

CALIFORNIA ENERGY COMMISSION

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May 15, 2013

Mr. Scott Galati
Galati/Blek, LLP
455 Capitol Mall, Suite 350
Sacramento, CA 95814

California Energy Commission

DOCKETED**09-AFC-7C**

TN 70824

MAY 15 2013

**RE: PALEN SOLAR PROJECT AMENDMENT (09-AFC-7C)
DATA REQUEST SET 3 (Nos. 40–72)**

Dear Mr. Galati,

The California Energy Commission staff has reviewed the Petition for Amendment for the Palen Solar Electric Generating System and requires additional information to supplement the environmental analysis pursuant to Title 20, California Code of Regulations, section 1769(a)(1)(E). The California Energy Commission staff seeks the information specified in the enclosed Data Requests. The information requested is necessary to: 1) more fully understand the project; 2) assess whether the facility will be constructed and operated in compliance with applicable regulations; 3) assess whether the project will result in significant environmental impacts; 4) assess whether the facilities will be constructed and operated in a safe, efficient, and reliable manner; and 5) assess potential mitigation measures.

This set of Data Requests (Nos. 40-72) is being made in the areas of: Biological Resources (No. 40-53), Cultural Resources (Nos. 54-57), Traffic and Transportation (Nos. 58-69) and Waste Management (Nos. 70-72). Staff requests that written responses to the enclosed Data Requests be provided on or before June 14, 2013. Staff encourages the Applicant to submit responses sooner if possible in order to facilitate the schedule.

If you are unable to provide the information requested, need additional time, or object to providing the requested information, please send a written notice to both the Committee and me within 20 days of receipt of this information request. The notification should contain the reasons for not providing the information and the grounds for any objections.

If you have any questions, please call me at (916) 654-4745, or email me at christine.stora@energy.ca.gov.

Sincerely,

A handwritten signature in blue ink that reads "Christine Stora".

Christine Stora
Compliance Project Manager

Enclosure:
Data Requests

**PALEN SOLAR POWER PROJECT (09-AFC-7C)
DATA REQUESTS – SET 3**

Technical Area: Biological Resources

Authors: William Haas, Chris Huntley, and Carol Watson

BACKGROUND: AVIFAUNA BASELINE DATA COLLECTION

Renewable Energy Action Team (REAT) agencies' biologists include staff from the U.S. Fish and Wildlife Service (USFWS), Bureau of Land Management (BLM), California Department of Fish and Wildlife (CDFW), and California Energy Commission. The REAT agencies biologists are concerned that resident and migratory birds may be killed or injured due to the construction and operation of the proposed power tower project. These effects include but are not limited to injuries or risk of mortality due to collisions with the power towers and heliostats, exposure to concentrated solar energy (flux), or by attempting to perch on the power towers. In order to further evaluate these risks the REAT agencies biologists have worked collaboratively to develop site-specific survey protocols to support the analysis of the Palen Solar Electric Generating System's (project) direct, indirect, and cumulative impacts to avian species. The REAT agencies' guidance titled Interagency Recommendations: Migratory and Breeding Season Bird and Bat Baseline Data for the Palen Solar Energy Generating System (PSEGS) Project, Riverside County, California, was transmitted to the project owner on March 15, 2013. This guidance includes both specific methods for the collection of baseline data and recommendations for long-term studies that provide data for evaluating long-term use of the project area by various species of birds. Information highlighted in the Interagency Recommendations included guidance on determining species abundance and diversity; evaluating habitat use and flight patterns in the area; and obtaining information on the assemblage of migratory, breeding, resident, and wintering species that occur in the area. Specific guidance focused on:

- Breeding and non-breeding season avian surveys for passerine, waterfowl, and upland birds;
- Migration surveys;
- Breeding and non-breeding season surveys for golden eagle and other raptor surveys; and
- Recommendations for bat surveys.

The intent of these data requests is to:

- Specify survey data staff considers necessary to support the analysis or compliance requirements for the project for avian species and bats;
- Ascertain the existing types and methods of surveys currently planned or underway to document avian use, abundance, and migratory patterns;
- Obtain required analysis and data to support the potential use of the site by various species of birds or bats; and
- Obtain required data and analysis to determine the effects of flux to vegetation and to support the management of vegetation and weeds.

The information requested would provide staff with data to address changes in the proposed technology; notably a shift from trough to power tower technology. Use of power towers alters the risk to avian species when compared to the approved project. These factors may include: exposure to elevated levels of solar flux; increased collision risk with heliostats and power towers; alteration of bird behavior including risk to migratory birds from Federal Aviation Administration tower-lighting requirements; mirror washing; and vegetation management activities.

The Energy Commission staff understands that the project owner is currently conducting avian surveys according to an internally-developed protocol that was coordinated with the USFWS and CDFW, and featuring the point count method for passerine birds. At staff's May 6, 2013 workshop, the agreement was reached that the project owner would continue surveys during the spring according to this internal protocol (through June); however, the next round of surveys would adopt the REAT agencies' biologists' survey recommendations, featuring distance sampling techniques.

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40. Please provide an avian survey plan to the Energy Commission staff that details the types of surveys and their methodologies already under implementation in 2012 and in spring 2013, as well as for future avian survey work efforts following REAT agency survey guidance. The REAT agencies expect that data collection will continue through permitting and until construction, when other avian survey guidance documents would be available (e.g. The Breeding Bird Conservation Strategy). While the Energy Commission staff acknowledges that the project owner has provided some information regarding surveys both in the May 6, 2013 workshop (relative to start and stop dates) and in the February 2013 Supplement No. 1 Petition to Amend (TN 69471), a comprehensive survey plan containing all pertinent information has yet to be received. All data collected by diurnal survey efforts would be used to inform the risk characterization necessary for development of a Bird and Bat Conservation Strategy (BBCS; formerly referred to as Avian and Bat Protection Plan) for these resources.

- a. **General Species Occurrence:** Please conduct breeding season (15 February to 15 June), surveys to determine avifaunal species richness, distribution, and abundance - including listed and special-status species, in the microphyll woodlands, creosote bush scrub and other habitats on and immediately adjacent to the project footprint (1.6 km), using a distance sampling approach that conforms to widely accepted ornithological methods and allows for statistically defensible analysis. The surveyors should use line transect surveys of a standard length (e.g., 1 km) randomly distributed within the project area and sufficient to address all on-site habitats in proportion to their occurrence. At least two standard-length transects should also be established along/within microphyll woodland habitat (that is, the chosen drainages and starting points of these survey should be randomly determined but each survey route should be dedicated to a microphyll habitat corridor. Additional survey information gathered regularly in this manner during fall (2013) migration and winter (2013-2014) will contribute to a greater understanding of on-site avifauna to support staff analysis.

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- b. Migration Surveys:** At the Palen site, spring migration extends from around 15 February through 1 June. Fall migration may start as early as 15 July (especially for southbound shorebirds) but is maximized in the time period between 15 August and 15 December. Qualified biologists should determine migration trends during the fall and 2013 spring migration and between 1 May and 1 June, as comprehensively as possible. Migration surveys are needed to identify avian migration and use patterns at and near the proposed project location for use in avian risk characterization associated with a project-specific BBCS. At a minimum, migration surveys should provide data suitable for quantitative analysis and cover the period when most of the major pulses or waves of migration occur during spring and fall migration (Bibby et al. 2000) and additional surveys should cover the breeding and wintering seasons.

All site-specific migration data collected prior to this request should be provided in a summary report that identifies survey dates; surveys hours and condition, and complete avian species list. Please compile pertinent migration data for the general area from peer-reviewed list-servs and groups (online resources, e.g., eBird, inlandcountybirds, etc), survey results from nearby projects, and other available databases.

- c. Radar Studies:** Please determine avian and bat migration pulses using radar. This method is useful particularly for evaluating nocturnal migration but also has benefit to document daytime movements. We encourage the project owner to examine historic weather radar data (e.g., NexRad data at the closest areas from which it is available) to document historic migration patterns through southern California deserts. We do not believe that at this late juncture the use of portable radar equipment for spring 2013 surveys would be beneficial. We encourage the project owner to use portable technology to assess migration through the area in fall 2013 and winter/spring of 2014 in order to support the BBCS.
- d. State-listed Species:** Please determine the occurrence of the state-listed Gila woodpecker (*Melanerpes uropygialis*) and elf owl (*Micrathene whitneyi*) on-site and in the general vicinity of the project using focused surveys or through line transect surveys, if sufficient habitat for the species were considered. Status of the owl should be determined by means of focused surveys and should include the use of audio tape play-back. Elf owl breeding habitats are limited within the project area thus thorough coverage is expected.

Assessment of burrowing owl occurrence during the breeding season should include focused surveys adhering to California Burrowing Owl Consortium protocols (CBOC 1997). Results of burrowing owl surveys if previously conducted should be provided. At minimum Phase I and Phase II Burrowing Owl protocol components should be conducted between 15 April and 15 June and a report provided. Surveys for the burrowing owl should continue in winter 2013-2014 in order to support the BBCS.

Please provide the results of the migratory bird surveys to the Energy Commission staff within two weeks of their completion. The survey report should

minimally include a detailed description of the methods used; list of surveyors and their qualifications (pre-approval of surveyors by the agencies is recommended) time, date, and weather conditions during surveys. Submittals of interim survey results to Energy Commission staff, BLM, USFWS, and CDFW and will be evaluated by the agencies as received.

41. Please provide quarterly results of these surveys to the Energy Commission staff, within two weeks of their completion. The survey reports should include a detailed description of the methodology; list of surveyors and their qualifications (pre-approval of surveyors by the agencies is recommended); time, date, and weather conditions during surveys; and species observed. Affidavits from biologists as to the veracity and completeness of the reports should be included. For all bird and bat surveys, we request that the project owner ensure that only experienced, qualified biologists are used to collect survey data from and around the site.

BACKGROUND: GOLDEN EAGLE AND OTHER RAPTOR BREEDING SEASON SURVEYS

Several special status raptor species as well as two species of vulture may occur in the area and potentially be impacted by the project, including bald and golden eagles, ferruginous hawks, Swainson's hawks, elf owl, long eared owl, and turkey vultures. Uncommon species in this category may also occur (e.g., Harris's hawk, crested caracara, and black vulture).

The project owner has submitted winter 2012 golden eagle survey results, which were docketed on April 8, 2013 (TN 70242). The Palen Solar Holdings LLC's (PSH or project owner) Status Report 1 for Palen, docketed on March 29, 2013 (TN 70179), indicated that PSH will be conducting spring surveys for golden eagles on April 6, 7, and 8, 2013. It is our understanding that the project owner is currently conducting ongoing surveys for raptors and golden eagles and is closely coordinating with the REAT agencies' biologists. On March 11, 2013, staff published "USFWS Clarifications on Golden Eagle Surveys for the Proposed Palen Project" (TN 69897), as well as the "Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and other Recommendations in Support of Golden Eagle Management and Permit Issuance" (TN 69896) (Pagel et al 2010). These documents were provided to the project owner for implementation during the surveys. Staff has recommended the project owner provide further information on raptors and golden eagles in the project region to reflect the increased risk to these species from the use of power tower technology. This information will facilitate the analysis of risk to the species and may provide data for developing appropriate mitigation.

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42. The project owner should continue with raptor surveys already agreed to with the REAT agencies' biologists and currently being conducted. The survey report should address the issue of golden eagle (GOEA) occurrence not only in the context of project area use and eagle survey results, but also with respect to the approximately ten-years of data that are available from the BLM for the area surrounding the project (Personal communication of Energy Commission biologists with Dr. Joel Pagel, USFWS biologist, during the Palen site visit, April 9, 2013) to provide

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information on the natural history of the species as well as its distribution in the region. Please provide information describing how the project will affect golden eagles taking into account the following topics:

- a. Recent historical occurrence in the vicinity of the project area; area (please do not include specific reference to nest locations which can be described in terms of their distance to the center or edge of the project);
 - b. The species' natural history including:
 - I. Territory and home range size and characteristics in desert habitats,
 - II. Migration (both north- and southbound),
 - III. Movements of floaters – that is, local as well as far ranging adults, sub-adults, and juveniles that do not have established territories - especially the nature of their movements (e.g., are these movements random? Are they limited within a region? etc.), and potential distances that this species may travel especially in desert habitats.
 - c. The meta-population dynamics of this species to fill the niche of adults that have lost a mate; adults that have been forced to leave a breeding site due to disturbance; an individual that has been evicted by a competitor; individuals lost from a territory or a post-breeding home range; for example, through man-caused mortality (e.g., gunshot, electrocution, etc.); or natural causes (e.g., old age, sickness).
43. Given that most large raptors seek out and utilize thermal air currents (Bildstein 2006) during migration (i.e., to facilitate long-distance movements) as well as daily (e.g., to warm as well as to initiate hunting behaviors), please describe thermal currents that are expected to occur in the vicinity of heliostat fields as well as in the immediate vicinity of collection towers and their implication to golden eagles as well as other large raptors both local and migrant.

Qualifications: For raptor surveys, “qualified biologist” means B.S. or higher degree in avian biology/ornithology/raptor ecology, prior experience with hawk migration counts (verifiable experience at known raptor migration location should be presented to Energy Commission staff, BLM and USFWS prior to commencing surveys), and prior experience with raptor species likely to occur in and near the project area. Observers should have demonstrated ability to identify raptors (eagles to age class) visually while in flight from distances of 200-1500 m.

44. Please compile a comprehensive avian species list for the project site and general vicinity, including birds both likely to occur as regular resident, migrants, and rare migrants. Please incorporate migration data from the Salton Sea area. Please provide data regarding the risk to these species and information regarding expected elevations at which these species migrate.

BACKGROUND: BAT SURVEYS

Given the region's importance to resident and migratory bat species, the REAT agencies' biologists are concerned that special-status bats may be impacted by construction and operation of the proposed project. To establish an environmental baseline for determining the project's potential for impacts to special-status bats, the agencies are requesting site specific survey data for the project area, necessary to augment the preliminary bat habitat assessment that was performed by the previous project applicant. Staff has recommended the project owner provide further information on bat use to reflect the increased risk to these species from collision, night-time lighting, and maintenance activities including mirror washing and vegetation management.

Additionally, the BLM's Proposed Northern & Eastern Colorado Desert Coordinated Management Plan (NECO) requires the project owner to perform surveys for bat roosts within one mile of the project site to aid in identification of impacts. As part of its analysis, staff will be responsible for determining the project's conformance with all applicable laws, ordinances, regulations, and standards (LORS), including the NECO plan.

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45. Please provide data on the type and distribution of bats in the project area. Bat survey data should be sufficient to provide adequate information to determine bat species richness and distribution in the proposed project area. This can be accomplished by deploying acoustical monitoring stations (e.g., Avisoft UltraSoundGate 116Hme CM16/CMPA (Avisoft Bioacoustics), Batcorder 2.0 (ecoObs), Batlogger (Elekon AG), or Songmeter SM2 BAT (Wildlife Acoustics) or AnaBat SD2 (Titley Scientific). Acoustical monitoring data should be collected continuously between 1 May and 1 October at no less than three separate stations within the proposed project area. If the minimum three sites are chosen, we recommend that at least one station should be established in each of the following: 1) microphyll woodland 2) adjacent to or within agricultural areas, especially any accessible open water area, and 3) in the vicinity of a proposed tower location. The number of collection units deployed should be adequately spaced to provide representative maximum coverage of the project area. Specific detection mechanisms, locations, and heights should receive concurrence by appropriate agency personnel before surveys begin. Chosen technology and number of detectors should be able to assess airspace above and below the height of heliostats as well as at heights near the top of the collection tower(s).

Some systems have a useful range of no more than 100 meters above their placement locations. Larger bats with lower-frequency sonar are also difficult to assess because of a triad of issues: the heights at which they fly (i.e., the heights above or below sonar detectors), the low frequency of their sonar, and the fact that larger bats often occur naturally in lower population numbers. Larger desert-dwelling bats such as the western bonneted bat (*Eumops perotis*) and the Townsend's big-eared bat (*Corynorhinus townsendii*) often fly well above 100 meters whereas species such as the California leaf-nosed bat (*Macrotus californicus*) and pallid bat (*Antrozous pallidus*), both of which have excellent eyesight, are rarely detected in

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flight by this technology and may not rely much on sonar when in hunting mode. Sampling methods should be designed to ensure detection of these species should they occur in the project area. These should include:

- 1) Active visual and aural monitoring;
- 2) Complementary ultrasound monitoring (e.g., Echo Meter EM3+ (Wildlife Acoustics) or other computer-based real-time monitoring with visual screen output); and
- 3) Enhanced visual monitoring using infrared-sensing detectors (e.g., night vision glass and/or camera equipment),

The individual or individuals conducting these specialized studies must be capable not only of wav file analysis but also the behaviors and nighttime field identification of all of these large desert-dwelling bats. Verifiable experience using these methods should be presented to Energy Commission staff, the BLM and USFWS prior to commencing surveys.

46. Please perform an assessment of bat roost habitat, including identification of suitable day roosts, hibernacula, and maternity roosts, within the project area and vicinity. Please provide an illustration that identifies suitable roost habitat by the aforementioned types on a figure with the proposed project components and areas of proposed ground disturbance or vegetation/structure removal.
47. Please provide a description of movement patterns of bats between roost sites in the vicinity of the project and foraging habitat within the project area, including a map depicting suitable roosts and foraging habitat. Also, provide an assessment of the project's impacts to these movement patterns for special-status bats.
48. Please coordinate with BLM to determine an appropriate survey methodology to detect bat roosts within one mile of the project site, as required per NECO. Submit the survey guidance to the Energy Commission, as well as a final survey report documenting the results of the surveys.

BACKGROUND: EFFECTS OF POWER TOWERS ON FLIGHTED SPECIES

The potential exists for large solar thermal projects to impact flighted species: insects, bats, and birds. Avian species are protected under the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act and special status bats are of concern. REAT agencies' biologists have expressed concern about the potential adverse effects of concentrating solar projects to insects, birds, bats, and eagles due to direct injury and mortality from exposure to elevated solar flux generated over the heliostat field and collisions with project features, as well as the potential for substantial indirect impacts due to loss of 3,794 acres of habitat. Staff needs to analyze the potential for direct and indirect impacts to birds and bats from the project's two 750-foot tall power towers, the energy flux that will be emitted from the towers, and the resultant changes in radiant heat, light, and humidity. Staff requests additional data regarding expected energy flux

and radiant heat to be emitted by the proposed towers and over the mirror field and the resultant changes in humidity that may affect habitat.

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49. Please provide an analysis of the impacts to desert dry wash woodland and other vegetation in the project area from reflected/concentrated solar energy flux and the potential resultant changes in light, heat, and humidity.
50. Please provide a description of the safety requirements for workers at active power tower facilities, including personal protective equipment, safety distances, and temporal and spatial restrictions when working in the heliostat fields, applicable to biologists conducting surveys or doing other work within the site.
51. Please compile a comprehensive insect species list for the project site and general vicinity, including insects both likely to occur as residents and migrants, with an emphasis on identifying special status insects. Please provide data regarding the risk to these species and information regarding expected elevations at which these species migrate. For pollinator species, please identify common host plants; indicate if the plants occur onsite.

BACKGROUND: VEGETATION MANAGEMENT

The project owner has proposed use of a “low impact design”, which would leave the site primarily vegetated, and confine most on-site project travel to improved roads with dust control. However, in many instances this vegetation would be subject to mowing. While there are obvious advantages to leaving vegetation relatively intact, the long-term viability of desert species subject to a mowing regime has yet to be demonstrated. Under the approved project, a weed management plan was required as a condition of certification. However, the site was originally intended to be graded and maintained free of vegetation. Staff is requesting this information to gain an understanding of how the current project, which intends to leave most of the vegetation on site intact, albeit subject to mowing, may cause increased risk to vegetation from the spread of invasive weeds.

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52. Please provide documentation demonstrating the viability and persistence of native desert vegetation subject to routine mowing. Please provide staff the data including information on ability of onsite soils to support plant regrowth under the proposed disturbance regimes, the levels of essential growth nutrients in the soil at the site, and how these nutrients may be affected over the 30 year life of the project.
53. Prepare a Vegetation Management Plan and submit it to Energy Commission staff. The Vegetation Management Plan should incorporate the life history and physiological constraints and growth patterns as determined in the previous task. The Vegetation Management Plan should include the mowing plan, and must include a framework for management of the site in the event of loss of native vegetation, significant declines in vegetative vigor, or a successional shift to predominately weedy species across the project site.

**PALEN SOLAR POWER PROJECT (09-AFC-7C)
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REFERENCES

- Bart, J. and S. Earnst. 2002. Double Sampling to Estimate Density and Population Trends in Birds. *Auk* 119(1):36-45.
- Bibby, C.J., N.D. Burgess, D.A. Hill, S.H. Mustoe. 2000. *Bird Census Techniques*. Academic Press.
- Bildstein, K.L. 2006. *Migrating raptors of the world*. Cornell Univ. Press.
- Bildstein, K.L., J.P. Smith and R. Yosef. 2007. Migration counts and monitoring. In D.M. Bird and K.L. Bildstein (eds.). *Raptor research and management techniques*. Hancock House Publ., Surry, BC.
- Brightsource, Energy, Inc. 2012. Applicant's Response to Data Requests, Set 2A, #150. Dated July 20, 2012. TN #66280.
- Buckland, S.T., Anderson, D.R., Burnham, K.P. and Laake, J.L. 1993. *Distance Sampling: Estimating Abundance of Biological Populations*. Chapman and Hall, London. 446pp.
- Buckland, S. T., Anderson, D. R., Burnham, K. P., Laake, J. L., Borchers, D. L. & Thomas, L. 2001. *Introduction to distance sampling - Estimating abundance of biological populations*. Oxford University Press. Oxford. 432pp.
- Buckland, S. T., Anderson, D. R., Burnham, K. P., Laake, J. L., Borchers, D. & Thomas, L. 2004. *Advanced Distance Sampling*. Oxford University Press. Oxford. 434pp.
- California Burrowing Owl Consortium (CBOC). 1997. Burrowing owl survey protocol and mitigation guidelines. *J. Raptor Res. Rept.* 9:171-177.
- California Department of Fish and Game (CDFW). 2012. California Department of Fish and Game, Staff Report on Burrowing Owl Mitigation. 36 pp.
- Farnsworth, G.L., J.D. Nichols, J.R. Sauer, S.G. Fancy, K.H. Pollock, S.A. Shriner, and T.R. Simons. 2005. Statistical approaches to the analysis of point count data: a little extra information can go a long way. Pages 736-743 In *Bird conservation implementation and integration in the Americas: Proceedings of the third international partners in flight conference*. March 22-24, 2002. Asilomar, California, Volume 2 (C.J. Ralph and T.D. Rich, Eds.). Gen. Tech. Rep. PSW-GTR-191.
- Gauthreaux, S.A. and C.G. Belser. 2005. Radar ornithology and the conservation of migratory birds. In C. John Ralph and Terrell D. Rich (eds.). *Bird Conservation Implementation and Integration in the Americas: Proceedings of the Third International Partners in Flight Conference*. 2002 March 20-24; Pp.871-875.
- Hawk Migration Association of North America (HMANA). 2010a. Data collection protocol. Available at http://hmana.org/data_entry_paper.php. Accessed 26 Nov. 2010.

- Hawk Migration Association of North America (HMANA). 2010b. Use of hawkcount.org data for wind energy siting. Available at http://hmana.org/Hawkcount_Wind_Siting.php?PHPSESSID=23d221733b5ec31abdf2693ffa3e4dc1. Accessed 28 Nov. 2010.
- Nichols, J.D., J.E. Hines, J.R. Sauer, F.W. Fallon, J.E. Fallon, and P.E. Heglund. 2000. A Double-observer Approach for Estimating Detection Probability and Abundance from Point Counts. *Auk* 117(2):393-408.
- Pagel, J.E., D.M. Whittington, and G.T. Allen. 2010. Interim golden eagle inventory and monitoring protocols; and other recommendations. Division of Migratory Bird Management, U.S. Fish and Wildlife Service.
- Rosenstock, S.S., D.R. Anderson, K.M. Giesen, T. Leukering, and M.F. Carter. 2002. Landbird Counting Techniques: Current Practices and an Alternative. *Auk* 119(1):46-53.
- Ruth, J.M., R.H. Diehl, and R.K. Felix, Jr. 2012. Migrating birds' use of stopover habitat in the Southwestern United States. *Condor* 114(4): 698-710.

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DATA REQUESTS – SET 3**

Technical Area: Cultural Resources
Author: Amber Grady

BUILT-ENVIRONMENT INVENTORY

BACKGROUND

As previously stated in Data Requests Set 2, the addition of two, 750-foot solar power towers to the licensed project stands to significantly increase the visibility of the project across that portion of Chuckwalla Valley, relative to the visibility of the project if it had been built as originally licensed. Due to this significant increase in visibility, staff needs additional built-environment data in order to develop that portion of the cultural resources analysis for the preliminary staff assessment. As stated in Data Requests Set 2, the revised Project Area of Analysis (PAA) will include all visible areas within a maximum of 15 miles away from the project area boundary. Known historic-age buildings and structures are located in the town of Desert Center located approximately 8 miles west of the project site. The setting of this town will be significantly altered with the introduction of two 750-foot solar power towers. In order to determine if significant impact(s) will occur, all historic-age buildings and structures need to be evaluated for California Register of Historical Resources (CRHR) eligibility by professionals meeting the Secretary of the Interior Standards.

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54. Please provide a list of all historic-age (i.e., 50 years old or older) buildings and structures within the PAA including the following information:
 - a. Address/other location data
 - b. Type of building/structure (e.g., single-family residence, commercial building, transmission line, etc.)
 - c. Date of construction - including the source of this information
55. Please provide a map, of no less than a 1:24,000 scale, depicting all of the historic-age buildings and structures within the PAA.
56. Please provide a district evaluation of the community of Desert Center following the Office of Historic Preservation's *Instructions for Recording Historical Resources* (March 1995). Please provide a map depicting the boundary with a narrative justification for the boundary based on the period of significance. All extant buildings, structures, and features (e.g., landscaping, roads, etc.) shall be shown on a sketch map and labeled as contributing or non-contributing to the district.
57. Please provide an evaluation of all historic-age building(s) and structure(s) within the PAA that have not been previously evaluated and/or were not included in the Desert Center evaluation requested above. All evaluations must be prepared using the Office of Historic Preservation's *Instructions for Recording Historical Resources* (March 1995) and recorded on the appropriate DPR form(s).

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Technical Area: Traffic and Transportation – Glint and Glare
Author: Gregg Irvin, Ph.D.

BACKGROUND

The ability of light to cause injury to the retina has been shown both clinically and experimentally. Light can result in retinal damage through photothermal, photomechanical, and photochemical mechanisms.

Photothermal damage is the physical damage to the retina that can occur from high levels of irradiance. Irradiance is the density of radiation on a given surface. Well established standards are provided by the American National Standards Institute (ANSI, Z136.1-2000) for protection of the human eye from photic exposure.

Photomechanical damage is mediated by an acoustic process and is associated with high energy pulses of extremely short duration, such as a laser exposure. Photomechanical damage mechanisms are not relevant to the Palen Solar Electric Generating System (PSEGS).

Photochemical damage is associated with both long-duration exposure times as well as lower-wavelength (higher-energy) light exposure. While retina pigment epithelium (RPE) and the neurosensory retina are protected from light-induced exposure by the absorption profile of the surrounding ocular structures (e.g., cornea, crystalline lens, macular pigments) as well as through retinal photoreceptor outer segment regeneration, photic injury is still quite possible due to photochemical retinal light toxicity mechanisms.

Photochemical injury is both dose dependent and cumulative in nature. The time dependent nature is such that it has been estimated that the half-life (1/e) cumulative dose exposure effect is on the order of 30 days. This has significant implications for observers that spend a significant amount of time in proximity to the high luminance solar field in the additional presence of high ambient (existing) luminance characteristic of a desert environment.

As retinal injury can be caused by exposure to otherwise innocuous visible light, there appears to be some critical dose or threshold at which exposure becomes injurious. The safe exposure times for common ophthalmic instruments (e.g., fundal photography) has been reported in the literature and supports the concept of a critical threshold dose necessary for injury.

DATA REQUESTS

58. Please address the potential for photothermal retinal damage to motorists on I-10 given the direct exposure effects of the solar field/ tower exposure levels.
59. Please address the potential for photochemical retinal damage to motorists on I-10 given the cumulative exposure effects of the combined terrestrial ambient and solar field/ tower exposure levels.

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BACKGROUND

Glint and glare from heliostat reflections could produce harmful effects on human observers. During plant operation, the probability of heliostat reflections directly intercepting pedestrians, motorists, and airborne observers would be influenced by heliostat positioning, including heliostats in standby positions, and heliostat transition strategies used.

An aviation concern is aircraft exposure to glint and glare produced by heliostats in the standby position, where they would be reflecting upward toward the sky, by heliostats in transition to or from standby, and by any heliostats creating reflected energy spillage or leakage past the tower margins. These situations could potentially result in glint and or glare visual impacts to pilots.

Staff recognizes that the heliostats are focused to maximize the incident energy on the solar receiver steam generator (SRSG). For heliostats in transition or in the standby positions, this generally results in a beam divergence beyond the SRSG. This beam divergence, or “diluted reflected energy”, reduces the incident energy of direct heliostat reflections to potential airborne observers, as a function of range to the towers.

DATA REQUESTS

60. Please provide an estimate of the number of heliostats in the standby position for nominal or average operation conditions and for the condition in which the number of heliostats in standby is at a maximum (presumably a midday full sun).
61. Please provide a discussion of the heliostat positioning algorithms to address optimum path selection for minimizing reflected sunrays on all unintended areas (airborne, ground-based, and any forbidden areas, including the intermittent presence of aircraft for known flight paths, such as military training routes VR-296, VR-1265, VR-1268, and IR-218, or unknown flight paths).
62. Please provide the luminance (cd/m²) as a function of range to tower for a direct reflection from a single heliostat (with representative focal lengths) in the standby position for distances of 1, 2, 5 and 10 miles.
63. Please provide details about planned mirror washing activities. If mirror washing would occur during the day, please include the time of day, the position of the mirrors during washing, the number of mirrors to be washed simultaneously, and details of any potential glint and glare impacts from the mirror washing.

BACKGROUND

Glint and glare from heliostat mirror arrays and SRSGs may cause viewers to experience transient visual impairment, distraction, and disruption. Therefore, the potential for glint and glare to distract or cause temporary visual impairment to motorists, cyclists, pedestrians, and pilots needs to be addressed.

**PALEN SOLAR POWER PROJECT (09-AFC-7C)
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Additionally, the impact of glare from the SRSGs needs to be considered within the context of a spatially extended emissive source. An SRSG is visually larger than the sun at a considerable range of viewing distances.

DATA REQUESTS

64. Please provide the dimensions of the active region of the SRSGs, i.e., the physical size in height and width of the SRSG region being illuminated under normal operating conditions.
65. For the SRSG regions being illuminated under normal operating conditions please provide the visual angle dimensions in degrees (the sizes) of the SRSG regions as a function of viewing distance from the ground to both of the SRSGs for 0.5, 1, 2, 5 and 10 miles.
66. For the SRSG region being illuminated under normal operating conditions, please provide the maximum luminance and the luminance under normal operating conditions in candelas per meter squared (cd/m^2) as a function of viewing distance from the ground to the SRSG for 0.5, 1, 2, 5 and 10 miles. Please provide this for each tower for eight viewing directions starting from the north and differing by 45 degree increments (i.e., N, NE, E, SE, S, SW, W and NW).
67. Please provide the luminance of representative sky backgrounds in the region of the SRSGs for these viewing conditions.
68. Please provide the minimum viewing distance from motorists on Interstate 10 to both Unit 1 and 2 towers.
69. Please address the potential for motorists at nominal viewing distances from the project to experience apparent glare and visual disruption from the SRSGs and heliostats, given the incident luminous energy predicted to be experienced by observers.

**PALEN SOLAR POWER PROJECT (09-AFC-7C)
DATA REQUESTS – SET 3**

Technical Area: Waste Management
Author: Ellen Townsend-Hough

BACKGROUND

The staff analysis for the approved Palen project was published December 15, 2010. The Phase I Environmental Site Assessment (ESA) presented in the Application for Certification for the Approved project was completed in May 2009. At the time the 2009 ESA was completed, portions of the site to be developed included federal and private property and the site was larger than the proposed project.

In 2002, The EPA was charged under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) to establish by rule the “generally accepted good commercial and customary standards and practices” that had to be followed by a party seeking immunity from property contamination liability. The American Society for Testing and Materials (ASTM) established method ASTM 1527-05 (Standard Practice for Environmental Site Assessments), to provide procedures for conducting investigations to adequately evaluate the potential for a site to contain contamination. The EPA adopted the ASTM procedures and, after November 1, 2006, buyers and sellers of real estate were compelled to comply with the requirements of the Environmental Protection Agency’s “All Appropriate Inquiry Rule,” or follow the standards set forth in the ASTM E1527-05 Phase I Environmental Site Assessment Process, to satisfy the statutory requirements for conducting all appropriate inquiries.

In ASTM E 1527-05, provisions for updating an existing ESA are provided. According to ASTM E 1527-05, Section 4.6, *Continued Viability of Environmental Site Assessment* and Section 6 *User’s Responsibility*, the ESA is required to be updated within a year if a new project is proposed for the property on which the initial ESA was prepared.

Specifically, Section 4.6 of ASTM E 1527 states:

4.6 Continued Viability of Environmental Site Assessment—

Subject to Section 4.8, an *environmental site assessment* meeting or exceeding this practice and completed less than 180 days prior to the date of acquisition of the *property* or (for transactions not involving an acquisition) the date of the intended transaction is presumed to be valid. If within this period the assessment will be used by a different *user* than the *user* for whom the assessment was originally prepared, the subsequent *user* must also satisfy the User’s Responsibilities in Section 6.

Subject to Section 4.8 and the User’s Responsibilities set forth in Section 6, an *environmental site assessment* meeting or exceeding this practice and for which the information was collected or updated within one year prior to the date of acquisition of the *property* or (for transactions not involving an acquisition) the date of the intended transaction may be used provided that the following components of the inquiries were conducted or updated within 180 days of the date of purchase or the date of the intended transaction:

- I. *interviews with owners, operators, and occupants;*

**PALEN SOLAR POWER PROJECT (09-AFC-7C)
DATA REQUESTS – SET 3**

- II. searches for recorded environmental cleanup liens;
- III. reviews of federal, tribal, state, and local government records;
- IV. visual inspections of the *property* and of *adjoining properties*; and
- V. the declaration by the *environmental professional* responsible for the assessment or update.

In summary ASTM E1527-05 states:

An ESA meeting or exceeding E 1527 is presumed to be valid if "completed less than 180 days prior to the date of acquisition."

1. An ESA for which information was collected or updated within one year prior to the date of acquisition may be used as long as the following components were collected or updated within 180 days of the date of intended acquisition: interviews with owners, operators and occupants; searches for environmental cleanup liens; review of federal, tribal, state and local government records; visual inspections of the subject property and adjacent properties; a declaration by the environmental professional (EP) for the assessment or update.
2. A Phase I ESA that is older than one year may be used as a "prior assessment" reference. The older historical data is history (unchangeable) and therefore it is valid and can be used. This includes such data as fire insurance maps, historical topos, historical street directories and aerial photos.

The Phase I Environmental Site Assessment prepared for the approved project has not been updated in over five years.

DATA REQUEST

70. In accordance with requirements stated in ASTM E 1527-05, please provide an updated Phase I ESA that describes the proposed project site, existing site conditions and identify any new Recognized Environmental Conditions in accordance with the previously indicated testing standard.

BACKGROUND

The configuration and technology of the proposed project is altered from the approved project; therefore, the quantities of and composition of expected waste will be different from the approved project. Staff will review the estimates of waste generated by the proposed project and will compare those volumes/weights to that acknowledged in the approved project. In addition, staff will compare the differences in waste composition generated by each of the two technologies, verify that the quantity and composition of waste is not burdensome to Riverside County, and verify that construction waste will be recycled in accordance with Title 24, CCR, Part 11 2010 Green Building Standards Code (CalGreen). Staff will also verify that there is sufficient landfill capacity in Riverside County for disposal of project wastes.

**PALEN SOLAR POWER PROJECT (09-AFC-7C)
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DATA REQUEST

In order for staff to provide the analyses described above, please provide,

71. a table that lists construction non-hazardous and hazardous waste totals, include type of waste, origin, composition, estimated quantity and volume of each waste, classification, and disposal methods and,
72. a table that lists operation non-hazardous and hazardous waste totals include type of waste, origin, composition, estimated quantity and volume of each waste, classification and disposal methods.



**BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
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1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV**

**AMENDMENT
FOR THE PALEN SOLAR ELECTRIC
GENERATING SYSTEM**

**Docket No. 09-AFC-7C
PROOF OF SERVICE
(Revised 05/09/2013)**

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KAREN DOUGLAS
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DAVID HOCHSCHILD
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*Kelly Foley
Adviser to Associate Member

Eileen Allen
Commissioners' Technical
Adviser for Facility Siting

DECLARATION OF SERVICE

I, Christine Stora, declare that on May 15, 2013, I served and filed copies of the attached Palen Data Request 3 (Nos. 40-72), dated May 15, 2013. This document is accompanied by the most recent Proof of Service, which I copied from the web page for this project at: <http://www.energy.ca.gov/sitingcases/palen/compliance/>.

The document has been sent to the other persons on the Service List above in the following manner:

(Check one)

For service to all other parties and filing with the Docket Unit at the Energy Commission:

I e-mailed the document to all e-mail addresses on the Service List above and personally delivered it or deposited it in the U.S. mail with first class postage to those parties noted above as "hard copy required";
OR

Instead of e-mailing the document, I personally delivered it or deposited it in the U.S. mail with first class postage to all of the persons on the Service List for whom a mailing address is given.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that I am over the age of 18 years.

Dated: May 15, 2013

Christine Stora