

Memorandum

Date: January 12, 2010
Telephone: (916) 654-4679

To: Commissioner Jeffrey Byron, Presiding Member
Commissioner James D. Boyd, Associate Member

From: California Energy Commission – John Kessler, Project Manager
1516 Ninth Street
Sacramento, CA 95814-5512

DOCKET	
07-AFC-5	
DATE	01/12/10
RECD.	01/13/10

**Subject: STAFF’S PROPOSED REVISIONS TO CONDITIONS OF CERTIFICATION
SOIL & WATER AND TRAFFIC & TRANSPORTATION
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM (07-AFC-5)
Exhibit 312**

SUMMARY

Energy Commission staff is providing a third round of edits to its proposed Conditions of Certification as included in staff’s and BLM’s Final Staff Assessment/Draft Environmental Impact Statement (FSA/DEIS). Staff also previously proposed edits to its Conditions of Certification in Exhibit 302 as filed on December 14, 2009 and Exhibit 303 as filed on January 4, 2010. The edits contained herein pertain to Soil and Water Resources Conditions of Certification SOIL&WATER-1, -4 and -5, and Traffic and Transportation TRANS-4, and reflect the latest discussions between staff and applicant, and our agreement.

Docket (07-AFC-5)
Webworks
POS

PROOF OF SERVICE (REVISED 11/23/09) FILED WITH
ORIGINAL MAILED FROM SACRAMENTO ON 1/13/10
MS

Proposed Changes to Conditions of Certification for Topics Addressed in This Filing

SOIL AND WATER RESOURCES

DRAINAGE EROSION AND SEDIMENTATION CONTROL PLAN

SOIL & WATER-1: Prior to site mobilization, the project owner shall obtain both BLM's Authorized Officer and the CPM's approval for a site specific DESCPC that ensures protection of water quality and soil resources of the project site and all linear facilities for both the construction and operation phases of the project. This plan shall address appropriate methods and actions, both temporary and permanent, for the protection of water quality and soil resources, demonstrate no increase in off-site flooding potential, and identify all monitoring and maintenance activities. The project owner shall complete all ~~necessary~~ engineering plans, reports, and documents necessary for both BLM's Authorized Officer and the CMPM to conduct a review of the proposed project and provide a written evaluation as to whether the proposed grading, drainage improvements, and flood management activities comply with all requirements presented herein. The plan shall be consistent with the grading and drainage plan as required by Condition of Certification **CIVIL-1** and shall contain the following elements:

Vicinity Map: A map shall be provided indicating the location of all project elements with depictions of all major geographic features to include watercourses, washes, irrigation and drainage canals, major utilities, and sensitive areas.

Site Delineation: The site and all project elements shall be delineated showing boundary lines of all construction areas and the location of all existing and proposed structures, underground utilities, roads, and drainage facilities. Adjacent property owners shall be identified on the plan maps. All maps shall be presented at a legible scale

Drainage: The DESCPC shall include the following elements:

- a. Topography. Topography for offsite areas are required to define the existing upstream tributary areas to the site and downstream to provide enough definition to map the existing storm water flow and flood hazard. Spot elevations shall be required where relatively flat conditions exist.
- b. Proposed Grade. Proposed grade contours shall be shown at a scale appropriate for delineation of onsite ephemeral washes, drainage ditches, and tie-ins to the existing topography.
- c. Hydrology. Existing and proposed hydrologic calculations for onsite areas and offsite areas that drain to the site; include maps showing the drainage area boundaries and sizes in acres, topography and typical overland flow

directions, and show all existing, interim, and proposed drainage infrastructure and their intended direction of flow.

- d. Hydraulics. Provide hydraulic calculations to support the selection and sizing of the onsite drainage network, diversion facilities and BMPs.

Watercourses and Critical Areas: The DESCPC shall show the location of all onsite and nearby watercourses including washes, irrigation and drainage canals, and drainage ditches, and shall indicate the proximity of those features to the construction site. Maps shall identify high hazard flood prone areas.

Clearing and Grading: The plan shall provide a delineation of all areas to be cleared of vegetation, areas to be preserved, and areas where vegetation would be cut to allow clear movement of the heliostats. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross-sections, cut/fill depths or other means. The locations of any disposal areas, fills, or other special features shall also be shown. Existing and proposed topography tying in proposed contours with existing topography shall be illustrated. The DESCPC shall include a statement of the quantities of material excavated at the site, whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported or a statement explaining that there would be no clearing and/or grading conducted for each element of the project. Areas of no disturbance shall be properly identified and delineated on the plan maps.

Soil Wind and Water Erosion Control: The plan shall address exposed soil treatments to be used during construction and operation of the proposed project for both road and non-road surfaces including specifically identifying all chemical based dust palliatives, soil bonding, and weighting agents appropriate for use at the proposed project site that would not cause adverse effects to vegetation; BMPs shall include measures designed to prevent wind and water erosion including application of chemical dust palliatives after rough grading to limit water use. All dust palliatives, soil binders, and weighting agents shall be approved by both BLM's Authorized Officer and the CPM prior to use.

Project Schedule: The DESCPC shall identify on the topographic site map the location of the site-specific BMPs to be employed during each phase of construction (initial grading, project element construction, and final grading/stabilization). ~~Separate~~ BMP implementation schedules shall be provided for each project element for each phase of construction.

Best Management Practices: The DESCPC shall show the location, timing, and maintenance schedule of all erosion- and sediment-control BMPs to be used prior to initial grading, during project element excavation and construction, during final grading/stabilization, and after construction. BMPs shall include measures designed to control dust and stabilize

construction access roads and entrances. The maintenance schedule shall include post-construction maintenance of treatment-control BMPs applied to disturbed areas following construction.

Erosion Control Drawings: The erosion-control drawings and narrative shall be designed, stamped and sealed by a professional engineer or erosion-control specialist.

Agency Comments: The DESCPC shall include copies of recommendations, ~~conditions and provisions~~ from the County of San Bernardino, California Department of Fish and Game (CDFG), and Lahontan Regional Water Quality Control Board (RWQCB).

Monitoring Plan: Monitoring activities shall include routine measurement of the volume of accumulated sediment in the onsite drainage ditches, and storm water diversions and the requirements specified in Appendix B, C, and D.

Verification: The DESCPC shall be consistent with the grading and drainage plan as required by Condition of Certification **CIVIL-1**, and relevant portions of the DESCPC shall ~~clearly show approval by~~ be submitted to the chief building official (CBO) for review and approval. In addition, the project owner shall do all of the following:

- a. No later than ninety (90) days prior to start of site mobilization, the project owner shall submit a copy of the DESCPC to the County of San Bernardino ~~and~~, the RWQCB, ~~the BLM's authorized officer, and CPM~~ for review and comment. Both BLM's Authorized Officer and the CPM shall consider comments received from San Bernardino County and RWQCB and approve the DESCPC.
- b. During construction, the project owner shall provide an analysis in the monthly compliance report on the effectiveness of the drainage-, erosion- and sediment-control measures and the results of monitoring and maintenance activities.
- c. Once operational, the project owner shall provide in the annual compliance report information on the results of storm water BMP monitoring and maintenance activities.
- d. Provide BLM's Authorized Officer and the CPM with two (2) copies each of all monitoring or ~~other~~ compliance reports ~~required for compliance with San Bernardino County, CDFG and RWQCB.~~

CONSTRUCTION AND OPERATIONS WATER USE

(Staff and applicant are still discussing possible edits to **SOIL&WATER-4**.)

SOIL&WATER-4: ~~The project owner proposes to construct and operate the project in phases, beginning with Ivanpah 1, then Ivanpah 2, and ending with Ivanpah 3. The proposed project's use of groundwater during each year of construction shall not exceed an average of 200 acre-feet per year over the forty-three (43) month construction period. more than the following:~~

~~A. 200 AFY during the construction of either Ivanpah 1 or 2; and 250 AFY for all construction.~~ Groundwater use for operations activities shall not exceed 100 acre-feet per year. Prior to the use of groundwater for construction, the project owner shall install and maintain metering devices as part of the water supply and distribution system to document project water use and to monitor and record in gallons per day the total volume(s) of water supplied to the project from this water source. The metering devices shall be operational for the life of the project.

Verification: Beginning six (6) months after the start of construction, the project owner shall prepare a semi-annual summary of amount of water used for construction purposes. The summary shall include the monthly range and monthly average of daily water usage in gallons per day.

At least sixty (60) days prior to the start of construction of the proposed project, the project owner shall submit to both BLM's Authorized Officer and the CPM a copy of evidence that metering devices have been installed and are operational.

The project owner shall prepare an annual summary, which will include daily usage, monthly range and monthly average of daily water usage in gallons per day, and total water used on a monthly and annual basis in acre-feet. For years subsequent to the initial year of operation, the annual summary will also include the yearly range and yearly average water use by source. For calculating the total water use, the term "year" will correspond to the date established for the annual compliance report submittal.

STORM WATER DAMAGE MONITORING AND RESPONSE PLAN

SOIL&WATER-5: The project owner shall ensure that all the heliostats are designed and installed to withstand storm water scour of up to 6.5 feet or greater that may occur as a result of a 100-year storm event. The analysis of the storm event and resulting heliostat stability will be provided within a Pylon Insertion Depth and Heliostat Stability Report to be completed by the applicant. This analysis will incorporate results from site-specific geotechnical stability testing, as well as hydrologic and hydraulic stormwater modeling performed by the applicant. The modeling will be completed using methodology and assumptions approved by the CPM and BLM's Authorized Officer.

The project owner shall also develop a Storm Water Damage Monitoring and Response Plan to evaluate potential impacts from storm water, including heliostats that fail due to storm water flow or otherwise break and scatter mirror debris on to the ground surface.

Verification: The basis for determination of pylon embedment depths shall employ a step-by-step process as identified below and approved by both the BLM's Authorized Officer and the CPM: The basis for determination of total (local, general and long-term) scour depth will be to employ the step-by-step process identified below with the following criteria:

- A. Determination of peak storm water flow within each sub-watershed from a 100-year event:
- Use of San Bernardino County (SBC) Hydrology Manual to specify hydrologic parameters to use in calculations; and
 - HEC -1 and Flo-2D models will be developed to calculate storm flows from the mountain watersheds upstream of the project site, and flood flows at the project site, based upon hydrologic parameters from SBC. Hydrologic parameters from SBC will be used to develop HEC-1 and Flo-2D hydrologic models.
- B. Determination of potential total pylon scour depth: ~~To determine potential channel erosion and flow velocity from peak storm water flow as determined in A above:~~
- Potential channel erosion depths will be determined using the calculated design flows, as determined in A above, combined with the methodology presented in “FAN, An Alluvial Fan Flooding Computer Program, FEMA, 1990.”
 - Potential local scour will be determined using the calculated design flows, as determined in A above, combined with the Federal Highway Administration (FHWA) equation for local bridge pier scour from the FHWA 2001 report, “Evaluating Scour at Bridges.”
 - ~~using methodology and assumptions subject to approval by BLM’s Authorized Officer and the CPM;~~
- C. The results of the scour depth calculations and pylon stability testing will be used to determine the minimum necessary pylon embedment depth within the active portions of the alluvial fans. In the inactive portions of the alluvial fans that are not subject to channel erosion and local scour, the minimum pylon embedment depths will be based on the results of the pylon stability testing. Active versus inactive areas of the alluvial fans will be determined from the USGS 2006 Open-File Report “Preliminary Surficial Geologic Map of the Mesquite Lake 30’ x 60’ Quadrangle, California and Nevada” authored by Schmidt and McMackin and field observations. To determine potential local scour from peak storm water flow as determined in A above:
- ~~Use Federal Highway Administration (FHA) equation for local bridge pier scour from the FHA 2001 report, “Evaluation Scour at Bridge.”~~
- D. The results of the calculated peak storm water flows and channel erosion and heliostat scour analysis together with the recommended heliostat installation depths shall be submitted to the BLM’s authorized officer and CPM for review and approval sixty (60) days before the start of heliostat installation.

Total scour at a pylon is the total of the results from equations applied in B and C above. To improve local accuracy, the project owner shall apply the engineering process above in Steps A through C in zones on the site to be defined as follows:

- _____ Zone 1: Ivanpah 1
- _____ Zone 2: Ivanpah 2
- _____ Zone 3 Ivanpah 3 South
- _____ Zone 4 Ivanpah 3 North

The Storm Water Damage Monitoring and Response Plan shall be submitted to both the BLM's authorized office and CPM for review and approval and shall include the following elements:

- Detailed maps showing the installed location of all heliostats within each project phase;
- Description of the method of removing all soil spoils should any be generated;
- Each heliostat should be identified by a unique ID number marked to show initial ground surface at its base, and the depth of the pylon below ground;
- Minimum Depth Stability Threshold to be maintained of pylons to meet long-term stability for applicable wind, water and debris loading effects;
- Above and below ground construction details of a typical installed heliostat;
- BMPs to be employed to minimize the potential impact of broken mirrors to soil resources;
- Methods and response time of mirror cleanup and measures that may be used to mitigate further impact to soil resources from broken mirror fragments; and
- Monitoring, documenting, and restoring the Ivanpah playa surface when impacted by sedimentation or broken mirror shards.

A plan to monitor and inspect periodically, before first seasonal and after every storm event:

- Security and Tortoise Exclusion Fence: Inspect for damage and buildup of sediment or debris
- Heliostats within Drainages or subject to drainage overflow: Inspect for tilting, mirror damage, depth of scour compared to pylon depth below ground and the Minimum Depth Stability Threshold, collapse, and downstream transport.
- Drainage Channels: Inspect for substantial migration or changes in depth, and transport of broken glass.
- Constructed Diversion Channels: Inspect for scour and structural integrity issues caused by erosion, and for sediment and debris buildup.
- Ivanpah Playa Surface: Inspect for changes in the surface texture and quality from sediment buildup, erosion, or broken glass.

Short-Term Incident-Based Response:

- Security and Tortoise Exclusion Fence: repair damage, and remove built-up of sediment and debris.
- Heliostats: Remove broken glass, damaged structure, and wiring from the ground, and for pylons no longer meeting the Minimum Depth Stability Threshold, either replace/reinforce or remove the mirrors to avoid exposure for broken glass.
- Drainage Channels: no short-term response necessary unless changes indicate risk to facility structures.
- Constructed Diversion Channels: repair damage, maintain erosion control measures and remove built-up sediment and debris.

Long-Term Design-Based Response:

- Propose operation/BMP modifications to address ongoing issues. Include proposed changes to monitoring and response procedures, frequency, or standards.
- Replace/reinforce pylons no longer meeting the Minimum Depth Stability Threshold or remove the mirrors to avoid exposure for broken glass.
- Propose design modifications to address ongoing issues. This may include construction of active storm water management diversion channels and/or detention ponds.
- Inspection, short-term incident response, and long-term design-based response may include activities both inside and outside of the approved right-of-way. For activities outside of the approved right-of-way, the applicant will notify BLM and acquire environmental review and approval before field activities begin.

At least sixty (60) days prior to construction, the project owner shall submit to both BLM's Authorized Officer and the CPM a copy of the Pylon Insertion Depth and Heliostat Stability Report for review and approval prior to construction. At least sixty (60) days prior to commercial operation, the project owner shall submit to both BLM's Authorized Officer and the CPM a copy of the Storm Water Damage Monitoring and Response Plan for review and approval prior to commercial operation. The project owner shall retain a copy of this plan onsite at the power plant at all times. The project owner shall prepare an annual summary of the number of heliostats failed, cause of the failure, and cleanup and mitigation performed for each failed heliostat.

Traffic and Transportation

VERIFICATION OF POWER TOWER RECEIVER LUMINANCE AND MONITORING

TRANS-4 The project owner shall prepare a Power Tower Luminance Monitoring Plan to provide procedures to conduct periodic monitoring and to document, investigate and resolve complaints regarding distraction effects to aviation, vehicular and pedestrian traffic associated with the power towers.

~~Upon commercial operation of each of the three ISEGS power plants (Ivanpah 1, 2 and 3) and at intervals of every 5 years thereafter, the project owner shall evaluate the intensity of luminance of light reflected from all four sides (north, south, east and west) of the power tower receivers, as measured from the power plant boundary, nearest road and at distances of 200, 500, 1,000 and 1,500 meters from the power tower receivers for each power tower. The measurements are to ensure that luminance does not exceed the standard of 89 cd/m² at the nearest road or power plant boundary.~~

~~The project owner shall measure solar radiation and luminance with an illuminance meter, photometer, or similar device.~~

~~If luminance is identified to be above 89 cd/m² at any power plant boundary or nearest road location, the project owner shall propose mitigation measures for review by BLM's Authorized Officer and the CPM, and upon receiving both approvals, shall implement project modifications to maintain luminance within the threshold of 89 cd/m² at the nearest road and power plant boundary. The modifications may include surface treatment or material changes to increase absorption and reduce reflectivity of the power tower receivers or operational controls, such as reducing the number of heliostats reflecting toward the power tower receiver that is identified as the source of that light. The project owner shall also prepare a monitoring plan that provides requirements and procedures to document, investigate and resolve complaints regarding glare.~~

Verification: Within 60 days prior to commercial operation of the first ISEGS power plant to become operational, the project owner shall provide a Power Tower Luminance Monitoring Plan applicable for the ISEGS Project for review and approval by BLM's Authorized Officer and the CPM. The plan shall specify procedures to document, investigate and resolve complaints regarding glare, and report these to BLM's Authorized Officer and the CPM within 10 days of receiving a complaint.

The project owner shall evaluate the effects of the intensity of the luminance of light reflected from all four sides (north, south, east and west) of the power tower receivers for the following scenarios:

A. Within 90 days following commercial operation;

B. After the initial 5 years of operation;

- C. If a major design change is implemented that results in an increase of the reflective luminance of the power tower ~~Upon commercial operation of~~ for each of the three ISEGS power plants (Ivanpah 1, 2 and 3); and
- D. After receiving a legitimate complaint regarding a distraction associated with the power towers, ~~and at intervals of every 5 years thereafter~~, the project owner shall evaluate the effects of the intensity of the luminance of light reflected from all four sides (north, south, east and west) of the power tower receivers.

The Power Tower Luminance Monitoring Plan shall include provisions for the following:

1. Coordination of luminance evaluations with the FAA, U.S. Department of the Navy, CalTrans, CHP, and with Clark County Department of Aviation in relation to the proposed Southern Nevada Supplemental Airport;
2. Reporting within 15 30 days after completing any luminance measurements required under this plan; the project owner shall submit a summary report to FAA, U.S. Department of the Navy, CalTrans, CHP and Clark County Department of Aviation for review and comment, and to BLM's Authorized Officer and the CPM for review and approval.
3. Measurement of solar radiation and luminance as measured from at the locations where any distraction effects have been reported and at the locations nearest the power towers from the four sides of the power plant boundaries, and the nearest public roads, which may be substituted for one of the sides of the power tower of each of the three power plants and at distances of 200, 500, 1,000 and 1,500 meters from the north, south, east and west sides of the power tower receivers for each power tower and during the time of day when values would be highest;
4. Measurement of solar radiation and luminance using with an illuminance meter, photometer, or similar device and reporting of data in photometric units; the measurements are intended to provide a relative and quantifiable measure of luminance that can be associated with any observed and reported distraction effect from the power tower receivers that may support anticipation and investigation of any future effects to ensure that luminance does not exceed the standard of 89 cd/m² at the nearest road or power plant boundary.
5. Provisions for identifying and implementing appropriate mitigation measures if reported distraction is determined to be legitimate and if power tower luminance is determined to be causing a safety concern; The project owner shall consider and propose any reasonable mitigation measures that are technically and financially feasible. The mitigation measures may include surface treatment or material changes to increase absorption and reduce reflectivity of the power tower receivers, road signage, screening or other reasonable measures.

6. Post-mitigation verification; Within 30 days following the implementation of mitigation measures designed to reduce reflectivity of the power towers, the project owner shall repeat the luminance measurements to demonstrate the effectiveness of mitigation measures and prepare a supplemental survey report for review and comment by FAA, U.S. Department of the Navy, CalTrans, CHP and Clark County Department of Aviation, and for review and approval by BLM's Authorized Officer and the CPM.

~~If luminance is identified to be above 89 cd/m^2 at any power plant boundary or nearest road location, the project owner shall propose mitigation measures for review and approval by BLM's Authorized Officer and the CPM., and Upon receiving both approvals, the project owner shall implement mitigation measures project modifications to reduce the level of distraction associated with glare from the power tower receivers maintain luminance within the threshold of 89 cd/m^2 at the nearest road and power plant boundary. The modifications may include surface treatment or material changes to increase absorption and reduce reflectivity of the power tower receivers or operational controls, such as reducing the number of heliostats reflecting toward the power tower receiver that is identified as the source of that light. The project owner shall also prepare a monitoring plan that provides requirements and procedures to document, investigate and resolve complaints regarding glare.~~

~~Within 30 days following commercial operation of each of the three ISEGS power plants (Ivanpah 1, 2 and 3) during peak load conditions (95% or greater of the power plant rated capacity) and at intervals of every 5 years thereafter, the project owner shall conduct luminance measurements as follows:~~

- ~~1. The luminance measurement shall be conducted for all four sides (north, south, east and west) of the power tower receivers, as measured from the power plant boundary, nearest road and at distances of 200, 500, 1,000 and 1,500 meters from the power tower receivers for each power tower.~~
- ~~2. Within 15 days after completing each of the surveys, the project owner shall submit a summary report of the survey to FAA, U.S. Department of the Navy, CalTrans, and Clark County Department of Aviation for review and comment, and to BLM's Authorized Officer and the CPM for review and approval.~~
- ~~3. If the measurements reveal that luminance exceeds 89 cd/m^2 at any of the nearest roads and power plant boundaries to each north, south, east and west face of each power tower, the survey report shall include a description of proposed mitigation measures necessary to achieve compliance, and the project owner shall also propose a schedule, subject to BLM Authorized Office and CPM approval, for implementing those measures.~~
- ~~4. Within 30 days following the implementation of the mitigation measures, the project owner shall repeat the luminance measurements and prepare a supplemental survey report for review and comment to FAA, U.S. Department of the Navy, CalTrans, and Clark County Department of Aviation, and for review and approval by BLM's Authorized Officer and the CPM.~~

~~5. This process would be repeated as necessary until the project complies with the luminance limit of not exceeding 89 cd/m^2 at any of the nearest roads and power plant boundaries to each north, south, east and west face of each power tower.~~

~~The field measurements and verification process are to be repeated at five-year intervals following commercial operation for the life of the project as applicable to each of the three ISEGS power plants.~~

~~The five-year field measurement and verification process and investigation of any complaints related to glare shall be coordinated with the FAA, U.S. Department of the Navy, CalTrans, and Clark County Department of Aviation as applicable, and shall document, address and satisfactorily resolve any complaints as determined by BLM's Authorized Officer and the CPM.~~

~~The project owner shall prepare a monitoring plan that provides requirements and procedures to document, investigate and resolve complaints regarding glare, and report these to BLM's Authorized Officer and the CPM within 10 days of receiving a complaint, as part of the Annual Compliance Report, and as part of the Five-Year Field Measurement and Verification Report.~~



**BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
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APPLICATION FOR CERTIFICATION
FOR THE *IVANPAH SOLAR ELECTRIC
GENERATING SYSTEM*

DOCKET No. 07-AFC-5
PROOF OF SERVICE
(Revised 11/23/09)

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DECLARATION OF SERVICE

I Maria Santourdjian, declare that on January 13, 2010, I served and filed copies of the attached, Staff's Proposed COC Exhibit 312. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: [www.energy.ca.gov/sitingcases/ivanpah].

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(Check all that Apply)

FOR SERVICE TO ALL OTHER PARTIES:

sent electronically to all email addresses on the Proof of Service list;

by personal delivery or by depositing in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses NOT marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (*preferred method*);

OR

depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION

Attn: Docket No. 07-AFC-5
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I declare under penalty of perjury that the foregoing is true and correct.

Original Signature in Dockets
Maria Santoudjian