS’s effect on visual resources from KOP-8A would not be brought into conformance with Class III Interim VRM objectives and would be considered an adverse impact on the landscape.

The Project’s incorporation of the above described APMs (i.e., TRANS-6, VIS-1, VIS-2, VIS-4, VIS-5, and VIS-6), would reduce impacts associated with the length and intensity of glint and glare, and the degree of color contrast in the landscape. However, they would not totally eliminate the contrast of the PSEGS in the landscape due to the vertical presence of the towers and illumination of the receivers.

KOP-12A (Replaces KOP-11): Chuckwalla Mountains Wilderness Area

This vantage point is within the Chuckwalla Mountains WA and is located on the extensive bajada on the northeastern slope of the Chuckwalla Mountains. KOP-12A is located just over five miles from the nearest power tower.

The strong contrasts of form, line, and color created by the PSEGS would create a major modification of the existing character of the Chuckwalla Valley and Palen Dry Lake as seen against the backdrop of the Palen Mountains. The Project would be a new dominant feature of the landscape visible from this KOP, which is representative of use areas in this wilderness. The Project would change the existing visual character of the viewshed. The two 750-foot-tall solar power towers are the most visually noticeable elements, and from this view at KOP-12A, the heliostat fields are highly visible too. The heliostat fields are horizontal in line and form, shiny silver or blue in color, and smooth in texture. These characteristics create a strong degree of contrast in form, line, and color and a weak degree of contrast in texture. The Project would change the character of the area, and would dominate the landscape and become the major focus of viewer attention as seen from KOP-12A. Taken as a whole, visual impacts to KOP-12A resulting from the PSEGS would be significant and unmitigable, per BLM VRM standards, guidelines, and best management practices (BMPs). Thus, the PSEGS's effect on visual resources from KOP-12A would not be brought into conformance with Class III Interim VRM objectives and would remain adverse.

There are no reasonable or feasible mitigation measures that could be applied that would reduce the visual contrast of the two 750-foot-tall power towers, the elevated air cooled condensers, or the expansive heliostat fields. Vegetative screening and/or architectural screening of these features is not feasible. The Project's incorporation of the above described APMs (i.e., TRANS-6, VIS-1, VIS-2, VIS-4, VIS-5, and VIS-6), would reduce contrasts associated with the length and intensity of glint and glare, and the degree of color contrast in the landscape. However, they would not totally eliminate the contrast of the PSEGS in the landscape due to the vertical presence of the towers and illumination of the receivers.

KOP-13A: Interstate-10 Westbound

KOP-13A is from westbound I-10, 6.4 miles from the PSEGS site. It occupies a typical perspective of the landscape of the Chuckwalla Valley. The two power towers would protrude above the horizon, attract attention, and produce strong "line" contrasts. Form contrasts are moderate, and color and texture contrasts are weak as seen from the westbound freeway. The two visible power towers would create a major modification of the existing character of the Chuckwalla Valley as seen from the freeway. The PSEGS would be a strongly contrasting feature in form, line, and color within the landscape visible from KOP-13A due to the vertical presence of the towers and illumination of the receivers. The Project would become the major focus of viewer attention as seen from KOP-13A.

Taken as a whole, visual impacts to KOP-13A resulting from the PSEGS are expected to be significant and unmitigable, per BLM VRM standards, guidelines, and best management practices (BMPs). Thus, the PSEGS's effect on visual resources from KOP-8A would not be brought into conformance with Class III Interim VRM objectives and would remain adverse.

There are no reasonable or feasible mitigation measures that could be applied that would reduce the visual contrast of the two 750-foot-tall power towers protruding above the horizon. Vegetative screening and/or architectural screening of these features is impractical. The Project's incorporation of the above described APMs (i.e., TRANS-6, VIS-1, VIS-2, VIS-4, VIS-5, and

VIS-6), would reduce impacts associated with the length and intensity of glint and glare, and the degree of color contrast in the landscape.

KOP-15A (Replaces KOP-10): Palen McCoy Wilderness Area

KOP-15A is in the Palen McCoy WA, approximately 6 miles from the PSEGS site. The image was captured in 2010 by AECOM and the vantage point was used as KOP-10A in the PSPP EIS. The elevation from this the vantage point provides an excellent perspective of the southern Chuckwalla Valley. This vantage point is one mile from an access road into the WA. Receptors would be dispersed recreationists seeking solitude and vistas.

The strong contrasts of form, line, and color created by the PSEGS would create a major modification of the existing character of the Chuckwalla Valley and Palen Dry Lake, as seen against the backdrop of the Chuckwalla Mountains. The Project would be a new dominant feature of the landscape visible from this WA. The Project would change the existing visual character of the viewshed. The two 750-foot-tall solar power towers would be the most visually noticeable elements, and from this view at KOP-15A, the elevated air cooled condensers and heliostat fields would be highly visible too. The Project would change the character of the area, dominate the view, and become the major focus of viewer attention as seen from KOP-15A.

The visual character in the area of Palen Dry Lake would change from open space desert to that of a developed, industrial landscape. The overall visual impact of the PSEGS would completely alter the existing undeveloped scenic quality of this characteristic landscape, and convert it to an industrialized solar-electric landscape. However, some viewers may see the development of a solar resource facility as a point of positive visual interest. Taken as a whole, visual impacts to KOP-15A resulting from the Project would be significant and unmitigable, per BLM VRM standards, guidelines, and best management practices (BMPs). Therefore, the PSEGS would not comply with the definition of Class III, above, as seen from KOP-15A in the Palen / McCoy Wilderness Area.

There are no reasonable or feasible mitigation measures that could be applied that would reduce the visual contrast of the two 750-foot-tall power towers, the elevated air cooled condensers, or the expansive and highly reflective heliostat fields. Vegetative screening and/or architectural screening of these features is impractical, if not impossible. Thus, the PSEGS's effect on visual resources from KOP-15A would not be brought into conformance with Class III Interim VRM objectives and would remain adverse. The Project's incorporation of the above described APMs (i.e., TRANS-6, VIS-1, VIS-2, VIS-4, VIS-5, and VIS-6), would reduce impacts associated with the length and intensity of glint and glare, and the degree of color contrast in the landscape. However, they would not totally eliminate the contrast of the PSEGS in the landscape due to the vertical presence of the towers and illumination of the receivers.

KOP-17A: Bradshaw Trail

The Bradshaw Trail's vantage point (SR-17) is located in the SW 1/4, SE 1/4, Sec. 9, T8S, R20E SBB&M. SR-17 is 22.8 miles from the nearest power tower. The elevation of KOP-17A is 589 feet AMSL, or 32 feet topographically superior to the PSGES site. The PSEGS is not visible from KOP-17A.

Impacts to BLM Wilderness Areas and Joshua Tree National Park

The four wilderness areas in the vicinity of the proposed site have no developed trails, or adjoining parking/ trailheads, or other visitor use facilities. These areas are generally steep, rugged mountains. Visitor use within the wilderness areas appears to be very light, although BLM has no visitor use counts. Observations by staff and Law Enforcement Rangers indicate only 100 to 200 hikers per year within the wilderness areas. Visitation to the desert peaks listed by the Sierra Club Angeles Chapter is discussed in PA/FEIS Chapter 3 (page 3.13-4). More popular is vehicle camping along roads that are adjacent to the wilderness areas. RV camping near wilderness areas, with associated hiking, OHV use, photography, sightseeing, etc. accounts for up to 2,000 visitors per year.

Figures 3.19-3 and 3.19.3a show designated wilderness areas within the PSEGS viewshed. Views of the PSEGS from special designations generally would be in mountainous areas that offer elevated viewpoints similar to KOP-4A, KOP-10A and KOP-11A. Users of these areas would be able to view the Project, but opportunities for solitude and unconfined recreation would not be greatly impacted due to the distance of the PSEGS from the wilderness area. Where the Project would be readily visible in mountainous areas beyond five miles, the level of contrast would remain moderate because the project would not dominate the view as a whole. While the proposed power tower receiver lights may be noticeable, they would not overwhelm or dominate the panoramic views or more visually appealing elements of the scene, such as the rugged mountain ranges, the open sky, and the undisturbed portions of the valley floor. For portions of designated wilderness within 5 miles of the site, the level of contrast would be strong because the PSEGS could dominate views of the valley, and would not in compliance with VRM objectives, as discussed above for KOP-10A and KOP-11A. The portion of JTNP where the PSEGS could be visible would be within the background visibility zone and does not contain visitor-serving facilities such as hiking trails, campgrounds or picnic areas. For the reasons above, impacts to the visitor experience to BLM wilderness and JTNP would be minor.

Decommissioning

The purpose of decommissioning is to remove project-related structures and infrastructure so that affected lands could naturalize. However, until landform and vegetative restoration is achieved, adverse visual impacts would be similar to those described in the operation-phase impacts, because large areas would be devoid of desert scrub vegetation. The impacts of decommissioning would be somewhat reduced in intensity, however, as compared to construction, because the contrast created by the power towers, power block structures and solar fields would be removed. The contrast in the design elements of form and line would remain. These impacts would be reduced through the APMs, which would incorporate techniques to reduce areas of disturbance, revegetate impacted areas, and select plant species appropriate for the surrounding landscape (see VIS-2 and VIS-4 for additional details). Furthermore, upon closure of the facility, the Applicant would implement the Project's Decommissioning and Reclamation Plan, along with numerous proposed impact avoidance and minimization measures (see Appendix C, APMs BIO-8, BIO-22, VIS-4, and VIS-4). These efforts would ensure the visual impacts of decommissioning are minor and short-term and the site is returned to a condition that is visually compatible with the surrounding characteristic landscape.

4.18.3 Cumulative Impacts

PSEGS

Impacts resulting from construction, operation, maintenance and decommissioning of the PSEGS could result in a cumulative effect on visual resources when combined with the incremental effects of past, other present, or reasonably foreseeable future actions. The geographic scope of the cumulative effects analysis for visual resources consists of the I-10 corridor (where visual impacts could be synergistic), and locations from which a viewer could see the PSEGS along with views of other projects (where visual impacts could be additive). This geographic scope of cumulative impacts analysis was established based on the natural boundaries of the affected resource, i.e., potential shared viewsheds, and not on jurisdictional boundaries. Potential cumulative effects on visual resources could occur during the proposed 34-month construction period (e.g., from cumulative construction disturbances), during the projected lifespan of the PSEGS (e.g., project form, line, color, and/or texture contrast with the landscape, including contrasts from glint and glare), or result from closure and decommissioning (e.g., until restoration efforts return the landscape to its original condition).

Existing conditions within the area of cumulative effects analysis reflect a combination of the natural condition and the effects of past actions and are described in Chapter 3. Direct and indirect effects of the PSEGS are analyzed above. Direct and indirect effects of the alternatives described in Chapter 2 are analyzed in the PSPP PA/FEIS (see page 4.18-18 et seq.). Past, present, and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1.4, *Cumulative Scenario Approach*. These include the Blythe, Genesis, Rice, Palen, Desert Sunlight, Chuckwalla, Eagle Crest Pump Storage, Nextera McCoy, Desert Quartzsite, and Mule Mountain Soleil solar power projects and associated generation-tie lines. These solar power projects are expected to result in synergistic visual impacts for travelers along I-10, as well as visual impacts to dispersed recreational users in the surrounding areas.

Visual changes as a result of other projects in the cumulative scenario could be located within the line of sight for travelers along I-10 viewing the project. Related cumulative effects are analyzed in the PSPP PA/FEIS (see page 4.18-20 et seq.). This analysis applies equally to the PSEGS and has not been supplemented.

Dispersed wilderness users, including recreational users, in the Palen-McCoy Mountains, Chuckwalla Mountains, JTNP, and Joshua Tree Wilderness surrounding the project —due to their elevated position and access to unencumbered, panoramic views of the valley below—could experience both additive and synergistic impacts in the cumulative scenario. Related cumulative effects are analyzed in the PSPP PA/FEIS (see page 4.18-21 et seq.). This analysis applies equally to the PSEGS and has not been supplemented.

Reconfigured Alternative 2 (Option 1 and Option 2)

Direct and indirect effects of Reconfigured Alternative 2 (Option 1 and Option 2) are analyzed in the PSPP PA/FEIS (see page 4.18-18 et seq.). Reconfigured Alternative 2 would have a similar

effect with respect to visual resources. Visual resource impacts would remain adverse for this alternative. However this alternative would not include the power towers and associated visual resource impacts.

No Action Alternative A

If No Action Alternative A was selected, the PSEGS would not occur at the project site. However, since the ROW application area is located within the Riverside East SEZ, the CDCA Plan amendment decisions made in the Solar PEIS ROD that identify the area as suitable for any type of solar energy development would be in effect for future projects. This includes prioritization of solar energy development in the SEZ. It is likely, therefore, that this site in the future would be developed as a solar energy project. Nonetheless, because no existing or foreseeable projects are located within the cumulative effects area of the project site, no cumulative impacts to visual resources would be created.

4.18.4 Summary of Mitigation Measures

Described in Chapter 2, *Proposed Action and Alternatives,* the Applicant has incorporated into the PSEGS nearly all of the mitigation measures identified in the PSPP PA/FEIS. These measures, referred to in this Draft SEIS as APMs are included in Appendix C. Specific modifications to these measures to further address the potential effects of the PSEGS are shown below with added text underlined and deleted text in ~~strikethrough.~~ Please see Appendix C for a full description of these measures. No additional measures are feasible or would appreciably reduce the residual visual resource impacts, after incorporation of the APMs.

VIS-1: Surface Treatment of Project Structures and Buildings. The project owner shall treat the surfaces of all project structures and buildings visible to the public such that a) their colors minimize visual intrusion and contrast by blending with (matching) the existing characteristic landscape colors; b) their colors and finishes do not create excessive glare; and c) their colors and finishes are consistent, when possible, with local policies and ordinances. The transmission line conductors shall be non-specular and non-reflective, and the insulators shall be non-reflective and non-refractive. Grouped structures shall be painted the same color to reduce visual complexity and color contrast.

VIS-3: Temporary and Permanent Exterior Lighting. ~~To~~ In addition to measures identified in VIS-6, and to the extent feasible, consistent with safety and security considerations, the project owner shall design and install all permanent exterior lighting and all temporary construction lighting such that a) lamps and reflectors are not visible from beyond the project site, including any off-site security buffer areas; b) lighting does not cause excessive reflected glare; c) direct lighting does not illuminate the nighttime sky, except for required FAA aircraft safety lighting (which should be an on-demand, ~~audio-~~visual warning system that is triggered by radar technology if allowed by FAA regulations and if the cost is no more than $1 million for both towers); d) illumination of the project and its immediate vicinity is minimized, and e) the plan complies with federal and state OSHA and with local policies and ordinances. The project owner shall submit to BLM's Authorized Officer and the CPM for review and approval, and

simultaneously to the County of Riverside and NPS Joshua Tree NP (see VIS-6) for review and comment a lighting mitigation plan.

VIS-4: Project Design. To the extent possible, the project owner will use proper design fundamentals to reduce the visual contrast to the characteristic landscape. These include proper siting and location; reduction of visibility; repetition of form, line, color (see VIS 1) and texture of the landscape; and reduction of unnecessary disturbance. Design strategies to address these fundamentals will be based on the following factors:

…

Vegetation Manipulation: Retain as much of the existing vegetation as possible. Use existing vegetation to screen the development from public viewing. Use scalloped, irregular cleared edges to reduce line contrast as determined in VIS-1. Use irregular clearing shapes to reduce form contrast. Feather and thin the edges of cleared areas and retain a representative mix of plant species and sizes.

…

Signs: The use of signs and project construction signs shall be minimized. Necessary signs shall be made of nonglare materials and utilize unobtrusive colors. The reverse sides of signs and mounts shall be painted or coated by using the most suitable color selected from the BLM Standard Environmental Color Chart or other sources approved by BLM to reduce color contrasts with the existing landscape; however, placements and design of any signs required by safety regulations must conform to regulatory requirements.

Linear Alignments: Use existing topography to hide induced changes associated with roads, lines, and other linear features. Select alignments that follow landscape contours. Avoid fall-line cuts and bisecting ridge tops. Hug vegetation lines and avoid open areas such as valley bottoms. Cross highway corridors and less sharp angles. The visual color contrast of graveled surfaces shall be reduced with approved color treatment practices.

Construction: No paint or permanent discoloring agents shall be applied to rocks or vegetation to indicate surveyor construction activity limits. All stakes and flagging shall be removed from the construction area upon completion of construction and disposed of in an approved facility.

VIS-5 (Previously Identified as BLM-VIS-1): Power Block and Power Tower Appearance. In addition to the measures identified in VIS-1, the project owner shall paint power blocks structures and other vertical construction shadow gray as shown on the BLM Color Chart. The solar tower may be left untreated concrete. The backs of ~~solar troughs~~ heliostat mirrors shall also be ~~color treated to minimize color contrasts~~ designed to minimize reflectivity.

TRANS-6: Heliostat Positioning Plan. The project owner shall prepare and implement a Heliostat Positioning Plan that would minimize potential for human health and safety hazards and bird injury or mortality from solar radiation exposure. The Heliostat Positioning Plan shall accomplish the following:

…

2) Assess the effects of the potential glint and glare associated with the proposed heliostat positions and movements determined through Item 1. The assessment shall quantify the potential glint and glare effects and determine public health, safety, and visual impacts at KOPs identified in the PSEGS Draft SEIS. In addition, the analysis shall identify the maximum project-related glint and glare that could be experienced by motorists along I-10. The assessment shall be conducted by qualified individuals using appropriate and commonly accepted software and procedures. The assessment results must be made available to the BLM in advance of project approval. If the project design is changed during the siting and design process such that substantial changes to glint and glare effects may occur, glint and glare effects shall be recalculated, and the results shall be made available to BLM.

4.18.5 Residual Impacts after Mitigation Measures were Implemented

Even with adherence to all APMs, residual impacts to visual resources would remain. Section 4.18.6 provides a description of these residual impacts.

4.18.6 Unavoidable Adverse Impacts

1. Visual impacts to surrounding viewer groups (all KOPs, except 17A) from the single, strong vertical power tower forms (2 total) that would contrast strongly with the natural forms colors, lines and texture of the landscape. For example that is a strong tower line contrast with the horizon lines. Additionally, the brilliant white light of the receiver at the top of the towers would present a unique and strong color contrast that generally would be very conspicuous, even at long distances as seen by the casual observer.

2. Visual impacts to surrounding viewer groups (all KOPs, except 17A) from sunlight reflected off of the heliostat mirrors (glare).

3. Visual impacts due to the general level of visual contrast of the PSEGS in the landscape, and non-conformance with Interim VRM Class III objectives.

4. Unavoidable and adverse cumulative impacts for travelers along I-10 and dispersed recreational users in the Palen/McCoy, Big Maria, and Little Maria Mountains and wilderness.