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LETTER OF TRANSMITTAL

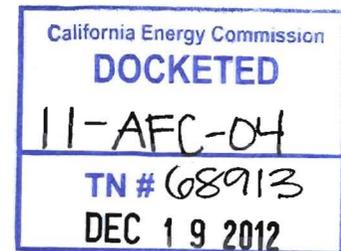
TO: CEC Dockets

DATE: December 17, 2012

SUBJECT: Rio Mesa Solar (11-AFC-04) - Applicant's Comments on Preliminary Staff Assessment

Enclosed please find the following: One (1) CD copy of Applicant's Comments on Preliminary Staff Assessment – Volume 1, one (1) CD copy of Applicant's Comments on Preliminary Staff Assessment – Volume 2 and one (1) hard copy of the Declaration of Service with original signature.

- For:**
- Review and Approval
 - Signature and Return
 - Appropriate Action
 - As Requested
 - For Your Information



Remarks: Enclosed for your reference is Applicant's Comments on Preliminary Staff Assessment – Volumes 1 and 2. It has come to our attention that CDs previously transmitted on November 19th, 2012 were inadvertently missing Appendix Soil and Surface Water 1, containing the DESC and SWPPP. Please use the enclosed CDs to replace those previously sent. We apologize for the inconvenience.



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

**APPLICATION FOR CERTIFICATION FOR THE
RIO MESA SOLAR ELECTRIC
GENERATING FACILITY**

DOCKET NO. 11-AFC-04
PROOF OF SERVICE
(Revised 11/2/12)

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Jennifer Jennings
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DECLARATION OF SERVICE

I, Nick Jacobs, declare that on December 17th, 2012, I served and filed a copy of the attached document, Applicant's Comments on Preliminary Staff Assessment, dated November 19th, 2012. This document is accompanied by the most recent Proof of Service list, located on the web page for this project at:

<http://www.energy.ca.gov/sitingcases/riomesa/index.html>.

The document has been sent to the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit or Chief Counsel, as appropriate, in the following manner:

(Check all that Apply)

For service to all other parties:

- Served electronically to all e-mail addresses on the Proof of Service list;
- Served by delivering on this date, either personally, or for mailing with the U.S. Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses marked **"hard copy required"** or where no e-mail address is provided.

AND

For filing with the Docket Unit at the Energy Commission:

- by sending electronic copies to the e-mail address below (preferred method); **OR**
- by depositing an original and 12 paper copies in the mail with the U.S. Postal Service with first class postage thereon fully prepaid, as follows:

CALIFORNIA ENERGY COMMISSION – DOCKET UNIT

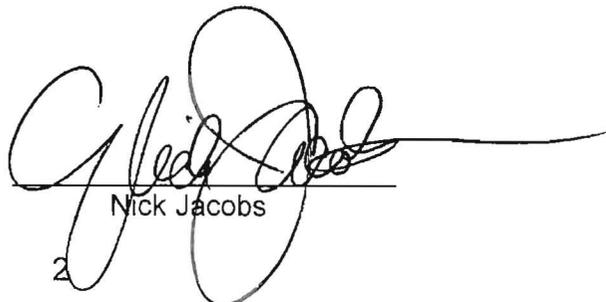
Attn: Docket No. 11-AFC-04
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.ca.gov

OR, if filing a Petition for Reconsideration of Decision or Order pursuant to Title 20, § 1720:

- Served by delivering on this date one electronic copy by e-mail, and an original paper copy to the Chief Counsel at the following address, either personally, or for mailing with the U.S. Postal Service with first class postage thereon fully prepaid:

California Energy Commission
Michael J. Levy, Chief Counsel
1516 Ninth Street MS-14
Sacramento, CA 95814
michael.levy@energy.ca.gov

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.



Nick Jacobs

*indicates change



BrightSource

Applicant's Comments on Preliminary Staff Assessment

Volume 1: General Comments and Comments to Conditions of Certification

(11-AFC-04)



Submitted to:



CALIFORNIA ENERGY COMMISSION
1516 9th Street, MS15
Sacramento, CA 95814-5504

Submitted by:

RIO MESA SOLAR I, LLC
RIO MESA SOLAR II, LLC
1999 Harrison Street, Suite 2150
Oakland, CA 94612

NOVEMBER 19, 2012



BrightSource

November 19, 2012

Mr. Pierre Martinez
California Energy Commission
1516 Ninth Street, MS-2000
Sacramento, CA 95814

Subject: Applicant's Comments on the Preliminary Staff Assessment
Rio Mesa Solar Electric Generating Facility (11-AFC-4)

Dear Mr. Martinez,

On behalf of the Applicant (Rio Mesa Solar I, LLC and Rio Mesa II, LLC), please find the attached comments on the Preliminary Staff Assessment (PSA), for both Parts A and B. One hard copy as well as one CD is provided for docketing. Please note for ease of review we have separated our responses into two volumes:

Volume 1: General Comments including comments to the proposed Conditions of Certification

Volume 2: Specific Comments.

For Staff's convenience, all changes to PSA text, including any changes to the proposed Conditions of Certification, are shown in underline/strikeout format.

Although we disagree with aspects of the PSA analysis, most of the proposed Conditions of Certification are reasonable. Thus, we are optimistic that any disagreement will be bridged through further discussion with Staff, narrowing the range of issues taken to evidentiary hearings.

Please note that Applicant is still preparing comments on PSA Appendix *TTI*, Glint and Glare Safety Impact Assessment. This will be submitted as soon as possible. In addition, Appendix *Cultural Resources 1* will be provided under confidential cover, anticipated November 20, 2012.

Applicant looks forward to working collaboratively with Staff to address unresolved issues in a cooperative manner. If you have any questions, please do not hesitate to contact me.

Sincerely,

Todd Stewart
Senior Director of Project Development

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

**Applicant's General Comments and Comments to Conditions of Certification
on the Preliminary Staff Assessment**

EXECUTIVE SUMMARY

GENERAL COMMENTS

1. Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC are collectively the “Applicant” for the Rio Mesa Solar Electric Generating Facility. Please remove any reference to BrightSource Energy, Inc. as the Applicant (e.g., Page 1.1-1, first paragraph, second sentence).

Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)
Applicant's General Comments and Comments to Conditions of Certification
on the Preliminary Staff Assessment

PROJECT DESCRIPTION

GENERAL COMMENTS

No general comments. Please see Volume 2 for all comments regarding the Project Description.

FINDINGS OF FACT

No findings of fact listed are listed in the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

No Conditions of Certification are proposed in this section of the PSA.

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

**Applicant's General Comments and Comments to Conditions of Certification
on the Preliminary Staff Assessment**

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GENERAL COMMENTS

No general comments.

FINDINGS OF FACT

No findings of fact listed are listed in the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

1. **Page 4.1-43, AQ-SC3:** Applicant requests the following changes to this condition to clarify the dust mitigation techniques expected to be used during construction of the Project:

AQ-SC3 Construction Fugitive Dust Control: The AQCM shall submit documentation to the CPM in each Monthly Compliance Report (MCR) that demonstrates compliance with the following mitigation measures for the purposes of preventing all fugitive dust plumes from leaving the project boundary. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

- A. The main access roads through the facility to the power block areas will be ~~paved~~ watered, or otherwise treated with a CEC-approved soil weighting agent until they are paved during prior to initiating construction in the main power block area, and delivery areas for operations materials (chemicals, replacement parts, etc.) will be paved prior to taking initial deliveries.
- B. All unpaved construction roads and unpaved operational site roads, as they are being constructed, shall be stabilized with a non-toxic soil stabilizer, water, or other soil weighting agent that can be determined to be at least ~~both~~ as efficient ~~or more efficient~~ for fugitive dust control as Air Resources Board (ARB)-approved soil stabilizers, and shall not increase any other environmental impacts including loss of vegetation. All other disturbed areas in the project and linear construction sites shall be watered as frequently as necessary during grading and stabilized with a non-toxic soil stabilizer or soil weighting agent to comply with the dust mitigation objectives of Condition of Certification AQ-SC4. The frequency of watering can be reduced or eliminated during periods of precipitation.
- C. Unless approved by the CPM, ~~No~~ vehicle shall exceed 10 miles per hour on unpaved areas within the construction site, with the exception that

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- vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.
- D. Visible speed limit signs shall be posted at the construction site entrances and along traveled routes.
 - E. All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering offsite paved roadways.
 - F. Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.
 - G. All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.
 - H. All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the CPM.
 - I. Construction areas adjacent to any paved roadway below grade of the surrounding construction area or otherwise directly impacted from site drainage shall be provided with sandbags or other equivalently effective measures to prevent run-off to roadways, or other similar run-off control measures as specified in the Storm Water Pollution Prevention Plan (SWPPP), only when such SWPPP measures are necessary so that this condition does not conflict with the requirements of the SWPPP.
 - J. All paved roads within the construction site shall be swept ~~at least twice daily (or less during periods of precipitation)~~ or as often as necessary on days when construction activity occurs to prevent the accumulation of dirt and debris.
 - K. At least the first 500 feet of any paved public roadway exiting the construction site or exiting other unpaved roads en route from the construction site or construction staging areas shall be swept ~~at least twice daily (or less during periods of precipitation)~~ or as often as necessary on days when construction activity occurs or on any other day when dirt or runoff resulting from the construction site activities is visible on the public paved roadways.
 - L. All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered, or shall be treated with water or appropriate dust suppressant compounds.
 - M. All vehicles used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least one foot of freeboard.
 - N. Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

Verification: The AQCOMM shall provide to the CPM in the MCR:

- A. a summary of all actions taken to maintain compliance with this condition;

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- B. copies of any complaints filed with the district and subsequently provided to the project owner in relation to project construction; and
 - C. any other documentation reasonably deemed necessary by the CPM, and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.
2. **Page 4.1-45, AQ-SC4:** Applicant requests the following changes to this condition for clarification purposes and in recognition of the large site:

AQ-SC4 Dust Plume Response Requirement: The AQCMM shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported: (A) off the project site and within 400 feet upwind of any regularly occupied structures not owned by the project owner, or (B) 200 feet beyond the centerline of the construction of linear facilities indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMP shall include a section detailing how the ~~additional~~ augmented mitigation measures will be accomplished within the time limits specified in Steps 1 through 3, below. The AQCMM ~~or Delegate~~ shall implement the following procedures for ~~additional~~ augmented mitigation measures in the event that such visible dust plumes are observed:

Verification: The AQCMP shall include a section detailing how the augmented measures will be accomplished within the time limits specified in Steps 1 through 3, below. The AQCMM or Delegate shall implement the following procedures for augmented mitigation measures in the event that such visible dust plumes are observed:

- Step 1: The AQCMM shall direct more intensive application of the existing mitigation methods ~~within~~ as quickly as feasible but not more than 1530 minutes of ~~after~~ making such a determination.
- Step 2: The AQCMM shall direct implementation of additional methods of dust suppression if Step 1, specified above, fails to result in adequate mitigation ~~within~~ as quickly as feasible but not more than 3060 minutes of ~~after~~ the original determination.
- Step 3: The AQCMM shall direct a temporary shutdown of the activity causing the emissions if Step 2, specified above, fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The owner/operator may appeal to the CPM any directive from the AQCMM to shut down an activity, if the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

Verification: The AQCMM shall provide to the CPM in the MCR:

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- A. a summary of all actions taken to maintain compliance with this condition;
 - B. copies of any complaints filed with the District and provided to the project owner in relation to project construction; and
 - C. any other documentation reasonably deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.
3. **Page 4.1-45, AQ-SC5:** Applicant requests that the standard idling condition be added to this condition. In addition, Applicant requests the following changes to this condition for clarification purposes:

AQ-SC5 Diesel-Fueled Engine Control: The AQCMM shall submit to the CPM, in the MCR, a table that demonstrates compliance with the AQCMP mitigation measures for purposes of controlling diesel construction-related combustion emissions. Any deviation from the AQCMP mitigation measures requires prior CPM notification and approval.

Verification: All off-road diesel construction equipment with a rating of 50 hp or greater used in the construction of this facility ~~shall be powered by the cleanest engines available that also~~ shall comply with the California Air Resources Board's (ARB's) Regulation for In-Use Off-Road Diesel Fleets (California Code of Federal Regulations Title 13, Article 4.8, Chapter 9, Section 2449 et.seq.) and shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by **AQ-SC2**. The AQCMP measures shall include the following, with the lowest-emitting engine chosen in each case, as available:

- a. All off-road vehicles with compression ignition engines shall comply with the California Air Resources Board's (ARB's) Regulation for In-Use Off-Road Diesel Fleets.
- b. To meet the highest level of emissions reduction available for the engine family of the equipment, each piece of diesel-powered equipment shall be powered by a Tier 4 engine (without add-on controls) or Tier 4i engine (without add-on controls), or a Tier 3 engine with a post-combustion retrofit device verified for use on the particular engine powering the device by the ARB or the U.S. EPA. For PM, the retrofit device shall be a particulate filter if verified, or a flow-through filter, or at least an oxidation catalyst. For NOx, the device shall meet the latest Mark level verified to be available (as of January 2012, none meet this NOx requirement).
- c. For diesel powered equipment where the requirements of Part "b" cannot be met, the equipment shall be equipped with a Tier 3 engine without retrofit control devices or with a Tier 2 or lower Tier engine using retrofit controls verified by ARB or U.S. EPA as the best available control device to reduce exhaust emissions of PM and nitrogen oxides (NOx) unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of

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such devices can be considered “not practical” for the following, as well as other, reasons:

1. There is no available retrofit control device that has been verified by either the California Air Resources Board or U.S. EPA to control the engine in question and the highest level of available control using retrofit or Tier 1 engines is being used for the engine in question; or
 2. The use of the retrofit device would unduly restrict the vision of the operator such that the vehicle would be unsafe to operate because the device would impair the operator’s vision to the front, sides, or rear of the vehicle, or
 3. The construction equipment is intended to be on site for 10 work days or less.
- d. The CPM may grant relief from a requirement in Part “b” or “c” if the AQCOMM can demonstrate a good faith effort to comply with the requirement and that compliance is not practical.
- e. The use of a retrofit control device may be terminated immediately provided that the CPM is informed within 10 working days following such ~~of the~~ termination; (2) and a replacement for the construction equipment ~~item~~ in question, which meets meeting the level of control required, occurs within 10 work days following such ~~of~~ termination of the use (if the equipment would be needed to continue working at this site for more than 15 work days after the use of the retrofit control device is terminated); and (3) if one of the following conditions exists:
1. The use of the retrofit control device is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power output due to an excessive increase in exhaust back pressure.
 2. The retrofit control device is causing or is reasonably expected to cause engine damage.
 3. The retrofit control device is causing or is reasonably expected to cause a substantial risk to workers or the public.
 4. Any other seriously detrimental cause which has the approval of the CPM prior to implementation of the termination, which approval shall not be unreasonably withheld.
- f. All equipment with engines meeting the requirements above shall be properly maintained and the engines tuned to the engine manufacturer’s specifications. ~~Each engine shall be in its original configuration and the~~

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equipment or engine must be replaced if it exceeds the manufacturer's approved oil consumption rate.

- g. Construction equipment will employ electric motors when feasible.
- h. If the requirements detailed above cannot be met, the AQCMM shall certify that a good faith effort was made to meet these requirements and this determination must be approved by the CPM, which approval shall not be unreasonably withheld.
- i. All off-road diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.
- j. All diesel heavy construction equipment shall not idle for more than 5 minutes. Vehicles that need to idle as part of their normal operation (such as concrete trucks) are exempt from this requirement.

Verification: The AQCMM shall include in the MCR the following information to demonstrate control of diesel construction-related emissions:

- A. A summary of all actions taken to control diesel construction related emissions;
 - B. A table listing all heavy equipment used on site during that month, showing the tier level of each engine and the basis for alternative compliance with this condition for each engine not meeting Part "b" requirements. The MCR shall identify the owner of the equipment and contain a letter from each owner indicating that the equipment has been properly maintained; and
 - C. Any other documentation reasonably deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.
4. **Page 4.1-48, AQ-SC6:** Because Applicant has specified that some MWMs will be equipped with non-road engines, reference to "non-road" vehicles has been inserted into this condition. Applicant requests the following changes:

AQ-SC6 The project owner, when obtaining dedicated vehicles for mirror washing activities and other facility maintenance activities, shall only obtain new model year vehicles equipped with engines that meet California on-road or off-road vehicle emission standards for the ~~model~~ year when obtained.

Other vehicle/fuel types may be allowed assuming that the emission profile for those vehicles, including fugitive dust generation emissions, is comparable to the vehicles types identified in this condition.

Verification: At least 60 days prior to the start of commercial operation, the project owner shall submit to the CPM a plan that identifies the size and type of the on-site

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vehicle and equipment fleet and the vehicle and equipment purchase orders and contracts and/or purchase schedule. The plan shall be updated every other year and submitted in the Annual Compliance Report.

5. **Page 4.1-48, AQ-SC7:** Applicant requests the following changes to this condition for clarification purposes:

- AQ-SC7** The project owner shall provide a site operations dust control plan, including all applicable fugitive dust control measures identified in **AQ-SC3** that would be applicable to reducing fugitive dust from ongoing operations; that:
- A. describes the active operations and wind erosion control techniques such as windbreaks and chemical dust suppressants, including their ongoing maintenance procedures, that shall be used on areas that could be disturbed by vehicles or wind anywhere within the project boundaries; and
 - B. identifies the location of signs throughout the facility that will limit traveling on unpaved surfaces to solar equipment maintenance vehicles only. In addition, vehicle speed shall be limited to no more than 10 miles per hour on these unpaved surfaces, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved surfaces as long as such speeds do not create visible dust emissions.

Verification: The site operations fugitive dust control plan shall include the use of durable non-toxic soil stabilizers or water, on all regularly used unpaved surfaces and disturbed off-road areas within the project boundaries, and shall include the inspection and maintenance procedures that will be undertaken to ensure that the unpaved surfaces remain stabilized. The soil stabilizer used shall be a non-toxic soil stabilizer, water, or other soil weighting agent that can be determined to be ~~both~~ as efficient ~~or more efficient~~ for fugitive dust control as ARB approved soil stabilizers, and shall not increase any other environmental impacts including loss of vegetation.

The fugitive dust controls shall meet the performance requirements of condition **AQ-SC4**. The performance requirements of **AQ-SC4** shall also be included in the operations dust control plan.

Verification: At least 60 days prior to start of commercial operation, the project owner shall submit to the CPM for review and approval a copy of the plan that identifies the dust and erosion control procedures, including effectiveness and environmental data for the proposed soil stabilizer, that will be used during operation of the project and that identifies all locations of the speed limit signs. At least 60 days after the beginning of commercial operation, the project owner shall provide to the CPM a report identifying the locations of all speed limit signs, and a copy of the project employee and contractor training material that clearly identifies that project employees and contractors are required to comply with the dust and erosion control procedures and on-site speed limits.

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6. **Page 4.1-49, AQ-SC9:** This condition appears to be duplicative of AQ-24, AQ-30, AQ-31, and AQ-36 with respect to installing emergency generator and fire pump engines certified to EPA non-road engine emission standards and compliant with applicable NSPS Subpart IIII requirements. Therefore Applicant requests the removal of this condition.

AQ-SC9 ~~The emergency generator and fire pump engines procured for this project will meet or exceed the NSPS Subpart IIII emission standards for the model year that corresponds to their date of purchase.~~

Verification: ~~The project owner shall submit the emergency engine specifications to the CPM at least 30 days prior to purchasing the engines for review and approval.~~

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

**Applicant's General Comments and Comments to Conditions of Certification
on the Preliminary Staff Assessment**

BIOLOGICAL RESOURCES

GENERAL COMMENTS

Due to the length and number of topics in the Biological Resources section of the PSA, Applicant's General Comments have been organized by subject area. The Specific Comments contained in Volume 2 of the Applicant's PSA Comments refer to Applicant's General Comments where applicable to explain the reasons for the recommended text changes identified in that section.

General Comments on LORS Compliance Issues Related to the Federal Migratory Bird Treaty Act, California Fish and Game Code Sections 3503.5 and 3513, Impact Uncertainty, and Compensatory Mitigation for Unknown Impacts:

1. The PSA departs from prior CEC practice and applicable law by suggesting that, unlike all prior CEC assessments of solar reflective technology reviewed by Applicant (see summary below), the proposed project's impacts generate LORS compliance issues and significant unmitigable impacts to avian species. The CEC presents no new information to support this position. The PSA's statements regarding mirrored heliostat and solar flux risks appear to comprise the most substantial issues for CEC staff, but they conflict with empirically-validated research data from other operating facilities (General Comments 26 through 29). Applicant has provided staff with two recent avian impact studies from Torresol's GEMASolar Project in Southern Spain, and the initial interim avian impact study conducted by Bio-Logic and the Society for the Protection of Nature in Israel at BrightSource's SEDC facility, each of which documented no avian fatalities that could be attributed to any of the collision or solar flux impact risks identified in the PSA. The FSA should incorporate this information into its analysis. The PSA has not addressed empirical data developed from rigorous, scientifically-valid tests at the Israel facility, demonstrating that avian temperature responses to solar flux are orders of magnitude lower than the speculative projections in the PSA. The studies also demonstrated that any potential flux-related avian effects would be confined to an insignificant portion (less than 0.04%) of the facility airspace and located near the top of the central towers where operational noise, lack of habitat, and perch and nest proofing would substantially discourage any avian activity. Consistent with prior CEC assessments, the PSA acknowledges that the nature, extent, and magnitude of any avian impact risk that might be associated with new solar reflective technologies, cannot be estimated or calculated with certainty at this time. In marked contrast with these previous precedents, the PSA concludes that unknown potential impacts can be determined to be significant without substantial evidence.
2. The PSA further concludes that adaptive management measures implemented in all prior CEC assessments of solar reflective technology to evaluate and respond to substantially similar unknown, potential impacts will be uniquely ineffective for the proposed project. Additionally, it determines that no feasible methods can be identified to mitigate for unknown, potential impacts, but nevertheless includes new impact compensation requirements, including regional power pole retrofitting, to mitigate for these unknown, potential impacts. In every prior analysis of solar reflective and similar renewable energy technologies that are being developed

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in response to critically important state and federal low-carbon energy policies, the CEC has concluded that, notwithstanding avian impact uncertainties, the implementation of: (i) feasible avoidance and minimization measures; (ii) an avian mortality monitoring and protection plan; and (iii) an adaptive management program, will reduce potential avian impacts to less than significant levels and comply with all LORS. The PSA should be revised in a manner that is consistent with prior CEC certifications of similar technology.

3. The PSA concludes that the project, alone among all other solar reflective renewable energy facilities previously approved by the CEC, will not comply with several avian-related LORS. The PSA, however, explicitly concedes that: (a) "Due to the many factors contributing to bird collision risk, staff cannot quantify expected bird mortalities from collision with project facilities" and (b) "Due to the many factors contributing to bird collision risk [*sic*; correct reference should be to "radiant energy flux risk"], staff cannot quantify expected bird mortalities from radiant energy flux." (Cite new Section) The FSA should conclude that the project will comply with avian-related LORS with the implementation of the conditions of certification, as it did for previous projects.
4. The PSA characterizes impacts from flux and collisions as speculative and unquantifiable, and then concludes that the impacts cannot be mitigated "below a level of significance." PSA, pp. 4.2-87 through 4.2-88. As discussed more fully below, evaluating impacts on the basis of pure speculation is impermissible under CEQA, and the PSA should be revised to comply with CEQA.

The staff approach to the project is inconsistent with its previous decisions on similar projects as well as the U.S. Bureau of Land Management ("BLM") assessment of the Crescent Dunes Solar Energy Project, a solar tower facility with substantially similar potential avian impacts located near Tonopah, Nevada (approved in December 2010). In each case, the CEC and BLM concluded that: (a) potential avian impacts could occur but cannot be estimated or characterized with certainty due to the developing nature of the technology; (b) certain avoidance and minimization measures can be implemented to reduce these potential impacts; and (c) an adaptive management approach that includes potential impact monitoring, identification of the causes of any observed impacts, and the identification of methods to mitigate for any such observed impacts will reduce potential avian impacts to less than significant levels. There are no credible reasons for departing from this precedent, and the PSA should be revised to be consistent with the prior methodologies and assessment approaches utilized by the CEC. Examples of CEC and BLM approach to these issues include the following:

- a. The Rice Solar Energy Project ("RSEP") includes a solar tower facility that, for purposes of avian impact analysis, is substantially similar to the proposed project. RSEP was approved by the CEC in late 2010. The CEC staff assessment of the project identified and discussed each of the potential avian impact issues discussed in the PSA, including potential mirrored heliostat and solar flux impacts. Staff characterized avian impacts in a very similar manner to the Rio Mesa PSA. In marked contrast with the Rio Mesa PSA, and consistent with applicable law, the CEC staff acknowledged that, "[g]iven the limited research-based data on these impacts, staff cannot conclude that they are significant" (Rice Final Staff Assessment, pp. 6.2-122) and identified an adaptive management approach to mitigate impacts to less than significant levels and comply with all LORS.

Furthermore, Staff argued "[a]vailable data confirm that avian mortality has resulted from similar, much smaller solar facilities. Staff expects that bird mortality also will result from the proposed RSEP. Given the limited research-based data on these impacts, staff cannot conclude that they are significant. However, due to the potential for significant impacts,

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staff recommends monitoring so that if impacts do occur, they can be evaluated and addressed. In Condition of Certification **BIO-25** (Avian and Bat Protection Plan and Monitoring Operational Impacts of Solar Collection Facility on Birds and Bats), staff recommends that Applicant prepare and implement a formal long-term study to determine the effects of the proposed project on migratory and special status bird species." Rice Final Staff Assessment, p. 6.2-122.

"Environmental impacts for all issue areas would not be significant or would be mitigated to a less than significant level, including impacts to biological resources...." Rice Final Staff Assessment, p. 4-10.

"The conditions of certification described below satisfy the following State LORS and take the place of terms and conditions that, but for the Commission's exclusive authority, would have been included in the following State permits...." Rice Final Staff Assessment, pp. 6.2-151 to 6.2-152, including specific reference to the LORS identified in the PSA.

"With implementation of staff's proposed conditions of certification, construction and operation of the RSEP would comply with all federal, State, and local laws, ordinances, regulations, and standards relating to biological resources. Staff recommends adoption of the following conditions of certification to mitigate potential impacts to sensitive biological resources. As described above (C.2.5.2 Assessment of Impacts and Discussion of Mitigation) staff concludes that these measures would reduce the project's impacts to less than significant levels under CEQA." Rice Final Staff Assessment, p. 6.2-156.

These findings were incorporated into the Rice Final Decision (Final Decision, pp. 55-56) which also determined that the project would comply with all LORS, including specific reference to including specific reference to the LORS identified in the PSA (Final Decision, Appendix A). The potential avian impacts that could be associated with the solar reflective technology utilized in the proposed project are virtually identical with the potential avian impacts identified for the RSEP. There are no credible reasons for departing from CEC precedent for a similarly-situated project. The PSA should be revised to reflect the assessment approach in the RSEP certification process.

- b. In its review of the Abengoa Mojave Solar Project, the CEC stated that "there is no research-based data" supporting a finding that avian mortality due to collisions with mirrors would be significant despite a finding that a nearby lake bed "supports thousands of birds during the spring months." Abengoa Final Decision, p. 255. Avian collision impact risks potentially associated with solar reflective surfaces were characterized as "unknown" by the CEC staff. The staff analysis concluded that avoidance, minimization and adaptive management conditions of certification would result in impacts that were "likely less than significant." Abengoa Supp. Staff Assessment, Part B, p. 5.2-62.
- c. The CEC staff assessment of the Blythe Solar Power Project observed that "[s]olar facilities present a new and relatively unresearched risk for bird collisions and other injuries" and that avian responses "to glare from the proposed solar trough technology is not well understood." The assessment further stated that, "diurnal birds could also be at risk of injury and fatality from burns if they flew into the reflected sunlight between parabolic troughs or landed on the collector tubes of heat transfer fluid." Notwithstanding these potential risks, and the CEC staff's belief that "there is insufficient information available to conclude with certainty that the Blythe Project would not be an ongoing source of mortality to birds for the life of the Project," the assessment concluded that an adaptive management

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- COC “would provide the information needed to determine if operation of the Project posed a collision risk for birds, and would provide adaptive management measures to mitigate those impacts to less than significant levels.” Blythe Revised Staff Assessment, pp. C.2-79 through C.2-80. The Blythe Final Decision similarly found that “implementation of the [COCs] would reduce potential project-related direct and indirect impacts to migratory/special-status bird species to less than significant levels.” Blythe Final Decision, pp. 232-233 and 224.
- d. The Calico Solar Project Final Staff Assessment stated that “[s]olar facilities, including large scale complexes such as the 6,215 acre Calico Solar facility, present a new and relatively un-researched risk for bird collisions and other injuries.” CEC staff also stated that “SunCatchers at the Calico Solar Project plant site would pose a collision risk to birds,” and concluded that “it is probable that birds will collide with the structures.” The staff assessment identified approximately 12 to 15 new 220 kV transmission line structures approximately 90 to 110 feet tall as additional potential avian collision risks. Notwithstanding these observations, the CEC staff assessment conceded that, “[t]here is insufficient information available to conclude whether the Calico Solar Project would be a significant ongoing source of mortality to birds for the life of the project.” Consistent with all CEC assessments of solar reflective technology reviewed by Applicant, the staff recommended an adaptive management approach for reducing potential, but uncertain impacts to less than significant levels: “Given the lack of research-based data on the impacts of glare and collision threats to birds, staff’s proposed Condition of Certification BIO-22 (Avian Protection Plan / Monitoring Bird Impacts from Solar Technology), would provide the information needed to develop and implement adaptive management measures to mitigate bird collision impacts. If the SunCatchers pose a collision risk for birds, the applicant shall be required to implement measures such as construction of bird diverters, aerial markers, or other units to minimize potential collision risks for birds. Staff concludes that the Avian Protection Plan and bird impact monitoring as recommended in Condition of Certification BIO-22 would effectively determine rates of bird collisions with project facilities and would result in implementation of further feasible measures as needed to mitigate significant bird collisions, if they should occur, below a level of significance.” Calico Final Staff Assessment, pp. C.2-107 to 108.
- e. The Palen Solar Power Project (original configuration) review process included comments by the Center for Biological Diversity (“CBD”) asserting, among other concerns, that the CEC failed to adequately consider potential mirrored surface impacts to birds. The CEC staff responded by rejecting the notion that mirrored surface impact data from other sources was relevant, and that pre-construction avian surveys would characterize post-development avian occurrence and impact potential: “Staff does not agree with CBD’s assertion that bird collision data from power lines or other reflective surfaces (e.g., windows) could be extrapolated to solar troughs to provide a quantitative assessment of likely bird collisions. Pre-construction bird surveys would not provide useful data on post-construction bird use of the site, after it is graded and developed, or information as to how many birds might be attracted to netted evaporation ponds surrounded by solar arrays. This issue of bird collisions with solar arrays is, as staff has described in the RSA, a topic where there is little information and much uncertainty. Staff believes that Condition of Certification BIO-16 provides a conservative and protective approach to addressing the uncertainty associated with the potential threat of bird collisions with the Project’s solar arrays, and provides an adaptive management approach for addressing impacts if they occur.” Palen Staff Rebuttal Testimony, pp. 8-9. The CEC final decision concluded that, while “uncertainties exist due to

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- the lack of associated research-based data” regarding the impacts associated with new solar reflective technologies, “Condition of Certification BIO-16 has been identified to address these potential impacts. Specifically, this measure includes a requirement to determine if operation of the Project poses a collision risk for birds, and to provide adaptive management measures to mitigate those impacts to less-than significant levels if applicable.” Palen Final Decision, p. 33.
- f. The Imperial Valley Final Decision found that while extent of collision risks with SunCatchers was unknown, an avian protection plan and adaptive management approach would mitigate such impacts to less than significant levels. Imperial Valley Final Decision, p. 242.
 - g. The BLM’s approval of the Crescent Dunes solar tower facility was also consistent with the CEC decisions discussed above and included an adaptive management approach to address potential, but unknown impacts that could be associated with new solar reflective renewable energy technology. The FEIS for the project addressed CBD comments asserting that the BLM analysis did not sufficiently consider impacts to migratory birds and golden eagles potentially caused by reflected light and heat, collisions or contact with the facility’s evaporative ponds. In response, the BLM stated that “[s]imilar facilities as the proposed project do not currently exist in the U.S.; therefore, no information exists on the impacts to golden eagles, migratory birds, insect, and bats The mitigation and monitoring plans do provide for progressive responses to any change in impacts to migratory birds or other wildlife as a result of increased temperature zones around the central receiver and heliostats, evaporation ponds, or other project-related operations. In addition, the Notice to Proceed for construction would be contingent upon BLM receiving concurrence from USFWS on the proposed Avian and Bat Protection Plan (ABPP). The proposed ABPP is an agreement between [the project] and the USFWS that addresses potential impacts, mitigation measures, and monitoring requirements.” Crescent Dunes FEIS, pp. 47-49.
5. Under CEQA, a lead agency must "provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment." Pub. Res. Code § 21061 (emphasis added). To assess the impact of a proposed project on the environment, the lead agency examines the changes to existing environmental conditions that would occur in the affected area if the proposed project were implemented. 14 Cal. Code Regs. § 15126.2(a); *San Joaquin Raptor Rescue Ctr. v. County of Merced* (2007) 149 Cal.App.4th 645, 676. CEQA specifically provides that the analysis must avoid speculation, and when no accepted methodology exists to assess an environmental impact, the lead agency may conclude that the impact is too speculative to reliably evaluate and is therefore unknown. In addition, analytical uncertainty does not mandate a conclusion that an impact is significant. *See, e.g., Laurel Heights Improvement Ass'n v. Regents of Univ. of Cal.* (1993) 6 Cal.4th 1112, 1137. When the assessment of a project's effects would be speculative and require an analysis of hypothetical conditions, the effect need not and should not be evaluated in the EIR. *Anderson First Coalition v. City of Anderson* (2005) 130 Cal.App.4th 1173, 1182; *Marin Mun. Water Dist. v. KG Land Cal. Corp.* (1991) 235 Cal.App.3d 1652, 1662. All prior CEC decisions concerning reflective solar projects reviewed¹ by Applicant have determined that because potential avian

¹ Projects reviewed include: Abengoa Mojave Solar Project (2010), Beacon Solar Energy Project (2009), Blythe Solar Power Project (2010), and the Palen Solar Power Project (2010) (solar trough/reflective concentrating mirror technology); the Calico Solar Project (2010) and Imperial Valley Solar Project (2010)(approved originally for

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impacts could not be identified with certainty, they cannot be quantified or precisely measured. Consistent with CEQA, all previous CEC decisions addressed this uncertainty by requiring that adaptive management measures be implemented to identify and reduce unknown (or in certain CEC staff assessments, “expected” avian impacts) to less than significant levels. The PSA should be revised to reflect this approach.

6. The PSA analysis of compliance with the federal Migratory Bird Treaty Act (“MBTA”) and Fish and Game Code Sections 3503.5 (birds of prey protection) and 3513 (California’s MBTA counterpart statute) departs from the prior CEC precedent and practice reviewed by Applicant and appears to take the position that no project can comply with these statutes if any possible future avian impact can be identified. In the prior decisions reviewed by Applicant, the CEC has never previously concluded that any risk of future avian mortality raises these LORS compliance issues, even when the CEC analysis concludes that avian impacts are “expected” to occur. This position is neither credible nor reasonable, as the PSA’s analysis could make unlawful any human activity that might impact birds in the state. In particular, since some degree of avian mortality cannot be completely avoided by many, if not all energy facilities, the PSA approach would appear to require that the Commission find that almost all California energy projects will not comply with LORS. The federal MBTA is the model for the avian protection statutes cited in the PSA (indeed, Section 3513 explicitly references the Act). The application of the MBTA has been extensively addressed by the federal courts, and by the U.S. Fish and Wildlife Service (“FWS”), which has exclusive jurisdiction to enforce the Act. , None of the applicable legal precedents and policies is consistent with the PSA interpretation of the Act.
 - a. As reflected in recent (2012) federal decisions, certain courts have found that MBTA liability does not extend to otherwise lawful, commercially valuable activities that do not intend to harm avian species (see, e.g., *United States v. Brigham Oil & Gas, L.P.*, No. 4:11-po-005-DLH et al., 2012 U.S. Dist. LEXIS 5774 (D.N.D. Jan. 17, 2012; see also *Newton County Wildlife Association v. United States Forest Service* (8th Cir. 1997) 113 F.3d 110, 115.) (MBTA only applies to physical conduct of the sort engaged in by hunters and poachers). Other courts have found that, on facts specific to each case, the MBTA can apply to activities that do not intend to harm avian species, such as an otherwise illegal failure to cover waste oil tanks that the operator knew was killing migratory birds. (see, e.g., *United States v. Citgo Petroleum Corporation, et al.*, No. 2:06-cr-00563 memorandum opinion (S.D. Tex. Sept. 5, 2012); see also *United States v. Moon Lake Electrical Ass’n* (D. Colo. 1999) 45 F.Supp. 2d 1070)(unreasonable refusal to install inexpensive avian protection measures for known hazards subject to MBTA enforcement). Even in these cases, many courts have also noted that the MBTA cannot be construed in a manner that would include any form of migratory bird take. For example, in *United States v. Citgo Petroleum*, the court dismissed claims that the statute could make any bird take illegal by noting that, “Certainly construction that would bring every killing within the statute, such as deaths caused by automobiles, airplanes, plate glass modern office buildings or picture windows in residential dwellings into which birds fly, would offend reason and common sense”(quoting *United States v. FMC Corp.*, 572 F.2d 902, 908 (2d Cir. 1978)).
 - b. Reflecting these concerns, the FWS has recognized that it must avoid overbroad enforcement of the Act, particularly in contexts where unreasonable enforcement would

reflective, concentrating stirling engine solar technology); and the Rice Solar Energy Project (2010) and Ivanpah Solar Energy Project (2010)(concentrating solar tower technology).

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- severely harm critical industries and technologies. In 2000, for example, the Department of the Interior clarified that the FWS has “used enforcement and prosecutorial discretion in the past regarding individuals or companies who have made good faith efforts to avoid the take of migratory birds” in the context of communications towers, which unavoidably cause substantial avian mortality. The intent of the 2000 memorandum was to provide assurance to the communications industry that, without conceding the limitations of the MBTA, tower operators that reasonably implement avian mortality avoidance measures would not be subject to FWS prosecution (Jamie Rappaport Clark, *Service Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers, Memorandum to Regional Directors, U.S. Department of the Interior* (September 14, 2000)). Similarly, in the context of energy pipeline projects that also unavoidably cause avian mortality, the FWS has stated that “[w]hile the FWS recognizes that it cannot absolve companies from liability under the MBTA, it also recognizes that overzealous prosecution would be counter-productive. Thus, in implementing the statute, the FWS has stated that it will focus its enforcement efforts on companies that have acted ‘with disregard for their actions and the law, especially when conservation measures have been developed but are not properly implemented.’” FWS, *Pipeline Development Projects and Conservation of Migratory Birds: A New Tool* (2009), cited in Shippen Howe, *The Intersection of the Migratory Bird Treaty Act and Energy Companies: An Uncertain Crossroad*, Trends: ABA Section of Environment, Energy, and Resources Newsletter, May 2010). The FWS policy of selective enforcement is also described in the Region 8 Interim Guidelines For The Development Of A Project-Specific Avian And Bat Protection Plan For Solar Energy Plants And Related Transmission Facilities adopted by the FWS in September 2010. The FWS again stated that while MBTA liability could not be completely “absolved,” “[T]he [FWS] Office of Law Enforcement focuses its resources on investigating and prosecuting individuals and companies that take migratory birds without identifying and implementing all reasonable, prudent and effective measures to avoid that take.”
- c. None of the precedents discussed above supports the LORS determination adopted in the PSA, as the PSA's position is neither credible nor reasonable. Consistent with CEC precedents and the FWS Solar Energy Guidelines, Applicant is committed to implementing an adaptive management program that will identify and implement all reasonable, prudent and effective measures to avoid avian take should such impacts occur. The PSA should be revised to conclude that these measures will comply with avian-related LORS.
 7. The PSA does not cite evidence suggesting that either Falconiformes or Strigiformes are at significant risk from collisions, solar flux or any other potential impact that may be related to solar reflective technology. The McCrary study identified a single raptor mortality (American kestrel) but did not provide any discussion or analysis related to the exact cause of death for this species and attributed the detection to a collision. No raptor impacts from solar flux were identified in the study. Applicant will implement standard nest avoidance measures, all powerline “bird-safe” and electrocution avoidance measures identified by the CEC and other CEQA lead agencies as sufficient to avoid collision and electrocution impacts to raptors and an adaptive management program that will identify and implement all reasonable, prudent and effective measures to avoid raptor take should such impacts occur. The PSA should be revised to conclude that these measures will comply with raptor-related LORS.
 8. The PSA indicates that a golden eagle mortality model specifically developed to address wind energy impacts to golden eagles is being used to quantify potential golden eagle and other avian take that could be associated with a solar facility. PSA pp. 4.2-84 to 4.2-85. As the PSA notes,

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the model has known predictive flaws even with respect to its intended use for wind energy. PSA, pp. 4.2-84 to 4.2-85. In addition, the potential sources of golden eagle or other avian impacts associated with reflective solar energy technologies, and avian responses to any of these potential impacts, are completely different than those that may occur in the wind energy context. Finally, the PSA repeatedly acknowledges that current information about collision and solar flux risks is not sufficient to quantify potential avian impacts using the wind energy or other models. Under these circumstances, the use of the wind energy golden eagle mortality model would be scientifically indefensible and highly likely to foster inaccurate, potentially misleading information related to solar energy technologies. Applicant requests that the wind energy golden eagle mortality model not be used to estimate solar reflective technology avian impacts in any manner.

9. Throughout the PSA, there are statements that staff considers the acquisition of adequate compensation for blue palo verde – ironwood woodland habitat (microphyll woodlands) to potentially be infeasible. No reasons for this conclusion are provided, but there are statements in the Special Status Plant Communities section in the first paragraph on page 4.2-49 that describe microphyll woodlands as relatively uncommon and refer to McCreedy (2011). McCreedy (2011) uses the entire Sonoran Desert, which occurs primarily in Mexico with over two thirds of its area in Baja California and the state of Sonora (National Park Service 2012), to determine the amount of microphyll woodland habitat in the Colorado Desert. The Northern and Eastern Colorado Desert Resource Management (NECO) Plan provides a more applicable estimate of the percentage of microphyll woodland habitat within the regional desert land base as it only considers the Colorado Desert Region. The NECO planning area includes 5,544,750 acres (over 79%) of the Colorado Desert Region, and the NECO Plan estimates that microphyll woodland habitat makes up 675,000 acres or 12.2% of the planning area (BLM 2002). A preliminary search for privately-owned microphyll woodland habitat using aerial photographs of the region was conducted and over 8,000 acres of what appears to be microphyll woodland habitat was located. This preliminary search covered only the eastern portion of the Colorado Desert, predominantly within the NECO planning area. The estimate in the NECO Plan and identifiable microphyll woodland habitat on aerial photos of the regional area should be considered when determining the feasibility of acquiring adequate compensation of microphyll woodland habitat. Additionally, resident and migratory wildlife species that utilize microphyll woodland habitat prefer mesic riparian habitat along the Colorado River as it provides higher-value foraging opportunities, cover, and breeding sites. Opportunities exist for acquiring high-value habitat along the Colorado River and near regional wildlife refuges that would greatly benefit all wildlife species in the vicinity, including those that utilize microphyll woodland habitat. Acquisition and/or restoration of these lands should be considered as an alternative to acquiring off site microphyll woodlands.

General Comments on Special Status Species and LORS Compliance Issues:

10. The PSA adopts overly broad assessment criteria for impacts to fully protected avian species (Fish and Game Code, Section 3511) and the same species that may also be protected by federal law (e.g., the Bald and Golden Eagle Protection Act ("BGEPA")). Applicant concurs with the PSA's conclusions to the effect that impacts to any of these species, and other listed birds, is unlikely to occur due to various construction and operational conditions that will eliminate habitat and prey thus further reducing the already low likelihood of occurrence within or near the proposed facilities. In the previous approvals reviewed by Applicant, the CEC has found that if the likelihood of impacts to such species is low, projects comply with applicable LORS. The golden eagle, for example, is a California fully protected species and also subject to federal regulation

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under BGEPA. Most, if not all of the previous solar projects approved by the Commission found evidence of golden eagle nests or foraging activity at least as high and often greater than for the Rio Mesa SEGS (where no confirmed active nests have been detected within 10 miles of the facilities). In all such instances, the Commission has found that (a) avoidance and minimization measures would preclude take and significant impacts for powerline and similar collision risks; and (b) an adaptive management program to address any observed mortality would mitigate any potential solar field, mirrored surface and similar impacts that could be associated with new, solar reflective technology and comply with all LORS. The final staff assessment of the Rice project stated that, "The generator tie-line could present a new collision or electrocution threat to golden eagles. Staff's recommended Condition of Certification BIO-8 requires that transmission lines, fiber optic lines, and all electrical components shall be designed, installed, and maintained in accordance with guidelines and practices as recommended by the Avian Power Line Interaction Committee's (APLIC) publications to reduce the likelihood of large bird electrocutions and collisions....The solar generator may present a collision or incineration hazard to golden eagles. Staff's recommended Condition of Certification BIO-25 (above) would evaluate that hazard and implement adaptive management measures as determined necessary. Staff concludes that project impacts of the solar generator site, generator tie-line, and interconnector substation to golden eagle would be less than significant with incorporation of recommended mitigation." The assessment also concluded that the project would comply with all LORS. Rice Final Staff Assessment, pp. 6.2-5 to 6.2-6. The PSA should be revised to reflect prior CEC criteria and approaches for assessing LORS compliance and impacts to fully protected species, including those protected under federal laws such as BGEPA.

General Comments on Collision Impacts and LORS Compliance Assessment:

11. The PSA is inconsistent with prior CEC determinations regarding solar reflective renewable energy technology, which determine that potential collision risks associated with mirrored surfaces are not well understood. Examples include the following:
 - a. In its review of the Abengoa project, CEC staff found that collision risks from mirrored solar reflective equipment is "not well understood" and that such risks could not be estimated or quantified at this time. Abengoa Final Decision, p. 255.
 - b. The assessment of the Blythe project concluded that, "[s]olar facilities present a new and relatively unresearched risk" and that "[v]ery little research has been conducted . . ." on such risks and declined to estimate or quantify them. Blythe Revised Staff Assessment, pp. C.2-79 to C.2-80.
 - c. In the Calico and Rice projects, CEC staff concluded that there is a "lack of research-based data on the impacts of glare and collision threats to birds" Calico Final Staff Assessment, pp. C.2-107 to 108; Rice Final Decision, p. 56.
 - d. The CEC staff acknowledged in the Imperial Valley project review process that reflective surface collision risks were not knowable due to the developing nature of reflective solar technology: "The extent of collision hazard for avian species with SunCatchers is currently unknown . . . the extent of this impact will not be known until there has been some operational experience with SunCatchers." Imperial Valley Final Decision, p. 242.
 - e. Similarly, the CEC acknowledged that existing information regarding mirrored surface interaction with avian species did not allow for a quantification or assessment of risk: "The missing piece of information, which is not supplied by the McCrary study or any others. . . is what the anticipated mortality from collisions might be for a solar trough project . . .

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there is little information and much uncertainty." Palen Staff Rebuttal Testimony at pp. 8-9.

The PSA includes no new information to substantiate its conclusion that, notwithstanding the project's use of the same or similar technology previously considered and approved by the PSA, "collisions with heliostats and injury or mortality from exposure to concentrated solar energy would be a significant and unavoidable adverse impact." PSA, p. 4.2-5. To the contrary, Applicant has provided staff with two recent avian impact studies from Torresol's GEMASolar Project in Southern Spain, and the initial interim avian impact study conducted by Bio-Logic and the Society for the Protection of Nature in Israel at BrightSource's SEDC facility. These studies evidence a nearly complete lack of observed avian mortality at two currently operational solar tower plants in Israel and Spain. In both cases, no collision-related avian mortality of any kind was documented notwithstanding the deployment of mirrored heliostats in areas known to support large avian populations (General Comment 27). Thus, the PSA's position is neither credible nor reasonable.

12. The CEC has also never concluded that an admittedly undetermined collision risk from mirrored surfaces is nevertheless significant and incapable of mitigation, as this position is neither credible nor reasonable. For instance, the Palen project analysis did not find that "bird collision data from powerlines or other reflective surfaces (e.g., windows) could be extrapolated to solar troughs to provide a quantitative assessment of likely bird collisions." As a result, CEC staff observed that "[p]re-construction bird surveys would not provide useful data on post-construction bird use of the site, after it is graded and developed, or information as to how many birds might be attracted to netted evaporation ponds surrounded by solar arrays. This issue of bird collisions with solar arrays is, as staff has described in the RSA, a topic where there is little information and much uncertainty." Notwithstanding uncertainty related to mirrored surface collision risks, which are substantially similar to risks that may be associated with the proposed project, the Palen analysis concluded that, "Condition of Certification BIO-16 provides a conservative and protective approach to addressing the uncertainty associated with the potential threat of bird collisions with the Project's solar arrays, and provides an adaptive management approach for addressing impacts if they occur." Palen Staff Rebuttal Testimony, pp. 8-9. The proposed project includes measures such as **BIO-12** that incorporate a functionally identical conservative and protective approach to addressing the uncertainty associated with the potential threat of bird collisions, and the PSA should be revised to be consistent with the Palen analysis.
13. The CEC staff has previously recognized that structural heights are a substantial factor affecting the likelihood of collisions, and that lower structures reduce such risks. The FSA should thus factor in the heliostat height into its analysis, as demonstrated below.
 - a. The Abengoa Final Decision concluded that collision risks associated with reflective solar troughs would likely be low because, "[t]he tallest proposed AMS facilities are the transmission poles, which would be an average of 80 feet tall and a maximum of 100 feet tall. The solar trough mirrors would be approximately 21 feet tall." Abengoa Final Decision p. 255. In contrast, the proposed project heliostats will be approximately 12-13 feet above ground level, or nearly half the height of the Abengoa mirrored facilities.
 - b. The Beacon Final Staff Assessment also determined that lower structures either reduced or potentially avoided collision risks: "Birds are known to collide with communications towers, transmission lines, and other elevated structures. The tallest structures at the plant site would be the steam turbine generator, which would be 55 feet tall. The power block,

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cooling tower, and other structures would be 50 feet or less in height. These structures at the BSEP site would be unlikely to pose a collision risk because they are shorter than those typically associated with bird collision events and because bird densities...would be even lower after the solar fields are built and no habitat is available to attract birds." Beacon Final Staff Assessment, pp. 4.2-42 through 4.2-43. The project heliostats would be nearly 80% lower than the heights cited as unlikely to pose a collision risk in the Beacon staff assessment.

14. The PSA should clarify that project night tower lighting will comply with current best practices for avoiding nighttime collisions. Such measures could include lighting atop the towers that use flashing strobe lights at the minimum rate required for aviation safety rather than steady burning lights that are known to attract birds, and shielding or extinguishing other project lighting when not needed. These measures will reduce tower and lighting-related collision risks to less than significant levels.
15. The PSA makes several conflicting statements with regards to bird and bat collisions with project structures. Initially, on page 4.2-75, the PSA states that "impacts to bats would be minimal because they would be able to detect collision hazards and would not be active during daylight hours (i.e., when concentrated solar energy is present)", and also in the Gen-tie line conductors and Towers section on p.4.2-76, "The gen-tie line is not expected to pose a significant collision risk to bats due to their echolocation ability, though information on bat collisions with transmission lines is minimal (Manville 2001)". However, the PSA then discusses bats as being at risk of collision in subsequent sections (e.g., p. 4.2-75. Final sentence of lighting section, lines 1, 6, and 10 of p. 4.2-76, etc.) The PSA provides no evidence to support the assumption that bats will collide with static project facilities. Bats should be considered independently and not included in discussions of bird collision risk, except to document that bats are not at risk of collision.

The PSA relies heavily on McCrary et al.'s evaluation of Solar One, and inappropriately extrapolates from the study's findings to draw conclusions or assumptions about potential impacts at RMS. This analysis incorporates a number of major errors and unsupportable assumptions, including the following:

- a. The PSA does not, but should, distinguish Solar One's 130+ acres of open water evaporation ponds (Solar One), an avian attractant, and Rio Mesa's 4 acres of evaporation ponds, all of which would be netted and inaccessible to birds. Moreover, the PSA should acknowledge that the open evaporation ponds at Solar One were an artificial water subsidy in an otherwise arid location with ephemeral natural water supplies. The large source of open water adjacent to the Solar One facility combined with the surrounding irrigated agricultural fields serves as a concentrating feature that draws birds to the site. In contrast, at Rio Mesa, the primary sources of water and food for the majority of birds migrating along the Colorado River portion of the Pacific Flyway are the Colorado River, the network of open irrigation canals, wetlands within Cibola NWR, and the irrigated farm lands located to the east of the project. A small netted evaporation pond does not constitute a draw to birds in this type of project setting.
- b. Several of the species observed at Solar One have not been observed at or in the vicinity of the Rio Mesa site, including several waterbirds that appear to have been attracted by the artificial water sources adjacent to the Solar One plant. It is not appropriate to extrapolate collision risks from the Solar One plant for other locations where a different range of species is known to occur.

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- c. The use of the McCrary study does not control for the relative abundance of birds on each site. The McCrary study indicates that the daily average count of birds over a 370 acre survey area was approximately 314, or 0.8 birds per acre. This is a very high bird density and is likely related to the unique proximity of artificial water sources near the plant.
- d. The PSA states that Rio Mesa will have 37 times more mirror surface area than Solar One, and provides a linear extrapolation of mortality (low estimate) simply based on mirror surface area. However, the PSA does not consider the possibility that a large solar field such as Rio Mesa could result in birds not having equal access to all mirrors. The middle of the solar fields at RMS will be far from the intact habitat in adjacent lands and washes. The PSA further extrapolates on a linear basis an estimate of collisions based on the acreage differences between Solar One and Rio Mesa, even though Staff concludes that acreage is not a valid factor in determining mortality.

The Applicant docketed two avian impact studies from Torresol's GEMASolar project in Spain and the interim spring avian impact study from BrightSource's SEDC facility on November 1, 2012. These studies reflect real world experience with respect to avian impacts from both collision and flux issues. Both studies did not identify any confirmed mortalities related to flux or collisions. Applicant requests that Staff consider the results of these studies in preparation of the FSA.

Applicant believes that it is best to consider the real world experience at the GEMASolar facility in Spain, and the SEDC facility in Israel to identify potential avian mortality risks at modern facilities such as the proposed project. Consistent with all prior CEC approvals of solar projects, Applicant is committed to implementing a robust monitoring and adaptive management program that would evaluate avian impacts from collisions should they occur, identify the causes of any such impacts, and implement responsive measures in consultations with state and federal resources agencies.

General Comments on Electrocutation Impact Assessment:

16. Applicant has committed to design above ground transmission lines according to guidelines in APLIC (2006) and Edison Electric institute (2004) to prevent avian electrocution and minimize electrocution hazard for raptors. The CEC has previously found that these measures will mitigate for impacts to raptors and other species. The PSA appears to suggest that such measures do not mitigate or avoid impacts to small raptors. To the extent this is the position advanced in the PSA, such an approach is not consistent with prior CEC determinations, including the following:
 - a. The Abengoa Final Decision focused on "large aerial perching birds" and concluded that the "proposed AMS 230-kV transmission lines are not likely to result in bird electrocutions" with implementation of APLIC design guidelines. Abengoa Final Decision, pp. 255-256.
 - b. The Beacon Final Decision found that "[l]arge raptors like golden eagles can be electrocuted by transmission lines when a bird's wings simultaneously contact two conductors of different phases, or a conductor and a ground. To minimize risk of electrocution, BSEP will use a 'raptor-friendly' construction design for the transmission line with conductor wire spacing greater than the wingspans of large birds to help prevent electrocution. With the mitigation addressed in Condition of Certification BIO-8, we find that the transmission lines will not pose a significant threat to birds because the conductor wire spacing of the transmission line will be greater than the wingspans of large birds which will thus prevent electrocution." Beacon Final Decision, pp. 244-245.

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- c. The Calico Final Staff Assessment concluded that "[p]ower line electrocutions result in the losses of tens to hundreds of thousands of birds annually in the United States (Erickson et al. 2001). In the project area, golden eagles, red-tailed hawks, and other large aerial perching birds are susceptible to electrocution on power lines because of their large size, distribution, and proclivity to perch on tall structures that offer views of potential prey. Electrocution occurs when a perching bird simultaneously contacts two energized phase conductors or an energized conductor and grounded hardware. This happens most frequently when a bird attempts to perch on a transmission tower/pole with insufficient clearance between these elements." Calico Final Staff Assessment p. C.2-108. The Commission found that, by complying with APLIC avian design guidelines, the project would not result in significant impacts to avian species from electrocution. Calico Final Decision, pp. 61, 71.
- d. The Palen, Imperial Valley, and Blythe Final Decisions each analyzed raptor electrocution risks and concluded that with the implementation of the APLIC design guidelines, any such impacts would be less than significant. Palen Final Decision, p. 32; Imperial Valley Final Decision, pp. 241-242; Blythe Final Decision, pp. 256-257.

General Comments on Cumulative Impact Analysis:

17. In contrast to each of the previous CEC assessments of solar reflective technologies reviewed by Applicant, the PSA asserts without support that the project, even with mitigation, would contribute to cumulatively significant "bird mortality" due to (a) collision and solar energy flux hazards (with the exception of large raptors), and (b) the loss of golden eagle foraging habitat.
 - a. The CEC has analyzed substantially similar solar reflective renewable energy projects, including solar tower facilities, on several occasions. Applicant has not found any instance where the CEC staff concluded that any project could result in significant cumulative impacts to "bird mortality." In all other cases, the staff analysis has determined that the potential avian impacts for new, developing solar reflective technologies are too speculative to reasonably characterize or anticipate. In each case, the staff has recommended adaptive management programs to identify and respond to potential impacts should any occur, and the staff and the Commission have determined that avian impacts would be less than significant with the implementation of these measures. After conceding that there is no new basis for characterizing potential impacts in any systematic manner, the PSA, on the basis of "belief," concludes that the project's admittedly unknown impacts will be significant and cannot be feasibly be mitigated. As discussed in detail in the preceding general comments, there is no basis in fact or law to reach any such conclusions with respect to project impacts. As a result, the contention that the project's unknown impacts will also be cumulatively significant also lacks a sufficient factual and legal basis. The PSA's position is neither credible nor reasonable. The PSA should be revised in manner consistent with prior precedent regarding cumulative avian mortality impacts.
 - b. The PSA does not explain or provide any evidence in support of the assertion that the loss of potential golden eagle foraging habitat, which the CEC concedes will be "mitigated to less than significant with staff's recommended conditions of certification," (PSA, Table 6) will nonetheless be cumulatively significant. As discussed above, two years of golden eagle surveys performed in accordance with FWS guidelines have conclusively demonstrated that the project is located in a region that provides at most marginal golden eagle habitat and in which regionally significant golden eagle populations are not likely to occur over time. The CEC has considered potential golden eagle foraging habitat impacts associated with several

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solar reflective technology projects and, to the best knowledge of the Applicant, has never before found that any of these projects would generate a cumulatively significant loss of golden eagle foraging habitat. The golden eagle foraging habitat functions and values of the project site are likely substantially lower than, or at most, comparable with the corresponding functions and values of the other energy projects reviewed by the CEC. Based on these considerations, the PSA should be revised in a manner consistent with prior Commission precedent to state that, with full mitigation, and considering the relatively low value of the land subject to disturbance, the project would not cumulatively contribute to a significant loss of golden eagle foraging habitat. If generally adopted by the CEC, the position advanced in the PSA would effectively compel the Commission to find that any project in an area potentially traversed by a golden eagle would generate a cumulatively significant foraging habitat loss for the species.

General Comments on Wetlands, Waters, and Vegetation Impact Analysis:

18. The PSA requests that Applicant prepare and submit a Lake and Streambed Alteration Agreement (LSAA) Notification to the DFG, including a complete LSAA Notification with up-to-date state waters delineation, project impacts, proposed mitigation, and any other supporting documents. PSA, pp. 4.2-141 to 4.2-142. Applicant is preparing an LSAA for submission to CDFG, including the documentation requested by CEC staff, in November, 2012. On September 24-28, 2012 biologists from WRA Inc. (WRA) performed a focused evaluation of potential areas under DFG jurisdiction within the proposed project site and in the surrounding area (the "Biological Survey/Study Area" or "BSA"). The purpose of the evaluation was to more precisely map and field-verify resources subject to state and federal jurisdiction that had previously been estimated by using remote sensing techniques, such as aerial photographs. Consistent with applicable DFG guidance, the evaluation considered that all streams and areas extending laterally to the top of a bank ("TOB") were subject to DFG jurisdiction. If riparian vegetation was present within or at the TOB, DFG jurisdiction was mapped as extending to the outer dripline of such vegetation. Consistent with DFG practice, areas adjacent to a stream that demonstrate a dominance of hydrophytic vegetation, hydric soils and/or wetland hydrology were also evaluated as potentially subject to DFG jurisdiction. All wetlands associated with a stream or lake were also mapped and identified as subject to DFG jurisdiction. Two riparian plant communities, the Blue Palo Verde—Ironwood Woodland Alliance and the Mesquite Bosque Woodland Alliance were evaluated during the focused evaluation.

On October 13-19, 2012 WRA subsequently conducted additional field verification and mapping of both riparian and upland vegetation within the BSA. A revised delineation of waters potentially subject to federal jurisdiction based on the results of the LSAA field verifications was submitted to the U.S. Army Corps of Engineers on October 8, 2012. The revised delineation was prepared following on-site surveys conducted from September 24-28, 2012 and using the guidance issued by the Corps of Engineers for determining the ordinary high water mark (OHWM) in the arid west region of the United States. The results of the field verifications are being used to prepare the LSAA notification; up-to-date delineation and other information requested by CEC staff have been incorporated into the specific comments provided by Applicant on the PSA.

19. The analysis conducted in support of the LSAA application requested by the CEC staff also determined that previously identified desert dunes habitat along the gen-tie line was in fact creosote bush scrubland under the relevant vegetation criteria. These areas have enough

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habitat components, however, to support the Mojave fringe-toed lizard as illustrated by the survey detections of this species identified in the PSA.

20. There is no evidence that the PSA has based its thresholds on existing laws or standards. Instead, the PSA presents thresholds “identified by Energy Commission staff”, without any clear discussion or rationale for the basis of the threshold. Given the vague description of standards and thresholds, it is imperative that the FSA identify with specificity exactly where the significance criteria applied were developed and why they are appropriate for use in analyzing the RMS project. Thresholds of significance should be based on existing environmental laws and regulations (e.g. endangered species laws or migratory bird protection laws).

The Governor’s Office of Planning and Research (“OPR”) provides important guidance to agencies regarding the establishment of thresholds of significance. In its *CEQA Technical Advice Series, Thresholds of Significance: Criteria for Defining Environmental Significance*, the OPR states that “Thresholds can and should be based on existing environmental laws and regulations whenever possible to reduce duplicative environmental reviews and take advantage of regulatory agency expertise.”² This policy consideration was recognized in *Protect the Historic Amador Waterways v. Amador Water Agency*, which stated that thresholds drawn from existing environmental standards help promote “consistency in significance determinations and integrating CEQA environmental review activities with other environmental program planning and regulation.”³

21. Applicant submitted a Technical Memorandum prepared by Worley Parsons (Tech Memo) to CEC Water Supply Staff that addressed Staff’s specific questions regarding error messages that were generated within Staff’s GMS version of the MODFLOW 2000 model. This Tech Memo is attached to Applicant’s comments on the Water Supply section of the PSA as Appendix Water Resources 1. The error messages had led Staff to question the reliability of Applicants groundwater assessment utilizing the MODFLOW 2000 model with Groundwater Vistas. On October 25, 2012, Applicant’s technical consultants met with CEC Water Supply Staff to review the content of the Tech Memo. The Tech Memo specifically addressed CEC’s concerns through the running and describing of sensitivities run to demonstrate to Staff that the model is indeed reliable. All versions of the RMS model including four different refinements of the model prepared in response to CEC comments have generated comparable results and calibration statistics. Each shows that the project’s groundwater impacts will be less than significant. The consistency of the results indicates that the RMS models provide a reliable, hydrogeologically realistic and valid method for assessing project impacts. After discussing the specifics of the model sensitivities, CEC Staff concluded that the MODFLOW 2000 Groundwater aquifer assessment model that was provided by Applicant was acceptable and was accurate for predicting impacts on the PVMGB from Rio Mesa project pumping.⁴ The Technical Memorandum is included with Applicant’s comments to the PSA within the Water Supply Section.

Consequently, since CEC Water Supply Staff has accepted that impacts to the PVMGB will be less than significant, the reason for imposing Condition of Certification BIO-8 is no longer valid and the proposed condition should be deleted, as discussed in Applicant’s Specific Comments below.

² *THRESHOLDS OF SIGNIFICANCE: Criteria for Defining Environmental Significance*, Office of Planning and Research, CEQA Technical Advice Series, 1994, p. 7 (emphasis added).

³ See, *Protect the Historic Amador Waterways v. Amador Water Agency*, 116 Cal. App. 4th 1099, 1107 (Cal. App. 3d Dist. 2004); citing to *Communities for a Better Environment v. California Resources Agency*, supra, 103 Cal.App.4th at p. 111

⁴ CEC Water Supply Staff, October 29, 2012 PSA Workshop

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22. The use of Horvath et al.'s 2009 paper as a definitive reference to support the concept that polarized light pollution can alter the ability of wildlife to seek out suitable habitat, elude or detect predators, and detect natural polarized light patterns (PLP) which can affect navigation and ultimately affect dispersal and reproduction misunderstands Horvath et al.'s work. Horvath et al. review the current understanding of the influence of PLP on the behavior of polarization-sensitive organisms and their interactions and communities. The review demonstrates that the majority of our understanding is limited to results of studies of aquatic insects. Horvath et al.'s review provides strong evidence that PLP causes aquatic insects to mistake anthropogenic features with strong horizontal polarization signatures (e.g., asphalt, gravestones, cars, oil spills, etc.) for water bodies. And, although the article does mention that obligate waterbirds are occasionally found dead or injured on large asphalt parking lots and roads, no factual basis is provided to directly link these events with PLP or polarization-sensitivity by the birds. Likewise, the authors discuss the association of PLP with changes in predator-prey dynamics and speculate on its potential influence of higher level animal navigation and orientation, but the review provides no empirical linkages to potential impacts caused by PLP. The role of polarization sensitivity in higher-level animals (e.g., birds in particular) is not specifically evaluated in Horvath's review, and it is actually presented by the authors as "a task of future research".

The importance of PLP and our understanding of polarization sensitivity in animals is very limited. Applicant is in strong disagreement with the Staff's extrapolation of insect research to reach broad conclusions regarding PLP impacts on wildlife habitat selection, predator avoidance, navigation, dispersal and reproduction. Research-based support for CEC staff's position is absent in the PSA.

23. No evidence is provided by Staff to support the assumption that bats will collide with static project facilities. The PSA states that "impacts to bats would be minimal because they would be able to detect collision hazards and would not be active during daylight hours (i.e., when concentrated solar energy is present)", and also states that "The gen-tie line is not expected to pose a significant collision risk to bats due to their echolocation ability, though information on bat collisions with transmission lines is minimal (Manville 2001)". The PSA then inconsistently discusses bats as being at risk of collision in subsequent sections (e.g., p. 4.2-75. Final sentence of lighting section, lines 1, 6, and 10 of p. 4.2-76, etc.) The inconsistency should be corrected to indicate no significant risks to bats throughout the document.
24. Equating "impact" with "significant impact", without analysis, is contrary to law. Just as neither CEQA nor applicable case law requires a "zero impact" determination to conclude that a project will have a less than significant impact on the environment, the fact that a project may have an impact does not compel the conclusion that such an impact is significant.⁵ Therefore, to the extent that the PSA finds that the project has a significant impact on the basis that the project will cause an impact, such findings are in error without a showing that the impact is a substantial, or potentially substantial, adverse change in the physical environment.

⁵ See, *National Parks & Conservation Assn. v. County of Riverside*, 71 Cal. App. 4th 1341, 1359 (Cal. App. 4th Dist. 1999); also see *Oakland Heritage Alliance v. City of Oakland* (2011) 195 Cal.App.4th 884 ("We do not accept the premise implicit in the Alliance's argument, that under CEQA, as a matter of law, seismic impacts are significant unless buildings could be repaired and ready for occupancy after a major earthquake. Nothing in CEQA, the cases interpreting it, or common sense compels such a conclusion. A less than significant impact does not necessarily mean no impact at all. (See *National Parks & Conservation Assn. v. County of Riverside* (1999) 71 Cal.App.4th 1341, 1359; Cal. Code Regs., tit. 14, § 15064, subd. (b). (emphasis added).)

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25. In the Verification language where the submittal timing is specified, please add the words, “or such time as agreed upon by the project owner and the CPM.”

General Comments on Appendix BIO1:

Applicant’s initial comments on the Appendix BIO1 are separated into two specific subject areas. The first subject area will respond to Staff’s assertion in the PSA that the Solar Receiver Steam Generator (SRSG) will need replacement every four years, and the second subject area will address avian flux risk.

Avian Flux Risks

26. The PSA makes assertions and conclusions with respect to the risks to avian species from solar flux that are neither credible nor reasonable. The PSA analysis is based on an analytical approach to flux intensity and potential impacts that has never been disclosed in any prior CEC document. Applicant is continuing to analyze the PSA and will provide more detailed comments when this assessment is complete. It is important to note, however, that the PSA conclusions conflict with and are unsupported by the McCrary study that is extensively cited by CEC staff, and with academic assessments of avian mortality at the SEDC facility in Israel and the GEMASolar facility in Spain.
27. The PSA includes several speculative assertions regarding potential flux impacts, including unreasonable claims that even short exposures to radiant flux levels above 4 kW/m² may cause irreversible damage to feathers, or that birds exposed to levels above 25 kw/m² would suffer damage to feathers, eyes, or skin and cause subsequent offsite mortality. All available evidence from Solar One, SEDC and GEMASolar is inconsistent with such speculation. The McCrary study characterized flux-related impacts as follows:

“Thirteen (19% [of total mortality]) birds (7 species) died from burning in the standby points. Although we never observed a bird fly through one of the standby points, the heavily singed flight and contour feathers indicated that the birds burned to death (Fig. 2). Six (46%) of these fatalities involved aerial foragers (swifts and swallows) which are apparently more susceptible to this form of mortality because of their feeding behavior. Three of these aerial foragers died during a 2-wk period in May 1982, corresponding with the presence of the highest numbers of swifts and swallows observed (500 per day), and an extensive period of heliostat testing when the occurrence and intensity of standby points was probably greater than at other times.”

If the PSA risk analysis was accurate, the Solar One researchers should have detected a significantly higher rate of flux-related impacts based on the average daily abundance of birds identified in the McCrary report of approximately 314 (+203 SD) with a range of 148-1040 per day. In particular, the McCrary analysis was conducted during a time when the species that the researchers believed to be most at risk from flux impacts—swifts and swallows—were especially concentrated at the facility (500 per day) and at the same time that heliostat testing generated higher than typical levels of flux. Over this two-week period, the McCrary analysis indicates that approximately 7,000 swallows and swifts would have occurred at the facility. In contrast with the PSA’s speculative analysis that virtually any flux exposure over 4kW/m² would adversely affect birds, the study identified three (3) swift and swallow mortalities (0.042%) among the highest risk species during the period of most intense flux exposure. The McCrary research team surveyed an area of approximately 370 acres, or more than four times the size of the 80-acre solar facility. The level of swift and swallow mortality documented during the highest-flux testing period in the study does not support the speculative assessment in the PSA. The two-

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week period when most swift and swallows mortalities were observed at Solar One also apparently corresponded with the time when the heliostats were more frequently focused to single standby points. As a result, the data supports the conclusion that the Solar One facility standby point technology, which is no longer used by modern solar plants, likely caused much of the mortality that was observed from singeing and burning in the study.

28. To Applicant's best knowledge, there are no avian rehabilitation facility records identifying birds with burned feathers or damaged eyes during operation of Solar One. No such onsite or offsite avian impacts have been reported at the SEDC or GEMASolar facilities. The lead GEMASolar researcher has also stated that none of the nature preserves located adjacent to the facility have reported any avian mortalities or injured birds notwithstanding the substantial avian population in the area. There was no indication of a regional avian population decline during the operation of Solar One, and none have been detected at the SEDC, or GEMASolar facilities. These results are consistent for each of the three facilities and also fail to support the PSA analysis.
29. Applicant understands that the proposed RMS facilities are larger than the Solar One, SEDC and GEMASolar plants and is committed to implementing a robust and effective operational monitoring program to evaluate any unforeseen impacts to avian species, should they occur, and to identify and respond with appropriate measure as may be required. This program will allow for the accurate assessment of any avian impact issues, and focused and effective responses to any identified issues warranting action. As discussed above in Applicant's General Comments to the PSA, these issues have been considered in several CEC approvals of substantially similar technology, and in each case the Commission has found that a robust adaptive management approach will mitigate impacts to less than significant levels and comply with all LORS.

SRSG Lifespan

31. The PSA states, "In spite of careful design and material selection, and emergency defocusing protocols for the mirrors, the SRSG would need to be replaced about every 4 years." This statement is inaccurate. There is no basis for concluding that the SRSG will have anything other than the expected 25 or more year duty period.

The SRSG will be built according to the specifications and requirements of all applicable codes, including the American Society for Material Engineering (ASME) code Section I – Power Boilers. This is the same standard as utility steam boilers. The design service lifetime is 25 years, considering daily cyclic operation and startup and shutdown sequences.

32. The SRSG is being provided by one of the world's most experienced solar boiler manufacturers in the world, Alstom Power. Alstom in design, manufacture, procurement, construction and servicing, has been a leader in clean, efficient, flexible and integrated power generation solutions for over a century.
33. Fatigue and creep analysis for SRSG is being performed by the SRSG supplier, Alstom Power Inc., according to ASME FFS and EN12952-3. A power boiler is required to pass annual inspections subject to requirements of Factory Mutual and a power boiler with a four year life span would not be certifiable. The SEDC boiler in Israel has already operated for over four years in similar operating conditions. Further, the PSA statement is generally refuted by the experience at Solar 1 and Solar 2 which operated in similar operating conditions.

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34. Prior to obtaining financing, the power boiler design and construction specifications will be approved by the bank's independent engineer – as has already occurred for the Ivanpah equipment.
35. Staff did not raise concerns about the design standards of the SRSG during discovery or mention this issue in the Facility Design chapter of the PSA. The substantial evidence, provided by research and experience in the development of the ASME and international code organization design standards for power boilers, a leader in the field of manufacture of power boilers of all types is in direct contradiction to the Staff's statement in the PSA. .Therefore all statements pertaining to SRGS durability related to the CEC staff's flux analysis, and in the biology section of the PSA, should be deleted in their entirety.

FINDINGS OF FACT

No findings of fact listed in this section of the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

1. **Pages 4.2-142 through 4.2-148, BIO-1:** Consistent with Applicant's specific comments and conditions of certification with prior projects, please make the following edits to Items C and D within the condition:

C. Biological Monitor. The project owner, Designated Biologist, and Authorized Desert Tortoise Biologist will appoint Biological Monitors as needed for the construction, operations, and closure phases of the project. The project owner shall submit the ~~resume, at least three references, and contact information~~ USFWS Desert Tortoise Authorized Biologist Request Forms of each proposed Biological Monitor to the CPM. The ~~resume-Forms~~ shall demonstrate, to the satisfaction of the CPM in consultation with BLM, CDFG, and USFWS, the appropriate education and experience to accomplish the assigned biological resource tasks. The Biological Monitor shall hold the responsibilities described by the USFWS designated Desert Tortoise Monitor (USFWS 2008b) and shall work only under direct supervision of the Authorized Desert Tortoise Biologist for any desert tortoise surveys, translocation activities, or related activities. In addition, the Biological Monitors shall assist the Designated Biologist in conducting surveys and in monitoring of site mobilization activities, construction-related ground disturbance, grading, boring, or trenching. Regardless of the biological Monitor's qualifications, the Designated Biologist and Authorized Desert Tortoise Biologist shall have final responsibility for duties listed in Parts A and B of this condition (above). The project owner and Designated Biologists shall ensure that a Biological Monitor, under the supervision of the Designated Biologist, is available for monitoring and reporting of any project activities that may affect biological resources during the life of the project.

D. Designated Biologist, Authorized Desert Tortoise Biologist, and Biological Monitor Authority. The project owner's construction, operation, or closure manager shall act on the advice of the Designated Biologist, Authorized Desert Tortoise Biologist, and Biological Monitor ("Biology Staff") to ensure conformance with the biological resources

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conditions of certification. The Designated Biologist, Authorized Desert Tortoise Biologist, and Biological Monitors shall have the authority to immediately stop any activity that is not in compliance with conditions of certification or to order any reasonable measure to comply with these conditions. The project owner's construction, operation, or closure manager shall halt any site mobilization, ground disturbance, grading, boring, trenching, and operation activities as specified by the Designated Biologist, Authorized Desert Tortoise Biologist, or Biological Monitor. The Designated Biologist and Authorized Desert Tortoise Biologist shall:

1. Require a halt to ~~any or all~~ activities that would cause an unauthorized adverse impact to biological resources if the activities continued;
 2. Require a halt to any or all activities that would cause take of a desert tortoise or other protected species or listed threatened or endangered species;
 3. Inform the project owner and the construction/operation manager when to resume activities;
 4. Notify the CPM if there is a halt of any activities at the direction of the Designated Biologist Pursuant to this Condition of Certification and advise them of any corrective actions that have been taken or would be instituted as a result of the work stoppage; and
 5. If the Designated Biologist and Authorized Desert Tortoise Biologist are unavailable for direct consultation, the Biological Monitor shall halt work as necessary on their behalf.
2. **Pages 4.2-148 through 4.2-151, BIO-2:** Consistent with Applicant's specific comments and conditions of certification with prior projects, please make the following edits:

BIO-2 The project owner in coordination with the Designated Biologist shall prepare a Draft Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), to the CPM for review and approval in consultation with BLM, CDFG, and USFWS. Upon revision and approval, the project owner shall implement the final BRMIMP. The BRMIMP shall incorporate all avoidance and minimization measures described in conditions of certification and all related plans as required therein, including but not limited to: the Revegetation Plan; the Integrated Weed Management Plan; the Desert Dry Wash Woodland Monitoring Plan; the Long-Term Habitat Management Plan for Off-site Compensation Land; appropriate action plan(s) for plant salvage, horticultural propagation and re-introduction, or off-site habitat enhancement for special-status plants; the Protected Plant Salvage Plan; the Nesting Bird Management Plan; the Eagle Protection Plan; ~~the Bird and Bat Conservation Strategy~~ Avian and Bat Protection Plan; the Bird and Bat Monitoring Study; the Desert Tortoise Translocation Plan; the Raven Monitoring, Management, and Control Plan; the Golden Eagle Monitoring and Management Plan, the Burrowing Owl ~~Relocation and Mitigation Plan~~ Mitigation and Monitoring Plan; ~~the Desert Kit Fox and American Badger Management Plan~~; and the Closure, Revegetation, and Reclamation Plan.

The BRMIMP shall include accurate and up-to-date maps depicting the locations of sensitive biological resources that require temporary or permanent protection during construction and operation. The BRMIMP shall include complete and detailed descriptions of the following:

1. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner and approved by the Commission;

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2. All biological resources conditions of certification adopted by the Energy Commission to avoid or mitigate impacts, and cross-reference to all measures as specified in compliance documents as required under those conditions;
3. All biological resource mitigation, monitoring, and compliance measures required in federal agency terms and conditions, ~~such as those provided in the USFWS Biological Opinion and any additional BLM or USFWS stipulations;~~
4. Procedures for collapsing inactive dens, monitoring active dens, and strategies for passive relocation for any badger and kit fox animals or dens identified during construction as a result of surveys conducted pursuant to BIO-18.
5. A list of all construction and operations activities requiring that the Designated Biologist, Authorized Desert Tortoise Biologist, or Biological Monitor must be on the site;
6. A list of all specific requirements and obligations of the project owner to inspect, monitor, mitigate or avoid impacts to biological resources, specifying the individual responsibilities for each item;
7. An inspection schedule detailing all measures that shall be taken to avoid or mitigate take of special-status species or damage to biological resources, and temporary or indirect disturbances from project activities;
- ~~8. Duration for each type of compliance monitoring and a description of monitoring methodologies and frequency;~~
- ~~9. Performance standards to evaluate whether required mitigation is or is not successful;~~
- ~~10. Remedial measures to be implemented if performance standards are not met;~~
- ~~11. All facility closure measures relating to biological resources, including a description of funding mechanism(s); and~~
8. A process for proposing plan modifications to the CPM and any other appropriate agencies for review and approval.

Verification: The project owner shall provide the CPM with written notice of intent to start ground disturbance at least 30 days prior to the start of these activities. Within 30 days of receipt, the CPM will notify the project owner of the BRMIMP's acceptability. The project owner shall submit the final BRMIMP, as reviewed and approved by the CPM in coordination with BLM, CDFG, and USFWS to the CPM at least 30 days prior to start of any preconstruction site mobilization and construction-related ground disturbance, grading, boring, and trenching. No construction-related ground disturbance, grading, boring, or trenching may occur prior to approval of the final BRMIMP by the CPM in consultation with the other agencies. The project owner shall have 14 days to address the CPM's comments and provide the CPM with two hard copies of the revised BRMIMP.

The BRMIMP shall be a comprehensive summary of all federal permit requirements and conditions of certification relating to biological resources. If any related federal permit or agreement is ~~revised or~~ finalized after the BRMIMP is approved, then a copy of the ~~revised or~~ finalized federal permit shall be submitted to the CPM within five days and the BRMIMP shall be revised or supplemented to reflect the federal permit conditions within 10 days of their receipt by the project owner. No ground disturbance shall proceed except as specified and in compliance with all permit requirements and conditions of certification.

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To verify that the extent of construction disturbance does not exceed that described in this analysis, the project owner shall submit aerial photographs, at an approved scale, taken before and after construction to the CPM. The first set of aerial photographs shall reflect site conditions prior to any preconstruction site mobilization and construction-related ground disturbance, grading, boring, and trenching, and shall be submitted at least 30 days prior to initiation of such activities. The second set of aerial photographs shall be taken subsequent to completion of construction, and shall be submitted to the CPM no later than 90 days after completion of construction. The project owner shall also provide a final accounting of the acreages of vegetation and land use types before and after construction and a depiction of the approved project boundaries superimposed on the post project aerial photograph. If final acreages or disturbance footprints exceed those previously approved, the CPM shall coordinate with project owner, in consultation with BLM, CDFG, and USFWS to determine appropriate mitigation for such impacts. Such mitigation may exceed the requirements as outlined in these conditions of certification (i.e., higher mitigation ratios may be imposed for unauthorized habitat impacts).

No changes to the ~~approved~~ BRMIMP (including the project footprint) may be made except as approved by the CPM in consultation with BLM, CDFG, and USFWS.

Implementation of all BRMIMP measures shall be reported in the MCR by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval in consultation with BLM, CDFG, and USFWS, a written construction termination report identifying which items of the BRMIMP have been completed, a list and description of any modifications to conditions of certification or permit conditions made during the project's preconstruction site mobilization and construction-related ground disturbance, grading, boring, and trenching, a list of all mitigation and monitoring requirements that are still outstanding, and a timeline for implementing outstanding items.

3. **Pages 4.2-151 through 4.2-160, BIO-3:** Consistent with Applicant's specific comments and conditions of certification with prior projects, please make the following edits:

BIO-3 The project owner shall provide compensatory mitigation acreage to offset the project's adverse impacts to native vegetation and wildlife. Compensation ratios shall be as follows:

- Creosote bush scrub: 1:1;
- Desert dry wash woodlands (blue palo verde – ironwood woodlands): 3:1
- ~~Other special-status plant communities: 3:1~~
- ~~Off site desert dry wash woodlands (see **Condition of Certification BIO-8**);~~
- **Condition of Certification BIO-9**
- Special-status plant habitat:
- Suitable and occupied desert tortoise habitat: 1:1 (see **Condition of Certification BIO-14**)
- Burrowing owl foraging habitat: ~~900 acres~~ 19.5 acres per territory as determined by preconstruction surveys (see **Condition of Certification BIO-17**)
- Golden eagle foraging habitat 1:1

The project owner will acquire and protect in perpetuity no fewer than ~~5,175.5~~ 4299.7 acres of habitat lands, to be adjusted to reflect the final project footprint, as specified in this condition. For purposes of this condition, the project footprint means all lands disturbed in

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the construction and operation of the project, including all linear project components, as well as undeveloped areas inside the project's security fence that will no longer provide viable long-term habitat for desert tortoise or other special-status wildlife. In addition, the project owner shall provide funding for initial improvement and long-term maintenance, enhancement, and management of the acquired lands for protection and enhancement of habitat values, and comply with other related requirements of this condition. Staff's estimated costs of the habitat compensation requirements are presented in **Biological Resources Table 8**.

The project owner shall provide financial assurances as described below in the amount of \$ ~~30,253,666~~16,033,810. In lieu of acquiring lands itself, the project owner may satisfy the requirements of this condition by depositing funds into a REAT Account established with the National Fish and Wildlife Foundation (NFWF), below. If the project owner elects to establish a REAT NFWF Account and have NFWF and the agencies complete the required habitat compensation, then the total estimated cost of complying with this condition shall be \$ ~~30,997,331~~16,462,132. The amount of security or NFWF deposit shall be adjusted up or down to reflect any revised cost estimates recommended by REAT.

The actual costs to comply with this condition will vary depending on the final footprint of the project, the costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a Property Analysis Report (PAR) or similar analysis (below). Compensation acreage and funding requirements shall be adjusted up or down if there are changes in the final footprint of the project or the costs of evaluation, acquisition, management, and other factors listed in **Biological Resources Table 8**. Regardless of actual cost, the project owner shall be responsible for funding all requirements of this condition.

Compensation Land Acquisition

1. Method of Acquisition. Compensation lands shall be acquired by either of the two options listed below. Regardless of the method of acquisition, the transaction shall be complete only upon completion of all terms and conditions described in this condition of certification.
 - a. The project owner shall transfer title and/or conservation easement of compensation lands to a state or federal land management agency (if agency policy is compatible with habitat conservation in perpetuity) or to a third-party land management organization, as approved by the CPM in consultation with BLM, CDFG, and USFWS; staff recommends transfer in fee title to the lands to CDFG under terms approved by CDFG. Alternately, a CDFG-approved non-profit organization qualified pursuant to California Government Code § 65965 may hold the fee title or a conservation easement over the lands. In the event an approved non-profit holds title, a conservation easement shall be recorded in favor of CDFG in a form approved by CDFG; in the event an approved non-profit holds a conservation easement over the lands, CDFG shall be named third party beneficiary; or
 - b. The Project owner shall deposit funds into a project-specific subaccount within the REAT Account established with the NFWF, in the amount as indicated in **Biological Resources Table 8** (adjusted to reflect final project footprint and any applicable REAT adjustments to costs).

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2. Selection Criteria for Compensation Lands. All compensation lands shall meet the following selection criteria. In addition, lands designated by the project owner as compliance for specific resource compensation according to recommended Conditions of Certification ~~BIO-8~~ through BIO-9, BIO-10, BIO-14, and BIO-17 shall also meet any additional selection criteria named in those conditions. In general, the compensation lands shall provide habitat conditions, quality, and function that are equal or better than those present on the habitat to be impacted. Compensation lands shall:
 - a. Contribute to wildlife habitat connectivity;
 - b. Be generally undisturbed or have disturbance levels comparable to the habitat on the project site prior to construction, and have capacity to regenerate naturally when existing or ongoing disturbances are removed;
 - c. Be near larger blocks of lands that are in public or private ownership providing protection for biological resources and habitat values, planned for resource protection by a public or private entity; or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation;
 - d. Have no extensive damage to soils, vegetation, or other disturbance from recreational, mining, or other land uses that are greater than those present on the habitat to be impacted and which might cause future erosion or other habitat damage, and make habitat recovery and restoration infeasible;
 - f. Have non-native weeds or invasive species that are greater than those present on the habitat to be impacted and might jeopardize habitat recovery and restoration on the proposed compensation lands and adjacent to them at abundance less than or (at most) similar to their abundance on the project site prior to construction, either on or immediately adjacent to the parcels under consideration;
 - g. Not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat; and
 - h. Have water and mineral rights included as part of the acquisition, unless the CPM, in consultation with BLM, CDFG, and USFWS, agrees in writing to the acceptability of land without these rights.
3. Review and Approval of Compensation Lands Prior to Acquisition. The project owner shall submit a formal acquisition proposal to the CPM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands in relation to the criteria listed above and in Conditions of Certification ~~BIO-8~~ through BIO-9, BIO-10, BIO-14, and BIO-17. The CPM will review the proposal in consultation with BLM, CDFG, and the USFWS.
4. Compensation Lands Acquisition Conditions: The project owner shall comply with the following conditions relating to acquisition of the compensation lands after the CPM, in consultation with BLM, CDFG, and USFWS, has approved the proposed compensation lands:

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- a. Preliminary Report: The Project owner or an approved third party shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for each proposed compensation parcel to the CPM for review and approval in consultation with BLM, CDFG, and USFWS. For conveyances to the state, approval may also be required from the California Department of General Services, the Fish and Game Commission, and the Wildlife Conservation Board.
 - b. Title/Conveyance: The project owner shall acquire and transfer fee title to the compensation lands, a conservation easement over the lands, or both as required by the CPM in consultation with CDFG. Any transfer of a conservation easement or fee title must be to CDFG, an approved non-profit organization qualified to hold title to and manage the compensation lands (pursuant to California Government Code § 65965), or to BLM or other public agency (if agency policy is compatible with conservation in perpetuity) approved by the CPM in consultation with CDFG. If an approved non-profit organization holds fee title to the compensation lands, a conservation easement shall be recorded in favor of CDFG or another entity approved by the CPM. If an approved non-profit holds a conservation easement, CDFG shall be named a third party beneficiary. If an entity other than CDFG holds a conservation easement over the compensation lands, the CPM may require that CDFG or another entity approved by the CPM, in consultation with CDFG, be named a third party beneficiary of the conservation easement. The project owner shall obtain approval from the CPM, in consultation with CDFG, of the terms of any transfer of fee title or conservation easement to the compensation lands.
 - c. Property Analysis Record. Upon identification of the compensation lands, the project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate amount of the long-term maintenance and management fund to pay the in perpetuity management of the compensation lands. The analysis must be approved by the CPM, in consultation with CDFG, before it will be used to establish funding levels or management activities for the compensation lands.
5. Compensation Lands Acquisition Costs: The project owner shall pay all other costs related to acquisition of compensation lands and conservation easements. In addition to actual land costs, these acquisition costs shall include but shall not be limited to the items listed below. Management costs including site cleanup measures are described separately, in the following section of this condition of certification.
- a. Level 1 Environmental Site Assessment;
 - b. Appraisal;
 - c. Title and document review costs;
 - d. Expenses incurred from other state, federal, or local agency reviews;
 - e. Closing and escrow costs;
 - f. Overhead costs related to providing compensation lands to CDFG or an approved third party;

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- g. Reasonable biological survey(s) to determine mitigation suitability and conformance to selection criteria; and
- h. Agency costs to accept the land (e.g., writing and recording of conservation easements; title transfer).

Compensation Land Habitat Improvement

1. Land Improvement Requirements: The project owner shall fund activities that the CPM, in consultation with BLM, CDFG, and USFWS, determines are required for the initial protection and habitat improvement of the compensation lands. These activities will vary depending on the condition and location of the land, but may include surveys of boundaries and property lines, installation of signs, trash removal and other site cleanup measures, construction and repair of fences, invasive plant removal, closure and removal of roads, gate installation, or other measures to protect and improve habitat quality.
2. The per-acre costs of these activities are estimated in **Biological Resources Table 8** but will vary depending on specific measures that may be required for the compensation lands. A non-profit organization, CDFG or another public agency may hold and expend the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code § 65965), if it meets the approval of the CPM in consultation with CDFG, and if it is authorized to participate in implementing the required activities on the compensation lands. If CDFG takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFG or its designee.

Compensation Land Long-Term Habitat Management

1. Long-term Management Requirements: Long-term habitat management will be required to ensure that the compensation lands are managed and maintained to protect habitat values for the biological resources affected by the project. Management activities may include maintenance of signs, fences, weed removal, habitat or trespass/ land use monitoring, security and enforcement, and control or elimination of unauthorized use.
2. Long-term Habitat Management Plan. The project owner shall prepare and submit a Long-term Habitat Management Plan for the compensation lands for review and approval by the CPM in consultation with BLM, CDFG, and USFWS. The plan shall describe site-specific maintenance and management measures on each proposed compensation parcel.
3. Long-Term Maintenance and Management Funding. The project owner shall fund the long-term maintenance and management of the compensation lands. The amount of required funding is initially estimated as \$1,450 for every acre of compensation lands. The final cost of funding will be determined through an approved PAR or PAR-like analysis of the compensation lands. If compensation lands are not identified and the PAR or PAR-like analysis is not completed within the time period specified for this payment (see the "Verification" subsection at the end of this condition), the project owner shall provide initial payment of ~~\$10,297,260~~ \$10,297,260,234,594 calculated at \$1,450 an acre for ~~7,053.2~~ 7,053.2 acres (i.e., the sum of columns 1 and 4 in Biological Resources

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Table 8; see “Habitat Compensation,” above) into an account for long-term maintenance and management of the compensation lands. The amount of the required initial payment or security for long-term maintenance and management shall be adjusted for any change in the project footprint as described above. Regardless of the amount of an initial payment, the project owner shall deposit additional money as may be needed to provide the full amount of long-term maintenance and management funding indicated by a PAR or PAR-like analysis, once the analysis is completed and approved. Conversely, if the PAR or PAR-like analysis indicates that a smaller amount will be required for long-term maintenance and management, the difference will be returned to the project owner.

The project owner will propose an entity to receive and hold the long-term maintenance and management fund and to manage the compensation lands. The CPM will review the proposed entity in consultation with the project owner and CDFG. The CPM may approve the project owner’s proposed entity or may designate another qualified entity (e.g., a state agency or non-profit organization) to hold the funds and manage the lands.

If CDFG takes fee title to the compensation lands, CDFG shall determine whether it will hold the long-term management fee in a special deposit fund (ii., below), leave the money in the NFWF Account, or designate another entity to manage the long-term maintenance and management fee for CDFG and with CDFG supervision.

The project owner shall ensure that an agreement is in place with the long-term maintenance and management fee holder/manager to ensure the following conditions:

- i. Interest. Interest generated from the initial capital shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the compensation lands, including reasonable administrative overhead, biological monitoring, habitat improvements, law enforcement measures, and any other action approved by CDFG to protect or improve the habitat values of the compensation lands.
- ii. Withdrawal of Principal. The long-term maintenance and management fee principal shall not be drawn upon unless such withdrawal is deemed necessary by the CPM, in consultation with CDFG, or the approved third-party long-term maintenance and management fund manager to ensure the continued viability of biological resources on the compensation lands. If CDFG takes fee title to the compensation lands, monies received by CDFG pursuant to this provision shall be deposited in a special deposit fund established solely for the purpose to manage lands in perpetuity unless CDFG designates NFWF or another entity to manage the long-term maintenance and management fee for CDFG.
- iii. Pooling Funds. A CPM approved non-profit organization qualified to hold long-term maintenance and management funds solely for the purpose to manage lands in perpetuity, may pool the fund with other funds for the operation, management, and protection of the compensation lands. However, for reporting purposes, the Rio Mesa SEGF long-term maintenance and management fund must be tracked and reported individually to the CDFG and CPM.

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- iv. Reimbursement Fund. The project owner shall provide reimbursement to CDFG or an approved third party for reasonable expenses incurred during title, easement, and documentation review; expenses incurred from other state or state-approved federal agency reviews; and overhead related to providing compensation lands.

Compensation Land Security

1. Compensation Land Security: The project owner shall provide security sufficient for funding acquisition, improvement, and long-term management of all compensation lands. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security (“Security”). Prior to submitting the Security to the CPM, the Project owner shall obtain the CPM’s approval, in consultation with BLM, CDFG, and USFWS of the form of the Security.

The security amount shall be based on the habitat estimates provided in **Biological Resources Tables 6 and 9**. This amount shall be updated and verified prior to payment and shall be adjusted to reflect actual costs or more current estimates as agreed upon by the REAT agencies.

The project owner shall provide verification that financial assurances have been established to the CPM with copies of the document(s) to BLM, CDFG and USFWS, to guarantee that adequate funding is available to fully implement all mitigation measures required by condition of certification and recommended **Conditions of Certification BIO-8, BIO-9, BIO-14, and BIO-17**.

In the event that the project owner defaults on the Security, the CPM may use money from the Security solely for implementation of the requirements of this condition. The CPM’s use of the security to implement measures in this condition may not fully satisfy the project owner’s obligations under this condition. Any amount of the Security that is not used to carry out mitigation shall be returned to the project owner upon successful completion of the associated requirements in this condition.

Security for the requirements of this condition shall be provided in the amount as specified in **Biological Resources Table 8**. Regardless of the amount of the security or actual cost of implementation, the project owner shall be responsible for implementing all aspects of this condition.

2. The project owner may elect to comply with some or all of the requirements in this condition by providing funds to implement the requirements into the REAT Account established with NFWF. To use this option, the project owner must make an initial deposit to the REAT Account in an amount equal to the estimated costs of implementing the requirement (as set forth in the “Security” section of this condition, paragraph 1, above). If the actual cost of the acquisition, initial protection and habitat improvements, long-term funding or other cost is more than the estimated amount initially paid by the project owner, the project owner shall make an additional deposit into the REAT Account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, the long-term funding requirements as established in an approved PAR or PAR-like analysis, or the other actual costs that are estimated in the table. If those actual costs or PAR projections are less

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than the amount initially transferred by the applicant, the remaining balance shall be returned to the project owner. In addition, if the project owner elects to use the REAT NFWF account, the project owner also shall fund NFWF fees to establish a project-specific account; manage the sub-account for acquisition and initial site work; and manage the sub-account for long term management and maintenance as shown in **Biological Resources Table 8**.

3. The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM, in consultation with BLM, CDFG, and USFWS, prior to delegation of land acquisition responsibility. Agreements to delegate land acquisition to a third party, or to manage compensation lands, shall be executed and implemented within 18 months of the Energy Commission's certification of the project.
4. The project owner may request the CPM to provide it with all available information about any funds held by the Energy Commission, CDFG, or NFWF as project security, or funds held in a NFWF sub-account for this project, or other project-specific account held by a third party. The CPM shall also fully cooperate with any independent audit that the project owner may choose to perform on any of these funds.

Verification: The mitigation actions required under this condition shall be completed at least 30 days prior to the start of ground-disturbing activities. Or, if these actions are not completed at least 30 days prior to the start of ground-disturbing activities, the following verification schedule requirements shall apply:

1. No later than 30 days prior to beginning project ~~ground-disturbing~~ construction activities: The project owner shall provide verification to the CPM and CDFG that an approved Security has been established in accordance with this condition of certification. Financial assurance may be in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") only as approved the CPM and CDFG. Prior to submitting the Security verification, the project owner shall obtain the CPM's approval of the form of the Security, in consultation with BLM, CDFG, and USFWS.
2. No later than 12 months after the start of ~~ground-disturbing~~ construction project activities: The project owner shall submit a formal acquisition proposal to the CPM describing the parcels intended for purchase or transfer, for CPM review and approval in consultation with BLM, CDFG, and USFWS. If NFWF or another approved third party is handling all or part of the acquisition, the project owner shall fully cooperate with the third party and ensure that funds needed to accomplish the acquisition are transferred in timely manner to facilitate the planned acquisition and to ensure the land can be acquired and transferred prior to the 18-month deadline.
 - a. No later than 60 days after the CPM approves the proposed compensation lands: The project owner shall complete and submit to the CPM a PAR or PAR-like analysis of the anticipated long-term maintenance and management costs of the compensation lands.
 - i. No later than 30 days after the CPM approves the PAR or PAR-like analysis: The project owner shall provide written verification to the CPM, BLM, CDFG, and

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USFWS to confirm that the long-term maintenance and management costs have been fully funded, which funding may be paid from the security required by this condition of certification.

- b. No later than 60 days after the CPM determines the activities required for initial protection and habitat improvement on the compensation lands: The project owner shall make funding available for those activities and shall provide written verification to the CPM of the funds that are available and how the habitat improvement costs will be paid.
 - i. No later than six months after the CPM's determination of the required activities: Initial protection and habitat improvement activities shall be completed, and written verification shall be provided to the CPM.
3. No later than 18 months after the start of project ~~ground-disturbing~~ construction activities: The project owner or an approved third party shall complete the acquisition and all required transfers of the compensation lands, and provide written verification to the CPM, BLM, CDFG, and USFWS.
 - a. No later than 180 days after the land or easement purchase, as determined by the date on the title: The project owner, or an approved third party shall provide the CPM, BLM, CDFG, and USFWS with a draft management plan for the compensation lands. The CPM, in consultation with the other agencies, shall review and approve the management plan upon incorporation of all needed revisions.
4. No later than 90 days after completion of all project related ground disturbance: The project owner shall provide to the CPM, BLM, CDFG, and USFWS a final accounting, based on aerial photography and Geographic Information System (GIS) analysis, of the amount of habitat disturbed during project construction. If this analysis shows that more lands were disturbed than were anticipated, the project owner shall provide the Energy Commission with additional compensation lands and funding commensurate with the added impacts and applicable mitigation ratios set forth in this condition. If the analysis shows that fewer acres were disturbed than were anticipated, then compensation requirements will ~~only be reduced if the deadlines established under this condition for transfer of compensation lands and funding have been met prior to completion of the analysis~~ on a pro rata basis.
4. **Pages 4.2-160 through 4.2-161, BIO-4:** Consistent with Applicant's specific comments and conditions of certification with prior projects, please make the following edits:

BIO-4 The project owner shall prepare and implement a project-specific Worker Environmental Awareness Program (WEAP) and shall secure approval for the WEAP from the CPM in consultation with BLM, CDFG, and USFWS. The WEAP shall be administered to all on-site personnel and agency staff at the solar generator site, and gen-tie line alignment, including but not limited to all surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, and subcontractors. The WEAP shall be implemented throughout project preconstruction, construction, operation, and closure. The WEAP shall:

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1. Be developed by or in consultation with the Designated Biologist and Authorized Desert Tortoise Biologist and consist of a training presentation, printed training material, and electronic media, including photographs of protected species, and be distributed to all participants;
2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas; explain the reasons for protecting these resources; provide information to participants that no snakes, other reptiles, bats, or any other wildlife shall be intentionally harmed or harassed;
3. Place special emphasis on special-status plants, desert tortoise, burrowing owl, golden eagle, ~~nesting birds~~, desert kit fox, and American badger, including information on physical characteristics, distribution, behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures; this information shall also be included in printed training material and electronic media (above);
4. Include a discussion of fire prevention measures to be observed by workers during all project activities; require that workers dispose of cigarettes and cigars in appropriately ~~containers~~ containers;
5. Describe the temporary and permanent habitat protection measures to be implemented at the project site;
6. Identify whom to contact if there are further comments and questions about the material discussed in the program;
7. Prominently display posters and descriptions in offices, conference rooms, employee break rooms, and other areas where employees may congregate, of desert tortoises, burrowing owls, golden eagles, nesting birds, desert kit fox, roosting bats, and American badger, with brief descriptions of behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures;
9. Direct all WEAP trainees to report all observations of listed species or their sign to the Designated Biologist for inclusion in the MCR; and
10. Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines.

The program may be administered by the Designated Biologist or another person as approved by the Designated Biologist.

Verification: At least 30 days prior to the start of any project-related ground disturbance activities, the project owner shall provide the CPM, BLM, CDFG, and USFWS with ~~the~~ a final draft of the WEAP and all supporting written materials and electronic media, ~~as reviewed and approved by the CPM in coordination with the other agencies.~~ Any further modifications to the approved WEAP shall be made only in consultation with the CPM, BLM, CDFG, and USFWS. The project owner also shall submit a resume of each person administering the program.

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The project owner shall provide the names and number of people who have completed the training in each MCR.

Throughout the life of the project, the WEAP shall be repeated annually for permanent employees, and shall be routinely administered within one week of arrival to any new construction, maintenance, or operations personnel, foremen, contractors, subcontractors, and other personnel potentially working within the project area. Upon completion of the training, employees shall sign a form stating that they attended the program and understand all protection measures. These forms shall be maintained by the project owner and shall be made available to the CPM upon request. Workers shall receive and be required to visibly display a hardhat sticker or certificate that they have completed the training.

Training acknowledgement forms signed during construction shall be kept on file by the project owner for at least 6 months after the start of commercial operation. During project operation, signed statements for operational personnel shall be kept on file for 6 months following the termination of an individual's employment.

5. **Page 4.2-161-4.2-168, BIO-5:** Consistent with Applicant's specific comments and conditions of certification with prior projects – much of BIO-5 is redundant and can be deleted:

BIO-5 The project owner shall undertake the following measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to biological resources. All measures shall be subject to review and approval by the CPM.

1. Limit Disturbance Areas and Perimeter Fencing. ~~The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) to clearly delineate the project footprint, boundaries~~ shall be delineated with stakes and flagging in consultation with the Designated Biologist prior to and ground disturbing activities within those areas. All ground disturbance, project vehicles, and equipment shall be confined to the flagged areas. Spoils and topsoil shall be stockpiled in areas already disturbed or to be disturbed by construction, so that stockpile sites do not add to total disturbance footprint. Parking areas, staging and disposal site locations shall similarly be located in areas already disturbed or to be disturbed by construction when possible ~~without native vegetation or special status species habitat~~. Any sensitive biological resource areas within or adjacent to any project work site shall be clearly marked and biology staff shall inspect these areas at appropriate intervals for compliance with regulatory terms and conditions.
2. Minimize Road Impacts. The limits of any new or improved access route shall be clearly marked as above prior to ground disturbance for the access route. All vehicles passing or turning around shall do so within the marked construction disturbance area.
3. Minimize Traffic Impacts. Vehicle and equipment traffic during project construction and operation shall be confined to existing designated routes of travel to and from the project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit shall not exceed 15 miles per hour within any part of the project area, maintenance roads for linear facilities, or unpaved access roads to the project site where desert tortoise clearance surveys and translocations have not been completed.

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- ~~4. Monitor During Construction. Due to the possibility that desert tortoises, especially juveniles, may persist on the site after desert tortoise clearance surveys and exclusion fencing are completed, the biology staff shall be present at the construction site during all clearing, grubbing, or initial grading activities. Biology monitors shall walk immediately ahead of equipment during brushing and grading activities. Any time over the life of the project that a desert tortoise is found within the exclusion fencing, the Designated Biologist or Authorized Desert Tortoise Biologist shall immediately contact the CPM, CDFG, and USFWS; monitor the tortoise's location and activities; and translocate the animal in accordance with the approved Desert Tortoise Translocation Plan, in consultation with the USFWS, CDFG, and CPM.~~
- ~~5. Minimize Impacts of Transmission/Pipeline Alignments, Roads, and Staging Areas. Staging and equipment laydown areas for construction on the solar generator site shall be within the desert tortoise exclusion fencing area. For transmission line construction or other activities outside of the solar generator site, all disturbance areas including access roads, pulling sites and staging, laydown or parking areas shall be designed, installed, and maintained to minimize impacts to native vegetation and wildlife habitat. Biology staff shall evaluate potential for special status biological resources at every potential disturbance site on these project components prior to any construction-related disturbance, including access improvements. Specifically, site selection of any area to be permanently or temporarily disturbed on the gen-tie line alignment or other linear components shall avoid any desert wash, desert microphyll woodland, or any aeolian sand habitat wherever feasible. Where these sites cannot feasibly be avoided, the Designated Biologist shall outline site-specific requirements to minimize impacts to habitat and wildlife. These requirements may include, but would not be limited to, pre-construction clearance surveys, exclusion fencing (e.g., for desert tortoise or Mojave fringe-toed lizard), on-site monitoring, and post-construction remediation.~~
6. Implement APLIC Guidelines. The gen-tie line, all distribution lines, and all other electrical components shall be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLIC's) *Suggested Practices for Avian Protection on Power Lines* (APLIC 2006) and *Mitigating Bird Collisions with Power Lines* (APLIC 1994) to reduce the likelihood of large bird electrocutions and collisions.
- ~~7. Avoid Toxic Substances on Road Surfaces. Soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to wildlife and plants.~~
8. Evaporation Ponds. Prior to any discharge into the evaporation ponds, the project owner shall cover the ponds with 2-cm (about ¾-inch) mesh netting to exclude birds and other wildlife from drinking or landing on the ponds; the netting shall be monitored regularly to verify that it remains intact, functions to exclude birds and other wildlife from the ponds, and does not pose an entanglement threat to birds and other wildlife; the ponds and netting shall be designed and maintained so that the netting does not contact the water.
- ~~9. Minimize Lighting Impacts. Facility lighting shall be designed, installed, and maintained to prevent side casting of light towards wildlife habitat.~~

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10. Minimize Bird Attraction to SRSR Towers. FAA lighting on SRSR towers shall be only red lights with the longest permissible interval between flashes and the shortest permissible flash duration, and with flashes synchronized to increase the flash effect. These shall be red strobe lights if consistent with FAA requirements and staff's recommended Condition of Certification ~~TRANS-8~~ TRANS-7 (Obstruction Marking and Lighting).
11. Minimize Noise Impacts. To minimize disturbance to wildlife nesting or breeding activities in surrounding habitat, loud construction activities (e.g., pile driving, steam blows) shall be avoided to the extent feasible from February 1 to August 31. Loud construction activities may be permitted from February 1 to August 31 only according to the provisions of the Nesting Bird Management Plan (recommended Condition of Certification ~~BIO-1411~~).
- ~~12. Avoid Vehicle Impacts to Desert Tortoise. Parking and equipment storage shall be within the area enclosed by desert tortoise exclusion fencing to the extent feasible. The project owner will coordinate with the Designated Biologist and CPM to locate employee and contractor vehicle parking at designated sites to minimize likelihood of impacts to desert tortoises and need for inspections. No vehicles or construction equipment parked outside the fenced area shall be moved prior to an inspection of the ground beneath the vehicle for the presence of desert tortoise. If a desert tortoise is observed, it shall be left to move on its own. If it does not move within 15 minutes, the Authorized Desert Tortoise Biologist may remove and relocate the animal to a safe location if temperatures are within the range described in the USFWS's (2009a) *Desert Tortoise Field Manual* (http://www.fws.gov/ventura/speciesinfo/protocols_guidelines). All access roads outside of the fenced project footprint shall be delineated with temporary desert tortoise exclusion fencing on either side of the access road, unless otherwise authorized by the CPM, in consultation with BLM, CDFG, and USFWS.~~
- ~~13. Avoid Wildlife Entrapment:~~
 - ~~a. Backfill Trenches. At the end of each work day, biology staff shall ensure that all potential wildlife pitfalls (trenches, bores, temporary detention basins, and other excavations) have been backfilled, covered, or sloped to allow wildlife egress. All potential pitfalls outside the permanent desert tortoise exclusion fencing shall be inspected no less than three times throughout the day and at the end of each workday. All potential pitfalls outside the exclusion fencing will be backfilled, sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, covered completely to prevent wildlife access except as necessary for ongoing project activities. Should a desert tortoise or other wildlife become trapped, the Designated Biologist or Biological Monitor shall remove and, if applicable, relocate it as described in the Desert Tortoise Translocation Plan. In addition, Biology Staff will periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm's way. Any wildlife encountered during the course of construction shall be allowed to leave the construction area unharmed.~~
 - ~~b. Avoid Entrapment of Desert Tortoise. Any construction pipe, culvert, or similar structure with a diameter greater than 3 inches, stored less than 8 inches aboveground for one or more nights, shall be inspected for tortoises before the~~

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material is moved, buried, or capped. As an alternative, all such structures may be capped before being stored outside the fenced area, or placed on pipe racks.

- c. ~~Avoid entrapment of nesting or migratory birds. All pipes or other construction materials or supplies will be covered or capped in storage or laydown areas at the end of each work day. No pipes or tubing of sizes or inside diameters ranging from 1 to 10 inches will be left open either temporarily or permanently.~~

- ~~14. Minimize Standing Water. Standing water could attract desert tortoises, common ravens, and other wildlife to construction sites. Dust abatement on access routes or other areas of the project site shall use the minimal amount of water needed to meet safety and air quality standards to minimize pooling or puddles. Biology staff shall inspect road watering, water tanks, pump sites, and other facilities to ensure water does not pool and shall report standing water to the Designated Biologist for follow up with the project owner's Environmental Compliance Manager (ECM).~~
- ~~15. Dispose of Road-killed Animals. Road-killed animals or other carcasses detected on or near the project area shall be collected and delivered to the biology staff. The Designated Biologist shall retain the carcass in a freezer on-site and contact CDFG within 30 working days for guidance on disposal or storage. For any road-killed special status species, the Biological Monitor shall contact CDFG and USFWS (for golden eagle or federally listed species, including desert tortoise) within one working day of receipt of the carcass for guidance on disposal or storage of the carcass. The Designated Biologist shall report the special status species record to the CNDDDB.~~
- ~~16. Minimize Spills of Hazardous Materials. All vehicles and equipment shall be maintained in proper condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The Designated Biologist shall be informed of any hazardous spills immediately as directed in the project Hazardous Materials Plan. Hazardous spills shall be immediately cleaned up and the contaminated soil shall be properly handled or disposed of at a licensed facility. Servicing of construction equipment shall take place only at a designated area as approved by the CPM. Service and maintenance vehicles shall carry a bucket and pads to absorb leaks or spills.~~
- ~~17. Worker Guidelines. All trash and food-related waste shall be placed in self-closing containers and removed regularly from the site to prevent overflow. Workers shall not feed wildlife or bring pets to the project site. Except for law enforcement personnel, no workers or visitors to the site shall bring firearms or weapons.~~
- ~~18. Erosion Control Measures. Erosion control measures and BMPs shall be taken to minimize erosion and off-site or downstream sediment run-off. All spoils or other materials shall be placed such that heavy rains will not cause materials to wash off-site or into waters of the state. All disturbed soils and roads within the project site shall be stabilized to reduce erosion potential, both during and following construction, except that soil stabilizers may not be used within or adjacent to special status species locations on or off the project site, or on road crossings of washes or stream channels, as consistent with applicable water quality requirements.~~

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- ~~19. Monitor Ground Disturbing Activities Prior to Pre-Construction Site Mobilization. If pre-construction site mobilization requires ground disturbing activities such as geotechnical borings or hazardous waste evaluations, biology staff shall be present to monitor any actions that could affect desert tortoise, or disturb soil, vegetation, or wildlife.~~
20. Remove Unused Material and Equipment. All unused material and equipment, including soil and rock piles, will be removed upon completion of any construction or maintenance activities outside the permanently fenced area.
- ~~21. Control and Regulate Fugitive Dust. To reduce the potential for the transmission of fugitive dust, the project owner shall implement dust control measures as described in staff's recommended Conditions of Certification **AQ-SC4**, **AQ-SC5**, and **AQ-SC7** in the **Air Quality** section of this Staff Assessment.~~

Verification: All mitigation measures listed above and the project owner's proposed methods for implementing them shall be included in the BRMIMP and shall be implemented. Throughout the life of the project, implementation of the measures shall be reported in the MCRs and ACRs by the Designated Biologist. ~~Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how measures have been completed.~~

6. **Pages 4.2-168 through 4.2-170, BIO-6:** Consistent with Applicant's specific comments and conditions of certification with prior projects, please make the following edits:

BIO-6 The project owner shall prepare and implement a Revegetation Plan for all temporary (albeit long-term) project disturbance areas on public land, including work areas on the gen-tie alignment, and primary access road. ~~temporary construction disturbance areas to the east of the solar generator site, and all areas within the solar generator site where underground infrastructure construction, temporary access, temporary lay-down areas, construction equipment staging areas, or other project construction activities caused temporary disturbance to soils and vegetation.~~ Upon completion of construction, all temporarily disturbed areas on public land shall be restored to pre-project grade and topography, or recontoured as needed to prevent surface hydrology alterations from causing undue erosion to the extent reasonably feasible.

Revegetation objectives will be to prevent or minimize further site degradation; stabilize soils; maximize the likelihood of vegetation recovery over time; and minimize soil erosion, dust generation, and weed invasions. The nature of site reclamation, revegetation, or restoration will vary according to each site, its pre-disturbance condition, and the nature of the construction disturbance (e.g., drive and crush, vs. blading). The revegetation plan shall conform to the following requirements:

1. Plan Details. The revegetation plan shall include at minimum: (a) top soil storage and handling methods, if proposed; (b) seed collection guidelines; (c) planting or seeding schedule, to coincide with winter rain season (i.e., seeding prior to mid-December); (d) seeding or planting methods; ~~(e) a description of the irrigation system and irrigation scheduling, if used;~~ (f) measures to control invasive species (to be coordinated with the project's Integrated Weed Management Plan, below); (h) success criteria; and (i) a detailed monitoring program. ~~All Public land habitats dominated by non-native species prior to project disturbance shall be revegetated using appropriate native species to~~

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minimize re-infestation. This plan shall also contain contingency measures for failed revegetation efforts (those not meeting success criteria).

2. Seed and Nursery Stock. Only seed or potted nursery stock of locally occurring native species shall be used for revegetation. Seeds shall contain a mix of short-lived early pioneer species such as native annuals and perennials and subshrubs. Seeding and planting shall be conducted as described in Chapter 5 of *Rehabilitation of Disturbed Lands in California* (Newton and Claassen 2003). A list of plant species suitable for Colorado Desert region revegetation projects, including recommended seed treatments, are included in Appendix A-9 of the same report. The list of plants observed during the special-status plant surveys of the project area can also be used as a guide to site-specific plant selection for revegetation. In conformance with BLM policy, the project owner shall include salvaged or nursery stock yucca (all species), and cacti (excluding cholla species, genus *Cylindropuntia*), in revegetation plans and implementation affecting BLM lands.
3. Monitoring. Revegetation monitoring will be on an annual basis and shall continue for a period of no less than five (5) years or until the defined success criteria are achieved. If the survival and cover requirements have not been met, the project owner will be responsible for replacement seeding or planting to achieve these requirements or other remedial action as agreed to by the CPM in consultation with BLM, CDFG, and USFWS. Remediation sites shall be monitored with the same survival and growth requirements as required for original revegetation. Remediation activities (e.g., additional planting, removal of non-native invasive species, or erosion control) shall be undertaken during the monitoring as necessary to ensure success. If any revegetation site fails to meet the established performance criteria after the maintenance and monitoring period, monitoring and remedial activities shall extend until the criteria are met or unless otherwise specified by the CPM in consultation with BLM, CDFG, and USFWS.
4. ~~Replacement. If a fire occurs in a revegetation area within the monitoring period, the owner shall be responsible for a one-time replacement. If a second fire occurs, no replanting is required, unless the fire is caused by the owner's activity (e.g., as determined by BLM or other firefighting agency investigation).~~

Verification: At least 30 days prior to the start of any project-related ground disturbance activities, the project owner shall provide the CPM, ~~and BLM, CDFG, and USFWS~~ with the a final draft of the Revegetation Plan for public land, as reviewed and approved by the CPM in coordination with the other agencies. Any further modifications to the approved Revegetation Plan shall be made only in consultation with the CPM, ~~and BLM, CDFG, and USFWS~~. The project owner shall include all revegetation and monitoring activities in the ACRs submitted to the CPM. The report shall include: a summary of revegetation, monitoring, and remediation activities for the year; a discussion of whether revegetation performance standards for the year were met; and recommendations for remedial action, if warranted, planned for the upcoming year.

7. **Pages 4.2-168 through 4.2-170, BIO-7:** Consistent with Applicant's specific comments and conditions of certification with prior projects, please make the following edits to items 1 and 5 in the condition:

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1. An assessment of nonnative and invasive weeds occurring on the site and within a ~~one-mile~~250-foot adjacent buffer area prior to construction activities;
- ...
5. An action or mobilization plan to ensure timely and appropriate control or eradication of infestations before they go to seed, to prevent further expansion; treatment of weed infestations shall occur at least once annually; when no new seedlings or resprouts are observed at treated sites for three consecutive normal rainfall years, the infestation can be considered eradicated and weed control efforts may cease for that impact site; control methods shall meet the following criteria:
 - a. Manual. Well-timed removal of plants or seed heads with hand tools; seed heads and plants must be disposed of in accordance with ~~guidelines from the Riverside County Agricultural Commissioner~~ invasive weed guidance;
 - b. Chemical. Only state and BLM-approved herbicides will be used, and all herbicide applicators will possess a qualified herbicide applicator license from the state; all herbicide applications will be in accordance with federal, state, and local laws and regulations follow U.S. Environmental Protection Agency label instructions; herbicides having residual toxicity, such as preemergents and pelts, shall not be used in natural areas or within channels (engineered or not) where they could run off into downstream areas. Appropriate methods of chemical control will be specified in the weed management plan. Only the following application methods may be used: wick (wiping onto leaves); inner bark injection; cut stump; frill or hack & squirt (into cuts in the trunk); basal bark girdling; foliar spot spraying with backpack sprayers or pump sprayers at low pressure or with a shield attachment to control drift, and only on windless days, or with a squeeze bottle for small infestations;
8. **Pages 4.2-170 through 4.2-172, BIO-8:** Consistent with Applicant's specific comments and conditions of certification with prior projects, please delete BIO-8 in its entirety:

~~DESERT DRY WASH WOODLAND MONITORING PLAN AND OFF-SITE IMPACT COMPENSATION~~

~~**BIO-8** — The project owner shall prepare and implement a Desert Dry Wash Woodland Monitoring Plan (DDWWMP) upon review and approval by the CPM, in consultation with BLM, CDFG, and USFWS. The project owner shall not commence project related groundwater pumping until the plan has been revised and approved by the CPM in consultation with the other agencies. The Plan shall outline the following information and actions:~~

- ~~1. — Prior to project operations, the baseline health and vigor of groundwater dependent plant species (desert ironwood, blue palo verde, mesquite, and bush seepweed) shall be recorded within four zones: immediately off-site at the eastern project boundary, and at ¼-mile, ½-mile and 1-mile distances from proposed project groundwater supply well locations. At least one "control" site, at least 2 miles from the supply well locations, shall also be sampled. The number of plants for each of the target species to be~~

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- sampled at each site will be large enough to provide valid comparison of data among sites. The DDWWMP will provide maps and text description of each study site.
2. A qualified botanist or plant physiologist shall develop a sampling protocol to be carried out at each sampling zone (above) and the control site to monitor stress and mortality of target plants once operations begin. The protocol shall include a measure of pre-dawn water potential, as measured by standard plant physiology techniques.
 3. The DDWWMP shall identify thresholds constituting a significant difference in plant stress or mortality. If a significant difference in plant stress or mortality is shown at one or more sample locations in comparison to the control site, the project owner shall coordinate with the CPM, BLM, CDFG, and USFWS to interpret the results. The sample site and control site data shall be evaluated in terms of the project's groundwater usage, climate factors, and groundwater monitoring data collected for staff's recommended Condition of Certification **WATER SUPPLY 4**. If plant stress or mortality is determined to be related to project activities, then the project owner shall either refrain from pumping, reduce groundwater pumping to allow for recovery of the groundwater table, or provide additional habitat compensation as described below.

If results of the groundwater monitoring program under **WATER SUPPLY 4** indicate that the project pumping has resulted in groundwater level decline of 1 foot or more below the baseline trend, and vegetation monitoring for plant stress, mortality, and water potential have documented one or more of the sampling sites for the four groundwater-dependent plant species as reaching the threshold (above), the project owner will reduce groundwater pumping until water levels stabilize or recover, provide for temporary supplemental watering, or compensate for additional impacts to desert dry wash woodland (blue palo verde-ironwood woodland) at the ratio of 3:1, consistent with Condition of Certification **BIO 3**. Estimated acreage of additional dry wash woodland impacts will be submitted to the CPM for review in consultation with BLM, CDFG, and USFWS for approval. Upon approval, the project owner will initiate and complete further compensation according to the requirements and conditions described in **BIO 3**.

At the conclusion of the monitoring period (i.e., throughout construction phase and for an additional three (3) years following completion of project construction), the project owner, CPM, BLM, CDFG, and USFWS shall jointly evaluate the effectiveness of the DDWWMP and determine if monitoring frequencies or procedures should be revised, extended to the operation and decommissioning periods, or eliminated. Should additional data be forthcoming to demonstrate that this potential impact is not verifiable or attributable to this specific project, it may be modified or eliminated.

Verification: At least 30 days prior to the start of any project-related ground disturbance activities, the project owner shall provide the CPM, BLM, CDFG, and USFWS with the a final draft of the DDWWMP, as reviewed and approved by the CPM in coordination with the other agencies. Any further modifications to the approved DDWWMP shall be made only in consultation with the CPM, BLM, CDFG, and USFWS. Results of desert dry wash woodland monitoring will be submitted to the CPM in MCRs and ACRs throughout the project's construction period and for no fewer than three (3) additional years following the completion of construction. The reports will include all monitoring data required as part of the monitoring program requirements under **WATER SUPPLY 4** and as required under this condition including evaluation and any changes in plant health and vigor, and changes in groundwater levels in the production and monitoring wells. If the project owner elects to

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mitigate potential future impacts through acquisition of compensation habitat, then all terms and measures of Condition of Certification **BIO-3**, including schedule requirements, submittal and acceptance of a formal acquisition proposal, completion of the required transactions, and verification of completion for each term or condition, shall apply to the verification of this condition, except that transaction and management schedule requirements will be adjusted to begin on the date of the CPM's approval of the acreage impacts.

9. **Page 4.2-172-4.2-177, BIO-9:** Please revise to conform with the pending LSAA and up-to-date delineation filed by Applicant. Further, Applicant has proposed revisions to correct double-counting of vegetation impacts. Please revise items 1 and 2 in the condition as follows:

BIO-9 The project owner shall implement the following measures to avoid, minimize and mitigate for direct and indirect impacts to waters of the state and to satisfy requirements of California Fish and Game Code sections 1600 and 1607.

1. Finalize Acreages of Impacts to State Waters: The applicant estimates that ~~817.37486.12~~ 817.37486.12 acres of state-jurisdictional waters would be directly or indirectly impacted by the project, and staff's recommended compensation is based on that estimate. Upon completion of final engineering, the project owner shall review and quantify the project's permanent and long-term impacts to state-jurisdictional waters. The calculated acreage of permanent and long-term impacts shall include all ephemeral drainages within or adjacent to the fenced boundary of the solar generator site; the adjacent temporary construction area; and all impacts to streambeds or adjacent riparian vegetation resulting on the gen-tie alignment, including construction or widening of the access road; transmission line tower access; logistics, staging, and lay-down areas; road turnouts; pull sites; and any other project-related disturbance to state jurisdictional waters.
2. Acquire Off-Site State Waters: Permanent and long-term impacts to unvegetated waters of the state shall be offset by compensation at a ~~3:1~~ 3:1 ratio and vegetated waters of the state will be mitigated at 3:1. The project owner shall acquire, in fee or in easement, a parcel or parcels of land that includes ~~2,452.14~~ 1387.52 acres of state jurisdictional waters, including ephemeral streambeds and adjacent riparian vegetation. The parcel or parcels comprising the off-site state waters shall include similar vegetation and habitat types as those found on the project site, including blue palo verde – ironwood woodland, ~~and~~ bush seepweed scrub, and mesquite bosque scrub. Total acreage of these vegetation types shall be at the 3:1 ratio as described for special status plant community compensation in staff's recommended Condition of Certification **BIO-3**. The terms and conditions of this acquisition or easement shall be as described in Condition of Certification **BIO-3**. Compensation lands for offset of impacts to state waters shall be located within the surrounding watersheds, as close to the project site as possible. State waters on other compensation lands, such as desert tortoise compensation lands (see Condition of Certification **BIO-11**) may fully or partially fulfill the requirements of this condition. Additional off-site state

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waters shall be acquired if those compensation lands do not include the necessary acreage of state waters as required for compliance with this condition of certification.

10. **Page 4.2-177-4.2-181, BIO-10:** Consistent with Applicant's specific comments and conditions of certification with prior projects, please make the following edits to items 1, 2 and 3 of the condition:

BIO-10 Through implementation of standard measures in the BRMIMP and Weed Management Plan, ~~the project owner shall~~ will implement the following measures to mitigate the project's direct and indirect impacts to special-status plants.

1. **Special Status Plant Impact Avoidance and Minimization.** To protect Harwood's milk-vetch or other CRPR 1 or 2 plants located within the project area or within 250 feet of its boundaries (including access roads, staging areas, laydown areas, parking and storage areas) from accidental and indirect impacts during construction, operation, and closure, the project owner shall avoid special-status plant locations to the extent feasible. Any CRPR 1 or 2 plant locations, excluding Abram's Spurge, and a surrounding 250-foot buffer area shall be designated as "environmentally sensitive areas" and avoided during all project activities to the extent feasible. Project design or grading plan modifications to avoid special-status plant locations shall be clearly depicted on the grading and construction plans, and on report-sized maps in the BRMIMP, with notations indicating avoidance requirements. These special-status plant locations shall be marked and monitored as environmentally sensitive areas as described in Condition of Certification **BIO-5.** Erosion and sediment control measures shall be taken to avoid adverse impacts to the sites.

"Avoidance" shall include protection of the ecosystem processes essential for maintenance of the protected plant occurrence. For all but one of the late blooming plant species with potential to occur, the plant species are annuals that depend on a viable seed bank to maintain population health and persistence. The primary goal of avoidance for these annual species will be protection of the soil integrity and the seed bank that is closely associated with undisturbed soils. Any impacts to the soil structure or surface features will be considered an impact, but measures like temporary mowing or brush removal that does not disturb the soil will not be considered impacts to the population.

2. **Seed Salvage.** For all direct impacts to CRPR 1 or 2, excluding Abram's Spurge, plants for which avoidance is not feasible, mitigation shall include seed collection from the affected special-status plants on-site prior to construction to conserve the germplasm and provide a seed source for potential future restoration efforts. Where construction schedules or seed availability prevents seed collection, seed must be collected from another portion of the project site or from public or applicant-owned lands off-site. Seed collection on public land must only be done under permit from the BLM; the project owner shall be responsible for obtaining and complying with applicable permit(s). The seed shall be collected under the supervision or guidance of a reputable seed storage facility such as the Rancho Santa Ana Botanical Garden (RSABG) Seed Conservation Program, San Diego Natural History Museum, or the Missouri Botanical Garden. The costs associated with the long-term storage of the seed shall be the responsibility of the project owner. Any efforts to propagate and reintroduce special-

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status plants from seeds in the wild shall be carried out under the direct supervision of specialists such as those listed above.

3. **Mitigation of Unavoidable Impacts to Special-status Plants.** The project owner shall mitigate impacts to any CRPR 1 or 2, excluding Abram's Spurge, ranked plants, including plants that may be discovered during summer 2012 field surveys, through one or a combination of the following strategies.

- a. Off-site compensation. The project owner may provide compensation lands consisting of occupied habitat of the affected CRPR 1 or 2, excluding Abram's Spurge, ranked plants, at a 1:1 ratio for any occupied habitat affected by the project. Compensation lands shall be secured according to all terms described in Condition of Certification **BIO-3**. Selection criteria and acreage for special-status plant compensation lands shall be as follows.

11. **Page 4.2-181 through 4.2-183, BIO-11:** Consistent with Applicant's specific comments and conditions of certification with prior projects, please make the following edits:

BIO-11 The project owner shall implement the measures described in this condition to avoid impacts to nesting birds throughout the construction, ~~operations, and closure~~ phases of the project.

1. The project owner shall prepare and implement a Nesting Bird Management Plan (NBMP), describing measures to detect native birds that may nest on the project site or facilities, and avoid impacts or take of those birds or their nests, ~~during all project phases~~. The NBMP shall describe avoidance measures, such as buffer distances from active nests, based on the specific nature of project activities, noise or other disturbance of those activities, the bird species and conservation status, and other pertinent factors including such measures as capping heliostat pipes and installation of anti-perching devices on heliostats. The NBMP may be incorporated into the Bird and Bat Conservation Strategy (Condition of Certification **BIO-12**) as a separate chapter. The plan shall include, at minimum, the following measures and components:
 - a. Define the start and end dates of the local bird nesting season (tentatively defined as ~~January~~ February 15 through August 31);
 - b. Specify nest survey timing and areas in relation to construction activity and survey area (tentatively no more than 7 days prior to construction and throughout all disturbance areas and surrounding ~~500~~100 foot buffer);
 - c. Specify ~~330~~100 feet as a general buffer distance, and ~~500~~200 feet for raptor species, to be adjusted according to bird species (or groups of species) that are relatively tolerant or intolerant of human activities and nature of construction activity or disturbance;
 - d. ~~List all project construction activities and rank them in terms of noise and other disturbance to nesting birds, and specify any modifications to buffer areas as appropriate to each activity; for example, vehicle travel along an access route would likely warrant reduced buffers whereas pile driving may necessitate increased distances;~~
 - e. ~~Specific project activities and bird species (or groups of species) that may warrant temporary buffer reductions or nest relocation with on-site nest monitoring by a qualified field ornithologist during any such activities;~~

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- f. Specific monitoring measures to track any active bird nest within or adjacent to the project site, bird nesting activity, ~~and project-related disturbance, and fate of each nest;~~
 - g. Specific data management and reporting procedures, to include annual evaluation of buffer distance efficacy and other plan components, and recommendations for revisions for the upcoming nesting season;
 - h. Specific measures to prevent or reduce bird nesting activity on project facilities, construction equipment, ~~or operation and maintenance equipment throughout the life of the project;~~ and
 - i. Specific actions to be taken if a bird nest is located on project facilities, construction equipment, ~~or operation and maintenance equipment throughout the life of the project.~~
2. Pre-construction nest surveys for all bird species ~~including other than~~ burrowing owls shall be conducted if ~~prior to any~~ construction activities will occur ~~scheduled~~ during the breeding period (from ~~January 15~~ February 1 through August 31). Burrowing owl surveys are addressed in **BIO-17**. Biology staff or contractors conducting the surveys shall be experienced field ornithologists and familiar with standard nest-locating techniques such as those described by Martin and Guepel (1993). Surveys shall be in accordance with the following guidelines. Nothing in this condition requires the project owner to conduct nesting bird surveys by entering non-federal lands adjacent to the project site when the project owner has made reasonable attempts to obtain permission to enter the property for survey work but was unable to obtain such permission. In this situation only, the project owner may substitute binocular surveys for protocol field surveys.
- a. Surveys shall cover all potential nesting habitat in the project site and within 500100 feet of the boundaries of the solar generator site, gen-tie alignment, and any other work sites, except as specified in the approved NBMP;
 - b. Except as specified in the approved NBMP, at least two pre-construction surveys shall be conducted, separated by a minimum 10-day interval; the second survey shall be no more than 7 days prior to the start of clearing or construction activity; follow-up surveys shall be required if construction inactivity in any given area exceeds one week, an interval during which birds may build and occupy a nest;
 - c. If active nests are found during the survey, buffer zones and other measures as specified in the approved NBMP shall be implemented; and
 - d. Project biology staff shall monitor the nest until nestlings have fledged and dispersed or until nest failure is documented; monitoring and reporting shall be as specified in the NBMP.

Verification: At least 30 days prior to the start of any project-related ground disturbance activities, the project owner shall provide the CPM, BLM, CDFG, and USFWS with the a final draft of the NBMP, as reviewed and approved by the CPM in coordination with the other agencies. Any further modifications to the approved NBMP shall be made only in consultation with the CPM, BLM, CDFG, and USFWS. Results of nest monitoring will be submitted to the CPM in MCRs ~~and ACRs~~ throughout the project's construction, ~~operations,~~ and ~~closure~~. The Reports will include all monitoring data required as part of the monitoring program. Prior to the start of project-related ground disturbance activities at any work site or project phase, the project owner shall provide the CPM with written or verbal description of survey methods and results, including the time, date, and duration of the survey; identity and qualifications of the surveyor(s); and a list of species observed. If active nests are detected during the survey, the report shall include a map or aerial photo identifying the

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location of the nest(s) and shall depict the boundaries of the no-disturbance buffer zone around the nest(s).

12. **Pages 4.2-183 through 4.2-185, BIO-12:** Please revise to conform to specific comments. Please revise to delete reference to an Eagle Conservation Plan (ECP), which applies only to wind energy, and also presupposes impacts that are not expected to occur, and revise to incorporate the functionally same substantive requirements in the Bird Conservation Strategy:

BIO-12 The project owner shall implement the following measures to monitor, mitigate and adaptively manage operational impacts to birds and bats.

1. **Monitoring Study:** The project owner shall prepare and implement a monitoring study to monitor the death and injury of birds and bats caused by collisions with project facilities including heliostats and solar receiver tower, burning or other injury caused by flying through concentrated solar energy within the solar field, or other project-related causes including the gen-tie line and evaporation ponds. The study design shall be based on the USFWS's *Monitoring Migratory Bird Take at Solar Power Facilities: An Experimental Approach* (USFWS 2011d) or more current guidelines if available. It shall be subject to review and approval by the CPM in consultation with CDFG and USFWS, shall be incorporated into the project's BBCS and BRMIMP, and implemented by the Designated Biologist in coordination with the project owner, CPM, CDFG, and USFWS. The study shall be implemented, for a period of not less than 5 years (60 months) total, including the entire construction phase and not less than 2 years during the operational phase and shall continue until the CPM concludes, in consultation with the other agencies, that the cumulative monitoring data provide sufficient basis for estimating long-term bird mortality for the project.
2. **Bird and Bat Conservation Strategy (BBCS):** The project owner shall prepare and implement a Bird and Bat Conservation Strategy adopting **BIO-16**, and all applicable guidelines recommended by the USFWS (2010c) or more current guidelines that may be released. The BBCS will describe all proposed measures to minimize death and injury of birds or bats from (1) collisions with facility features including the heliostats, power towers, and gen-tie line towers or transmission lines and (2) concentrated solar energy (flux) present between the heliostats and each solar receiver tower and shall incorporate an analysis of golden eagles that includes the following:
3. (a) all applicable golden eagle occurrence analysis guidelines recommended by the USFWS (2011b) or more current guidelines that may be released; ~~The ECP may be prepared as a stand-alone document or it may be included as a chapter within the BCS. The ECP shall describe~~ (b) all available baseline data on golden eagle occurrence, seasonality, activity, and behavior throughout the project area and vicinity; ~~The ECP shall outline~~ (c) a study protocol as may be required or necessary to include additional pedestrian and/or helicopter surveys of golden eagle breeding sites within a 10 mile radius of the project site, to be reviewed and approved by the CPM, in consultation with the USFWS; ~~(d) a description of~~ (d) a description of all proposed measures to minimize death or injury to eagles from (1) collisions with facility features including the heliostats, power towers, and gen-tie line towers or transmission lines, electrocutions on transmission lines or other project components, and ~~(3) concentrated solar energy (radiant flux) over the solar field;~~ (e) The ECP shall specify the project owner's anticipated take of bald or golden eagles (if any). The ECP shall if required or necessary, provide an inventory of existing electrical distribution lines within a 20-mile radius of the

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project site that do not conform to APLIC (2006) design standards to prevent golden eagle electrocution in a manner consistent with FWS guidelines and practice; and shall The inventory shall identify the owner or operator and estimate the number of non-conforming poles for each distribution line. The ECP shall specify that for each anticipated project related take of a bald eagle, golden eagle, Swainson's hawk, or other large special status raptor (including but not limited to osprey, ferruginous hawk, Harris' hawk, norther harrier, prairie falcon, and peregrine falcon, retrofit 11 utility poles per year will be retrofitted to APLIC standards for the life of the project; In addition, the ECP shall specify that 11 utility poles per year will be retrofitted to APLIC standards for the life of the project for each take of a bald eagle, golden eagle, Swainson's hawk, or any other large special status raptor that may exceed the estimated take (even if estimated take is zero). The ECP shall (f) include any feasible modifications to proposed plant operation to avoid or minimize focusing heliostats at standby points and, instead, move heliostats into a stowed position or another alternative configuration when the power plant is in standby mode; (g). ~~The ECP also shall identify any additional feasible adaptive management measures to minimize collisions and exposure to solar flux; and (h).~~ The ECP shall provide a reporting schedule for all monitoring or other activities related to bird or bat conservation or protection to be taken during project construction or operation. The ~~ECP-BBCS~~ shall be subject to review and approval by the CPM in consultation with CDFG and USFWS, and shall be incorporated into the project's BRMIMP, and implemented.

Verification: The draft Monitoring Study, BBCS ~~and ECP~~ shall be submitted to the CPM for review in consultation with CDFG, and USFWS, and shall be finalized by the project owner and submitted to the CPM and other agencies no less than 30 days prior to construction At least 30 days prior to the start of any project-related ground disturbance activities, the project owner shall provide the CPM, CDFG, and USFWS with the a final draft of all three documents, as reviewed and approved by the CPM in coordination with the other agencies. The project owner shall obtain the CPM's written approval of the Monitoring Study, and BBCS ~~and ECP~~ prior to the start of any project-related ground disturbance activities.

The project owner shall provide the CPM with copies of any written or electronic transmittal from the USFWS indicating the status of Monitoring Study, and BBCS ~~and ECP~~ review and any permit that may be required, and any follow-up actions required by the applicant, within 30 days of receiving such transmittal from USFWS.

Methods and results of the Monitoring Study shall be submitted to the CPM in MCRs and ACRs throughout the course of the study and until the CPM, in consultation with the other agencies, concludes that the cumulative monitoring data provide sufficient basis for estimating long-term bird mortality for the project. The Reports will include all monitoring data required as part of the monitoring program.

Each year throughout the minimum 5 year monitoring period, the Designated Biologist shall submit an Annual Report to the CPM, CDFG, and USFWS by January 31 of each calendar year, summarizing all available bird and bat mortality data (species, date and location collected, evidence of injury and cause of death) collected over the course of the year. The report shall provide any recommendations for future monitoring and adaptive management actions. The

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report also shall summarize any additional wildlife mortality or injury documented on the project site during the year, regardless of cause. The Annual Report shall be subject to review and approval by the CPM in consultation with CDFG and USFWS. The project owner shall submit revisions within 30 days of receiving written comments from the CPM. At the direction of the CPM, in consultation with the other agencies, the study period will be extended based on data quality and sufficiency for analysis or if needed to document efficacy of any adaptive management measures undertaken by the project owner. If a carcass of a golden eagle or any state or federally listed threatened or endangered species is found at any time, the project owner or Designated Biologist shall contact CDFG and USFWS within one working day of receipt of the carcass to report the mortality and for guidance on disposal or storage of the carcass.

13. **Page 4.2-185-4.2-189, BIO-13:** Consistent with Applicant's specific comments and conditions of certification with prior projects, please make the following edits:

BIO-13 The project owner shall avoid and minimize impacts to desert tortoises on the project site by (1) fencing the solar generator site to prevent tortoises from entering it during construction, operation, or decommissioning; (2) removing all tortoises from the site prior to initiating construction; and (3) translocating tortoises to an appropriate off-site location to be identified in a Translocation Plan. Methods for clearance surveys, fence specification and installation, tortoise handling, artificial burrow construction, egg handling, and other procedures shall be consistent with those described in the USFWS (2009a) *Desert Tortoise Field Manual* (http://www.fws.gov/ventura/species_information/protocols_guidelines) or more current guidance provided by CDFG and USFWS. The project owner shall also implement all terms and conditions described in the Biological Opinion for the project, to be prepared by USFWS. Applicable conditions and requirements include, but are not limited to, the following:

1. Desert Tortoise Translocation Plan. The project owner shall prepare and implement a Desert Tortoise Translocation Plan in conformance with standards and guidelines described in Translocation of Desert Tortoises (Mojave Population) From Project Sites: Plan Development Guidance (USFWS 2010d) or more current guidance or recommendations as available from CDFG or USFWS, and meets the approval of the CPM in consultation with BLM, CDFG, and USFWS. The goals of the plan shall be to safely exclude desert tortoises from within the project area, translocate them to appropriate locations off site, and minimize stress and potential for disease transmission. For tortoises that may be found along the gen-tie line, the plan's goal will be to avoid impacts through construction monitoring, allowing the tortoise to leave the work area, moving it out of harm's way if necessary, and avoiding disturbance to tortoise burrows through re-siting work sites and structures. The plan shall include all protocols for handling desert tortoises, evaluating tortoise health, translocation locations and procedures, monitoring methods for translocated tortoises, reporting, and contingency planning (e.g., handling an injured or diseased tortoise).
2. Handling of Desert Tortoises. Any desert tortoise located during any phase of the project shall be handled only by the Authorized Desert Tortoise Biologist in accordance with the USFWS (2009a) *Desert Tortoise Field Manual* and the project's Desert Tortoise Translocation Plan. Any time a tortoise is handled, the Authorized Desert Tortoise Biologist shall record and report pertinent data, in accordance with the final Desert

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Tortoise Translocation Plan. Monitoring of translocated desert tortoise shall be in accordance with the Desert Tortoise Translocation Plan and USFWS (2010d) guidance.

3. Desert Tortoise Exclusion Fence Installation. ~~Permanent~~ Desert tortoise exclusion fencing shall be installed around the project site. Temporary tortoise fencing may be installed or monitoring may be used prior to the installation of permanent fencing subject to the approval of the CPM. The alignments for all desert tortoise exclusion fencing shall be prominently flagged or staked and shall be surveyed for desert tortoise by project biology staff no more than 24 hours prior to the initiation of fence construction. The fence alignment surveys shall be conducted using techniques approved by the USFWS and CDFG and may be conducted in any season according to specification in the Desert Tortoise Translocation Plan. The fence alignment clearance surveys shall provide 100 percent coverage of all areas to be disturbed and an additional buffer approximately ~~60~~ 90 feet wide centered on the fence alignment (i.e., ~~45~~ 30 feet along each side of the fence line). Survey transects for fence installation shall be no greater than ~~15~~ 30 feet apart. All potential desert tortoise burrows shall be examined to assess occupancy by desert tortoises.
 - a. Timing of Fence Installation. The exclusion fencing shall be installed prior to the pre-construction clearance surveys. Fencing may be installed during any time of the year. No ground-disturbing activity will be permitted within the fenced area until completion of the pre-construction clearance surveys. If the project is constructed in phases, prior to the initiation of construction activities for each solar plant, the project owner shall enclose the boundary of the affected solar plant with permanent chain link fencing for security purposes and permanent desert tortoise exclusion fencing.
 - b. Fence Material and Installation. The exclusion fencing shall be constructed in accordance with the USFWS (2009a) *Desert Tortoise Field Manual* (Chapter 8 – Desert Tortoise Exclusion Fence).
 - c. Temporary Construction Activities: Temporary construction activities outside of the permanent fencing shall be temporarily fenced to fully encompass work area prior to ground disturbing activities to prevent desert tortoise entry during construction unless biological monitoring is more beneficial to desert tortoise or other wildlife. Temporary fencing must be capable of preventing desert tortoises from entering the work area, with supporting stakes sufficiently spaced to maintain fence integrity. The Designated Biologist or Biological Monitor shall be present to supervise all construction activities occurring within areas bounded by temporary fencing.
 - d. Security Gates. Security gates shall be designed with minimal ground clearance to prevent entry by tortoises. The gates ~~should~~ may be electronically activated to open and close immediately after the vehicle(s) have entered or exited to prevent the gates from being kept open for long periods of time. ~~Cattle-grating~~ Tortoise guards designed to safely exclude desert tortoise may be installed at the gated entries to discourage tortoises from gaining entry (to be determined by the CPM in consultation with BLM, CDFG and USFWS).
 - e. Fence Inspections. The exclusion fencing shall be regularly inspected daily during project construction. Any fencing, whether temporary or permanent, that is installed when tortoises are active, will be checked 2 to 3 times daily for 2 weeks to

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ensure that no tortoise is fence-walking to the point of exhaustion or overexposure. If midday temperatures are above thresholds at which tortoises must go underground to escape heat (approximately 42°C ground temperature), then one of the fence checks should occur prior to this threshold being reached. This same process should occur for the first 2 to 3 weeks of the activity season if the fence is installed in winter, when tortoises are underground. ~~If tortoises were moved out of harm's way during fence construction, fencing in that area shall be inspected at least twice daily for a minimum of 7 days after moving the animal to ensure that the recently moved tortoise is not walking the fenceline.~~ During operations, fencing shall be inspected monthly and within 24 hours following all major rains. Major rains are defined as a storm(s) for which surface flow is detectable within the fenced drainages. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises from entering the site, and permanently repaired within 48 hours of observing damage. Monthly and post-rainfall inspections of permanent site fencing shall continue throughout the life of the project. Carcasses of animals entrapped in the fence shall be handled as described above in **BIO-5**.

- f. Temporary Exclusion Fencing. Any project activities during the life of the project within desert tortoise habitat but outside of the permanently fenced site, and have the potential to disturb native soils or vegetation, shall be subject to fencing and pre-construction clearing survey requirements, or shall take place only while project Biology Staff is on-site. Temporary tortoise exclusion fencing may be placed on access roads or other work sites, including gen-tie line construction sites, in accordance with direction from the CPM in consultation with BLM, CDFG, and USFWS. The fence installation shall be supervised by the Authorized Desert Tortoise Biologist and monitored by project biology staff to ensure the safety of any tortoise present. Temporary fencing shall be inspected weekly and, where drainages intersect the fencing, during and within 24 hours following major rains. All temporary fencing shall be repaired immediately upon discovery of damage, and project biology staff shall inspect the area to determine whether the damage may have permitted tortoise entry.
4. Desert Tortoise Clearance Surveys. Following construction of the tortoise exclusion fencing, the fenced area (~~including permanent and temporarily fenced areas~~) shall be cleared of tortoises by the Authorized Desert Tortoise Biologist and project biology staff. Clearance surveys shall be conducted in accordance with the USFWS 2009a *Desert Tortoise Field Manual* (Chapter 6 – Clearance Survey Protocol for the Desert Tortoise – Mojave Population) and shall consist of at least ~~two~~three surveys covering 100 percent of the enclosed area by walking transects no more than 15 feet apart on the initial clearance survey. Subsequent clearance surveys shall be conducted with transects at no more than 30 feet apart. Surveys shall be repeated until two consecutive 100 percent coverage surveys are completed without finding live tortoises. Any tortoise located during clearance surveys shall be relocated ~~and monitored~~ in accordance with the Desert Tortoise Translocation Plan.
5. Burrow Searches. During clearance surveys all desert tortoise burrows and burrows constructed by other species that might be used by desert tortoises, shall be examined by the Authorized Desert Tortoise Biologist to assess occupancy by desert tortoises and handled in accordance with the USFWS' 2009a *Desert Tortoise Field Manual*. ~~To prevent~~

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~~reentry by a tortoise or other wildlife, a~~ All confirmed non-active burrows shall be collapsed. ~~once absence has been determined.~~ Tortoises taken from burrows shall be translocated as described in the Desert Tortoise Translocation Plan.

6. Monitoring Following Clearing. Following the desert tortoise clearance surveys, the Authorized Desert Tortoise Biologist and project biology staff shall monitor initial clearing and grading activities to find and translocate any tortoises which may have been missed during the clearance survey. Should a tortoise be discovered, it shall be translocated as described in the Desert Tortoise Translocation Plan ~~to an area approved by the Authorized Desert Tortoise Biologist in consultation with the CPM and wildlife agencies.~~ Any time over the life of the project that a desert tortoise is found within the exclusion fencing, the Authorized Desert Tortoise Biologist shall immediately contact the CPM, BLM, CDFG, and USFWS; ~~monitor the tortoise's location and activities; and implement~~ translocation of the animal in accordance with and the approved Desert Tortoise Translocation Plan ~~and in consultation with the CPM and other agencies.~~
7. Relocation of Other Special-Status Species. Wherever feasible and safe, any special-status mammal or reptile incidentally encountered during desert tortoise clearance surveys or monitoring shall be actively or passively relocated outside the exclusion fencing.

The draft Desert Tortoise Translocation Plan shall be submitted to the CPM for review in consultation with BLM, CDFG, and USFWS, and shall be finalized by the project owner and submitted to the CPM and other agencies no less than 30 days prior to construction. At least 30 days prior to the start of any project-related ground disturbance activities, the project owner shall provide the CPM, BLM, CDFG, and USFWS with the a final draft of the plan, as reviewed and approved by the CPM in coordination with the other agencies. The project owner shall obtain the CPM's written approval of the plan prior to the start of any project-related ground disturbance activities. All measures and their implementation methods in the Desert Tortoise Translocation Plan shall be included in the BRMIMP and implemented by the project owner.

All implementation of the Desert Tortoise Translocation Plan shall be reported in the MCRs and ACRs submitted by the project owner to the CPM. Within 30 days after completion of desert tortoise clearance surveys and translocation, the Designated Biologist shall submit a Desert Tortoise Clearance Survey, Exclusion Fencing, and Translocation Report to the CPM, BLM, CDFG, and USFWS, describing methods and results of the fencing, clearance surveys, and translocation (if any). The report will also document any other animals relocated during the clearance surveys.

14. **Page 4.2-189-4.2-190, BIO-14:** Consistent with Applicant's specific comments and conditions of certification for prior projects, please make the following edits. Additionally, compensatory mitigation land should not be precluded from being the same quality of habitat impacted by the project. Please revise as follows:

BIO- 14 The project owner shall acquire and protect no fewer than 3,834 acres of suitable desert tortoise habitat in perpetuity. All terms and measures of Condition of Certification **BIO-3** shall apply to the transaction, management, security deposit and all other actions related to the acquisition and protection of these lands. Selection criteria for desert tortoise compensation lands shall be as listed below. In general, the

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compensation lands shall provide habitat conditions, quality and function that are equal to or better than those present on the habitat to be impacted. The project owner shall submit a formal acquisition proposal to the CPM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for desert tortoise in relation to the criteria listed above and must be approved by the CPM in consultation with BLM, CDFG and USFWS.

Compensation lands shall:

- a. ~~be within the Colorado Desert Recovery Unit, with potential to contribute to wildlife habitat connectivity and build linkages between desert tortoise designated critical habitat, known populations of desert tortoise, and/or other preserve lands;~~
- b. provide habitat for desert tortoise with capacity to regenerate naturally when disturbances are removed;
- c. ~~be near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation;~~
- d. be contiguous and biologically connected to lands currently occupied by desert tortoise, ideally with populations that are stable, recovering, or likely to recover;
- e. ~~not have a history of intensive recreational use or other disturbance that might cause future erosional damage or other habitat damage, and make habitat recovery and restoration infeasible;~~
- f. ~~not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration; and~~
- g. not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat; and
- h. ~~have water and mineral rights included as part of the acquisition, unless the CPM, in consultation with CDFG, BLM and USFWS, agrees in writing to the acceptability of land without these rights.~~

Verification: All terms and measures of Condition of Certification **BIO-3**, including schedule requirements, submittal and acceptance of a formal acquisition proposal, completion of the required transactions, and verification of completion for each term or condition, shall apply to the verification of this condition.

15. **Page 4.2-190-4.2-191, BIO-15:** Applicant has no comments on BIO-15.

16. **Page 4.2-191-4.2-193, BIO-16:** Consistent with Applicant's specific comments, please make the following edits:

BIO-16 The Project owner shall implement the following measures to avoid or minimize project-related construction impacts to golden eagles.

1. Annual Construction Phase Golden Eagle Nesting Survey. Each year throughout the project construction period, the project owner will submit golden eagle nesting survey results for potential golden eagle nesting habitat within ten miles of the solar generator site and gen-tie alignment. Survey methods shall be as described in the

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Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations (Pagel et al. 2010) or more current guidance from the USFWS.

2. **Survey Data:** The report shall provide at least the following data for each historic or potential golden eagle nesting territory within the survey area: territory status (unknown, vacant, occupied, breeding successful, breeding unsuccessful); active and inactive nest locations, photographs, substrates, and elevations; any observed territorial or nesting activity; age class of any golden eagles observed; and chronology and number of eggs or young at any active nest.
3. **Territory Status:** A nesting territory or inventoried habitat shall be considered unoccupied by golden eagles only after completing at least two surveys in a single breeding season (Pagel et al. 2010). The observation periods shall be at least 30 days apart. Specific scheduling of the survey dates shall be based on golden eagle nesting season in the Colorado Desert region of California.
4. **Monitoring and Management Plan:** If an occupied nest (as defined by Pagel et al. 2010) is detected within 10 miles of the project area from which the project could be viewed, including the gen-tie line, the project owner shall prepare and implement a Golden Eagle Monitoring and Management Plan for the duration of the construction phase to ensure that construction activities do not cause disturbance to golden eagles. The monitoring methods shall be consistent with those described by Pagel et al. (2010) or more current guidance from the USFWS. The Plan shall be prepared in consultation with the USFWS. Triggers for adaptive management shall include any evidence of project-related disturbance to nesting golden eagles, including but not limited to: agitation behavior (displacement, avoidance, and defense); increased vigilance behavior at nest sites; changes in foraging and feeding behavior, or nest site abandonment. The plan shall include a description of adaptive management actions, which shall include, but not be limited to, cessation of construction activities that are deemed by the Designated Biologist to be the source of golden eagle disturbance.

Verification: No fewer than 10 days following completion of each annual golden eagle nesting survey, the project owner shall provide a written or verbal report of survey results to the CPM, BLM, CDFG, and USFWS. No later than 30 days following the survey, the project owner shall provide the CPM, BLM, USFWS, and CDFG with a complete survey report.

If an active or occupied golden eagle nest is detected within 10 miles of the project site from which the project could be viewed, then the project owner shall provide the CPM, BLM, CDFG, and USFWS with a draft Golden Eagle Monitoring and Management Plan within 14 days of observing the active nest, and shall implement the draft plan upon the CPM's verbal approval, based on consultation with BLM, CDFG, and USFWS. The project owner shall provide revisions within 30 days of receiving written comments from the CPM, based on consultation with BLM, CDFG, and USFWS. Once final, the plan shall be implemented in each subsequent year of project construction if an active golden eagle nest is located within the survey area. All modifications to the approved plan shall be made only with approval of the CPM in consultation with BLM, CDFG, and USFWS. The project owner shall include all descriptions of all activities related to plan implementation in MCRs and ACRs submitted to the CPM.

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17. **Page 4.2-193-4.2-195, BIO-17:** Consistent with Applicant's specific comments, please make the following edits:

BIO-17 The project owner shall implement the following measures to avoid and offset impacts to burrowing owls:

1. Pre-Construction Surveys. The project biology staff shall conduct pre-construction surveys for burrowing owls within the project site ~~and along all linear facilities~~ in accordance with CDFG guidelines (CDFG 2012c). ~~The surveys shall be no more than 30 days prior to initiation of ground disturbance or site mobilization activities.~~ The survey area shall include the project disturbance area (i.e., all lands disturbed in the construction and operation of the Rio Mesa SEGF Project) and surrounding 500-foot survey buffer where access is legally available. The surveys may be conducted concurrently with desert tortoise clearance surveys if field crews are suitably qualified and survey dates are compatible.
2. Implement Avoidance Measures. If an active burrowing owl burrow is located within 500 feet from the any project work area or disturbance are the following avoidance and minimization measures shall be implemented:
 - a. Designate Non-Disturbance Buffer. Fencing shall be installed at a 250-foot radius from the occupied burrow to create buffer area where no work activities may be conducted. The non-disturbance buffer and fence line may be reduced to 160 feet if all project-related activities that might disturb burrowing owls would be conducted during the non-breeding season (i.e., conducted September 1st through January 31st). Signs shall be posted in English and Spanish at the fence line indicating no entry or disturbance is permitted within the fenced buffer.
 - b. Monitoring: If construction activities would occur within 500 feet of the occupied burrow during the nesting season (February 1 – August 31st) the project biology staff shall monitor to determine if these activities have potential to adversely affect nesting efforts, and shall implement measures to minimize or avoid such disturbance.
3. Prepare and Implement a Burrowing Owl Relocation and Mitigation Plan. The project owner shall prepare and implement a Burrowing Owl Relocation and Mitigation Plan, in addition to the avoidance measures described above. The final Burrowing Owl Relocation and Mitigation Plan shall be approved by the CPM, in consultation with BLM, CDFG, and USFWS and shall:
 - a. ~~Provide a quantitative evaluation of unoccupied suitable burrows available on surrounding lands within 1 mile of the project boundary (e.g., by inventorying burrow numbers in selected representative sample areas);~~
 - b. Ensure that a minimum of two suitable, unoccupied burrows are available off-site for every burrowing owl or pair of burrowing owls to be passively relocated, including a discussion of timing of burrow improvements, specific location of burrow installation, and burrow design; design of the artificial burrows shall be consistent with CDFG guidelines (CDFG 2012c) and shall be approved by the CPM in consultation with CDFG and USFWS;

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- c. If artificial burrows will be constructed, identify and describe suitable burrow replacement sites within one (1) mile of the project site and describe measures to ensure that burrow installation or improvements would not affect sensitive species habitat or any burrowing owls already present in the relocation area; burrow replacement sites shall be in areas of suitable habitat for burrowing owl nesting, and be characterized by minimal human disturbance and access; relative cover of non-native plants within the proposed relocation sites shall not exceed the relative cover of non-native plants in the adjacent habitats;
 - d. Provide detailed methods and guidance for passive relocation of burrowing owls occurring during the non-breeding season within the project disturbance area; occupied burrows may not be disturbed during the nesting season (February 1 to August 31) to avoid take under the MBTA and Fish and Game codes;
 - e. Describe monitoring and management of the replacement burrow site(s), and provide a reporting plan; the objective shall be to manage the sites for the benefit of burrowing owls, with the specific goals of:
 - i. Maintaining the functionality of the burrows for a minimum of two years; and
 - ii. Minimizing weed cover.
4. Acquire Compensatory Mitigation Lands for Burrowing Owls. The project owner shall acquire, in fee or easement, ~~900 acres~~ 19.5 acres of land for each burrowing owl or nesting pair that is displaced by the project of compensatory mitigation lands, ~~based on staff's estimate that three territories are present on the project site and that each territory comprises 300 acres.~~ The number of burrowing owls will be determined by the number of ~~if more than three active~~ burrowing owl burrows that are located on the site during pre-construction surveys, ~~then the project owner shall compensate 300 additional habitat acres for each additional active burrow.~~ If burrowing owls are observed to occupy the compensation lands, then only 9.75 acres per single bird or pair is required.

The project owner shall provide funding for the enhancement and long-term management of these compensation lands, as described in Condition of Certification **BIO-3**. Compensatory mitigation lands for burrowing owl must satisfy the criteria below, and may be nested within habitat compensation lands acquired for desert tortoise or native vegetation (see Condition of Certification **BIO-3**), provided those lands also meet the criteria for burrowing owl mitigation lands.

5. Selection Criteria for Burrowing Owl Mitigation Lands. The terms and conditions of this acquisition or easement shall be as described in **BIO-3** [Compensatory Mitigation], with the addition of the following criteria: 1) the compensation land must provide suitable habitat for burrowing owls (as described in the CDFG guidelines for burrowing owl mitigation [CDFG 2012c or more current guidance], and 2) the compensation land must either support burrowing owls or be within dispersal distance from an active burrowing owl nesting territory (generally approximately 5 miles). The burrowing owl compensation lands may be included

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~~with the desert tortoise or native vegetation mitigation lands only if these two burrowing owl criteria are met.~~

Verification: If pre-construction surveys detect an active burrowing owls burrow within 500 feet of proposed construction activities, the Designated Biologist shall provide to the CPM, BLM, CDFG and USFWS documentation indicating that non-disturbance buffer fencing has been installed at least 10 days prior to the start of any construction-related ground disturbance activities. The project owner shall report monthly to the CPM, CDFG, and USFWS for the duration of construction on the implementation of burrowing owl avoidance and minimization measures. Within 30 days after completion of construction, the project owner shall provide to the CPM, BLM, CDFG, and USFWS a written construction termination report identifying how mitigation measures described in the plan have been completed.

If pre-construction surveys detect an active burrowing owls burrow within the project disturbance area, the project owner shall notify the CPM, CDFG, and USFWS within 10 days of completing the surveys that a relocation of owls is necessary. The project owner shall do all of the following if relocation of one or more burrowing owls is required:

1. Within 30 days of completion of the burrowing owl pre-construction surveys, submit to the CPM, BLM, CDFG, and USFWS a Burrowing Owl Relocation and Mitigation Plan.
2. By January 31st of each year following construction for a period of five years, the Designated Biologist shall provide in the ACR a report to the CPM, BLM, USFWS, and CDFG that describes the results of monitoring and management of the burrowing owl relocation area, if applicable. The annual report shall provide an assessment of the status of the relocation area with respect to burrow function and weed infestation, and shall include recommendations for actions the following year for maintaining the burrows as functional burrowing owl nesting sites and minimizing the occurrence of weeds.

All terms and measures of Condition of Certification BIO-3, including schedule requirements, submittal and acceptance of a formal acquisition proposal, completion of the required transactions, and verification of completion for each term or condition, shall apply to the verification of the portion of this condition requiring habitat compensation.

18. **Page 4.2-95 – 4.2-200, BIO-18:** Detailed management plans for American Badger and Desert Kit Fox are not appropriate as the species are not protected under CESA or ESA, and the project would be engaged in activities regulated under California's mammal hunting regulations. This condition has also been revised to be consistent with Ivanpah SEG5:

DESERT KIT FOX AND AMERICAN BADGER MANAGEMENT ~~PLANS~~ SURVEYS

BIO-18 Concurrent with the desert tortoise and burrowing owl clearance surveys, the Designated Biologist or Biological Monitors shall perform a preconstruction survey for badger and kit fox dens in the project area, including areas within 250 feet of all project facilities. If badger and kit fox dens are found, each den shall be classified as inactive, potentially active, or definitely active. Inactive dens shall be excavated by hand and backfilled to prevent reuse by badgers. Potentially and definitely active dens shall be monitored by the Designated Biologist or Biological Monitor for three consecutive

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nights using a tracking medium (such as diatomaceous earth or fire clay) at the entrance. If no tracks are observed in the tracking medium after 3 nights, the den shall be excavated and backfilled by hand. If tracks are observed, the applicant shall develop and implement a trapping and relocation plan in consultation with the Designated Biologist and CDFG. BLM approval may be required prior to release of badgers on public lands.

The project owner shall prepare and implement a Desert Kit Fox and American Badger Management Plan (plan). The objective of the plan shall be to avoid direct impacts to the desert kit fox and American badger as a result of construction of the power plant and linear facilities, as well as during project operation and decommissioning. The draft plan submitted by the project owner shall provide the basis for the final plan, subject to review and comment by the Bureau of Land Management (BLM) and revision and approval by the Compliance Project Manager (CPM), in consultation with California Department of Fish and Game (CDFG).

Prior to ground disturbance at any work site, the project owner shall survey the area and passively exclude any desert kit foxes or American badgers according to the plan. These surveys may be conducted concurrently with the desert tortoise pre-construction surveys (Condition of Certification **BIO-13**, above).

The final plan shall include, but is not limited to, the following procedures and impact avoidance measures:

1. Describe pre-construction survey and clearance field protocol, to determine the number and locations of single or paired kit foxes or badgers on the project site that would need to be passively relocated and the number and locations of desert kit fox or badger burrows or burrow complexes that would need to be collapsed to prevent re-occupancy by the animals. Qualified biologists shall perform pre-construction surveys for badger and kit fox dens throughout the project area, including areas within 250 feet of all project facilities, utility corridors, and access roads. If dens are detected, each den shall be classified as inactive non-natal, inactive natal, potentially active, definitely active non-natal, or active natal den.
 - a. Inactive non-natal and inactive natal dens. Inactive non-natal and inactive natal dens that would be directly impacted by construction activities shall be excavated by hand and backfilled to prevent reuse by badgers or kit fox.
 - b. Potentially active and definitely active non-natal dens. Potentially and definitely active non-natal dens that would be directly impacted by construction activities shall be monitored by the Biological Monitor for three consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) and/or infrared camera stations at the entrance. If no tracks are observed in the tracking medium or no photos of the target species are captured after three nights, the den shall be excavated and backfilled by hand. If tracks are observed, and especially if high or low ambient temperatures could potentially result in harm to kit fox or badger from burrow exclusion, various passive hazing methods may be used to discourage occupants from continued use. A detailed description of the types and methods of passive hazing to be used must be included in the plan; however, approval must be granted by the CPM, in consultation with CDFG prior to implementation. After verification that the den is unoccupied, it shall

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then be excavated by hand and backfilled to ensure that, no badgers or kit fox are trapped in the den.

- c. ~~Active natal dens.~~ During denning season (American badger – March to August, and desert kit fox – February to June), any active natal dens that are detected in the preconstruction surveys shall have a buffer zone of 300 feet to 500 feet surrounding the den, pending approval from the CPM in consultation with CDFG, and monitoring measures shall be implemented. Discovery of an active natal den that could be impacted by the project shall be reported to the CPM and CDFG within 24 hours of the discovery. A detailed description outlining the types and methods of monitoring must be included in the plan. The den location shall be mapped and submitted along with a report stating the survey results to the CPM and CDFG. The Designated Biologist shall monitor the natal den until he or she determines that the pups have dispersed. No disturbance will be allowed for any animal associated with a natal den and any activities that might disturb denning activities shall be prohibited within the buffer zone. Once the pups have dispersed, various passive hazing methods may be used to discourage den reuse. A detailed description of the types of passive hazing to be used must be included in the plan; however, approval must be granted by the CPM, in consultation with CDFG prior to implementation. After verification that the den is unoccupied, it shall then be excavated by hand and backfilled to ensure that, no badgers or kit fox are trapped in the den.
 - d. ~~Exception for American badger.~~ In the event that passive relocation techniques fail for badgers, the project owner will contact the CPM and CDFG to explore other relocation options.
2. ~~Qualitative discussion of availability of suitable habitat on off-site surrounding lands within 10 miles of the project boundary, and quantitative evaluation of unoccupied desert kit fox burrows available on surrounding lands within 1 mile of the project boundary (e.g., by inventorying burrow numbers in selected representative sample areas);~~
 3. ~~Estimates of the distances kit foxes would need to travel across the project site and across adjacent lands to safely access suitable habitat (including burrows) off-site;~~
 4. ~~Proposed scheduling of the passive relocation effort;~~
 5. ~~Methods to minimize likelihood that the animals will return to the project site;~~
 6. ~~Descriptions of any proposed or potential ground disturbing activities related to kit fox relocation, and locations of those activities (e.g., artificial burrow construction);~~
 7. ~~A monitoring and reporting plan to evaluate success of the relocation efforts and any subsequent re-occupation of the project site; and~~
 8. ~~A plan to subsequently relocate any animals that may return to the site (e.g., by digging beneath fences);~~
 9. ~~Notify the CPM and CDFG if injured, sick, or dead American badger and desert kit fox are found. If an injured, sick, or dead animal is detected on any area associated with the solar project site or associated linear facilities, the CPM and the Ontario CDFG Office shall be notified immediately by phone. Written follow up notification via FAX or electronic communication shall be submitted to the CPM and CDFG~~

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within 24 hours of the incident and shall include the following information as appropriate:

- a. ~~Injured animals.~~ If an American badger or desert kit fox is injured because of any project-related activities, the Designated Biologist or approved Biological Monitor shall immediately notify the CPM and CDFG personnel regarding the capture and transport of the animal to CDFG-approved wildlife rehabilitation and/or veterinarian clinic. Following the phone notification, the CPM and CDFG shall determine the final disposition of the injured animal, if it recovers. A written notification of the incident shall be sent to the CPM and CDFG containing, at a minimum, the date, time, location, and circumstances of the incident.
- b. ~~Sick animals.~~ If an American badger or desert kit fox is found sick and incapacitated on any area associated with the solar project site or associated linear facilities, the Designated Biologist or approved Biological Monitor shall immediately notify the CPM and CDFG personnel for immediate capture and transport of the animal to a CDFG-approved wildlife rehabilitation and/or veterinarian clinic. Following the phone notification, the CPM and CDFG shall determine the final disposition of the sick animal, if it recovers. If the animal dies, a necropsy shall be performed by a CDFG-approved facility to determine the cause of death. The project owner shall pay to have the animal transported and a necropsy performed. A written notification of the incident shall be sent to the CPM and CDFG and contain, at a minimum, the date, time, location, and circumstances of the incident.
- c. ~~Fatalities.~~ If an American badger or desert kit fox is killed because of any project-related activities during construction, operation, and decommissioning, or is found dead on the project site or along associated linear facilities, the Designated Biologist or approved Biological Monitor shall immediately refrigerate the carcass and notify the CPM and CDFG personnel within 24 hours of the discovery to receive further instructions on the handling of the animal. If the animal is suspected of dying of unknown causes, a necropsy shall be performed by a CDFG-approved facility to determine the cause of death. The project owner shall pay to have the animal transported and a necropsy performed.

10. Additional protection measures to be included in the plan and implemented:

- a. ~~All pipes within the project disturbance area must be capped and/or covered every evening or when not in use to prevent desert kit foxes or other animals from accessing the pipes.~~
- b. ~~All water sources shall be covered and secured when not in use to prevent drowning.~~
- c. ~~Project perimeter fencing shall be designed to exclude kit foxes from the solar field site during all project phases (construction, operation, decommissioning). The desert tortoise exclusion fencing shall be secured directly to the security fence to minimize the chance that kit foxes can dig under or climb over the fence. The project owner shall coordinate with CDFG to identify any additional~~

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fence design features to maximize the effectiveness of the fence to exclude kit foxes during each phase of the project.

- d. Incorporate and implement the CDFG Veterinarian's guidance regarding impact avoidance measures including measures to prevent disease spread among desert kit foxes. Measures to reduce traffic impacts to wildlife if the project owner anticipates night time construction. The plan must also include a discussion of what information will be provided to all night time workers, including truck drivers, to educate them about the threats to kit fox, what they need to do to avoid impacts to kit fox, and what to report if they see a live, injured, or dead kit fox.

Verification: Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist. No fewer than 30 days prior to the start of any construction-related ground disturbance activities associated with the new project related facilities, the project owner shall provide the CPM, BLM, and CDFG with a draft American Badger and Desert Kit Fox Mitigation and Monitoring Plan for review and comment.

No fewer than 10 days prior to start of any ground disturbance activities associated with the new project related facilities, the project owner shall provide an electronic copy of the CPM approved final plan to the CPM and CDFG and implement the plan.

The project owner shall submit a report to the CPM and CDFG within 30 days of completion of any badger and kit fox surveys. The report shall describe survey methods, results, impact avoidance and minimization measures implemented, and the results of those measures.

No later than 2 days following a phone notification of an injured, sick, or dead American badger or desert kit fox, the project owner shall provide to the CPM and CDFG, via FAX or electronic communication, a written report from the Designated Biologist describing the incident of sickness, injury, or death of an American badger or desert kit fox, when the incident occurred, and who else was notified.

Beginning with the first month after start of construction and continuing every month until construction is completed, the Designated Biologist shall include a summary of events regarding the American badger and desert kit fox in each MCR.

No later than 45 days after initiation of project operation, the Designated Biologist shall provide the CPM a final American Badger and Desert Kit Fox Mitigation and Monitoring Plan that includes: 1) a discussion of all mitigation measures that were and currently are being implemented; 2) all information about project-related kit fox and badger injuries and/or deaths; 3) all information regarding sick kit fox and badger found within the project site and along related linear facilities; and 4) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future projects on the American badger and desert kit fox.

19. **Page 4.2-200, Condition of Certification BIO-19:** BIO-19 provides Applicant the option to satisfy the compensatory mitigation obligations established in other BIO conditions, in particular BIO-3, by participating in the SB X8 34 "advance mitigation program."

As implemented by the California Department of Fish and Game ("CDFG") in the Interim Mitigation Strategy, SB X8 34 provides two mitigation options: (1) an advance mitigation option

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and (2) an “in-lieu” fee option.⁶ The Fish and Game code describes “advance mitigation” as “mitigation implemented before, and in anticipation of future impacts to natural resources,” and is included in the interim mitigation strategy.⁷ CDFG’s Interim Mitigation Strategy, describes the two mitigation options for eligible renewable projects under SB X8 34, as follows:

SB 34 Mitigation implementation options include:

- i. An “advance mitigation” option in which the CDFG, working with the other REAT Agencies, identifies and purchases mitigation lands that will be used as a land bank. Qualified projects can purchase credits in that land bank to meet all or a portion of their mitigation obligations. This can be implemented through use of the \$10 million dollar revolving fund established in the legislation, with expenditures to be reimbursed from the participating projects’ mitigation fees.
- ii. An “in-lieu” fee option, whereby the CDFG, working with the other REAT Agencies, would use mitigation fees to implement the individual permit specific project mitigation actions to assist the project proponent in completing mitigation obligations. This option would be implemented by the CDFG and the other REAT Agencies, with guidance from the IMS as required in SB 34.⁸

BIO-19 should be clarified to provide certainty that participation in either of the habitat mitigation options under SB X8 34 and administered by CDFG fully mitigate for habitat related impacts to all species, and not just the species cited in certain portions of the PSA. This is consistent with the Fish and Game Code, which states that CDFG, in consultation with the Energy Commission, may purchase land and conservation easements “that can be used to *fully mitigate* the impacts of the take of endangered species, threatened species, or candidate species” for purposes of the California Endangered Species Act and the Power Facility and Site Certification statutes of the Public Resources Code.⁹ Also, eligible mitigation actions under SB X8 34 must “[c]ontribute to the conservation of each candidate species, threatened species, or endangered species for which a permit is issued.”¹⁰

As written, BIO-19 may be read to place an undue risk on Applicant. “If the project owner chooses to satisfy its mitigation obligations through this program, the advance mitigation lands shall meet the criteria as stated in all applicable compensation conditions of certification in the Commission Decision.” However, if Applicant chooses to participate in the CDFG’s SB X8 34 program, the CDFG working with other Renewable Energy Action Team agencies, not Applicant, would identify and purchase the mitigation lands. As stated in the code, “With respect to the Energy Commission, in the case of an applicant seeking certification for a solar thermal or geothermal powerplant pursuant to Chapter 6 (commencing with Section 25500) of Division 15 of the Public Resources Code...*the sole effect of a mitigation action described in subdivision (c),*

⁶ See Implementing Senate Bill X8 34, presentation July 10, 2010 available at http://www.energy.ca.gov/33by2020/documents/2010-07-14_meeting/2010-07-15_Implementing_the_IMS_REPG_Kevin_Hunting_Victorville.pdf; see also CDF&G Interim Mitigation Strategy, September 2010, DRECP-1000-2010-006-F, p. 1-2, available at <http://www.energy.ca.gov/2010publications/DRECP-1000-2010-006/DRECP-1000-2010-006-F.PDF>.

⁷ §2069(c)(2)(iii)

⁸ See CDF&G Interim Mitigation Strategy, September 2010, DRECP-1000-2010-006-F, p. 1-2, available at <http://www.energy.ca.gov/2010publications/DRECP-1000-2010-006/DRECP-1000-2010-006-F.PDF>.

⁹ Fish & Game C. §2069(b).

¹⁰ §2069(c)(2)(A)(i).

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and paid for through the deposit of fees as described in Section 2099, is to relieve an applicant of the obligation to directly take actions that are taken instead by the department or its contractor or designee pursuant to subdivision (b) to meet the applicant's obligations with respect to mitigating the powerplant's impacts to species and habitat.¹¹ BIO-19 should be clarified so that there is no question that lands acquired by CDFG under SB X8 34 satisfy the requirements in the relevant BIO conditions for compensatory mitigation.

For these reasons, Applicant requests that Staff revise BIO-19 as follows:

BIO-19 The project owner may choose to satisfy its compensatory mitigation obligations identified in this section of the Commission Decision by participating in either the California Department of Fish and Game's advance mitigation program option or the "in-lieu fee" program option established under SB X8 34 instead of acquiring compensation lands. If the project owner chooses to satisfy its mitigation obligations through this either of these program options, then the project owner will be considered to have fully mitigated the impacts of the take of any and all endangered species, threatened species and candidate species. Participation in either SB X8 34 program option shall result in the project owner having met ~~the advance mitigation lands shall meet~~ the criteria as stated in all applicable compensation conditions of certification in the Commission Decision. In addition, the project owner shall provide proof of participation in the advance mitigation program to the CPM.

~~If electing to use this provision, the project owner shall provide proof to the CPM that the advance mitigation lands meet the criteria as stated in all applicable compensation conditions of certification in the Commission Decision.~~ If the project owner elects to use this provision prior to posting security required by the conditions of certification, the project owner shall provide proof of participation to the CPM, to be verified by CDFG, prior to any ground disturbance. If the project owner elects to use this provision after posting such security, the project owner shall provide proof of participation ~~in the advance mitigation program~~ prior to the time required for habitat compensation lands to be surrendered in accordance with all applicable compensation conditions of certification in the Decision. No later than 18 months after the start of project ground-disturbing activities, the project owner shall demonstrate completion of the advanced mitigation process or the in-lieu fee option and that its compensatory mitigation obligations have been satisfied.

20. **Page 4.2-200, Condition of Certification BIO-19:** Consistent with Applicant's comments, please make the following edits:

BIO-20 The project owner shall prepare and implement a Project Closure, Revegetation, and Reclamation Plan (plan) and shall provide financial security in accordance with BLM requirements to ensure implementation of the plan for the portions of the project that must be removed from public land, primarily the generator intertie line. The plan shall describe activities and schedule for the closure, removal, reclamation, and revegetation of the portion of project facilities that were installed on public land. ~~of the project site and other facilities including the gen-tie line~~ at the time that the facility is decommissioned, or otherwise ceases to be operational. The plan shall specify site-specific criteria for evaluating and monitoring compliance with the approved

¹¹ §2069(f)(2).

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reclamation plan. The plan will guide site and closure activities, including all methods proposed for revegetation or reclamation of disturbed areas of public land upon closure of the facility. ~~The plan must address all revegetation, reclamation, and other required facility closure activities.~~ In addition to specifying closure, revegetation, and reclamation activities upon planned closure, the plan also shall specify closure, revegetation, and reclamation activities and schedule in the event of unanticipated facility closure prior to the anticipated lifespan of the plant. The plan shall specify estimated cost for implementation and the project owner shall provide a financial security to ensure availability of funds to fully implement the plan. ~~The plan and amount of financial security for the public land portions of the project shall be reviewed and updated on five-year intervals throughout the life of the project.~~ The plan shall applies to publicly managed land and shall include, but not be limited to, the following elements:

1. Plan Purpose: The plan shall explicitly identify the objective of the revegetation plan to be control and minimization of weed invasion or spread, dust, and erosion.
2. Standards/Monitoring: Performance standards for success thresholds, weed cover, performance monitoring methods and schedule, and maintenance monitoring.
3. Baseline Surveys – Methods to perform baseline surveys for planning reclamation or revegetation efforts, with a level sufficient to collect data necessary to prepare the plan.
4. Seed Handling: Methods for seed collection, testing, and application.
5. Soil Preparation: If determined necessary by baseline surveys conducted pursuant to part 3 (above). Soil descriptions, compaction measurements, mulch application, soil storage, seed farming, mycorrhizal inoculation, biological crust collection, or other soil preparations may be included as part of the plan.
6. Weed Management. Discussion of scope, duration, success criteria, and monitoring of weed management activities shall be included in the plan, plan to be consistent with recommended Condition of Certification BIO-7.
7. Financial Security. The Plan shall estimate costs of closure, revegetation, and reclamation for the portions of the project on public land in accordance with Bureau of Land Management requirements and timing, to be based on current rates for personnel, equipment, and materials to implement each component of the plan, accounting for anticipated inflation over the life of the project. The project owner shall specify the source of its cost basis and submit the plan to the BLM for ~~and inflation factors, for staff's review and approval.~~

Verification: ~~The revised draft~~ Project Closure, Revegetation, and Reclamation Plan ~~and proof of financial security~~ shall be submitted to the BLM Authorized Officer (AO) CPM for review and approval no more than six months following initiation of ground-disturbing project activities. Proof of financial security shall be submitted to the AO in accordance with BLM requirements concerning closure, revegetation and reclamation on BLM land. The project owner shall periodically review the plan and financial security for the portions of the project on public (BLM) land in accordance with BLM requirements. every five years thereafter and shall submit proposed plan revisions and verification that the financial security is adequate, based on time, equipment, and materials costs at each five-year review interval to the AO CPM for review and approval. ~~Modifications to the approved Closure,~~

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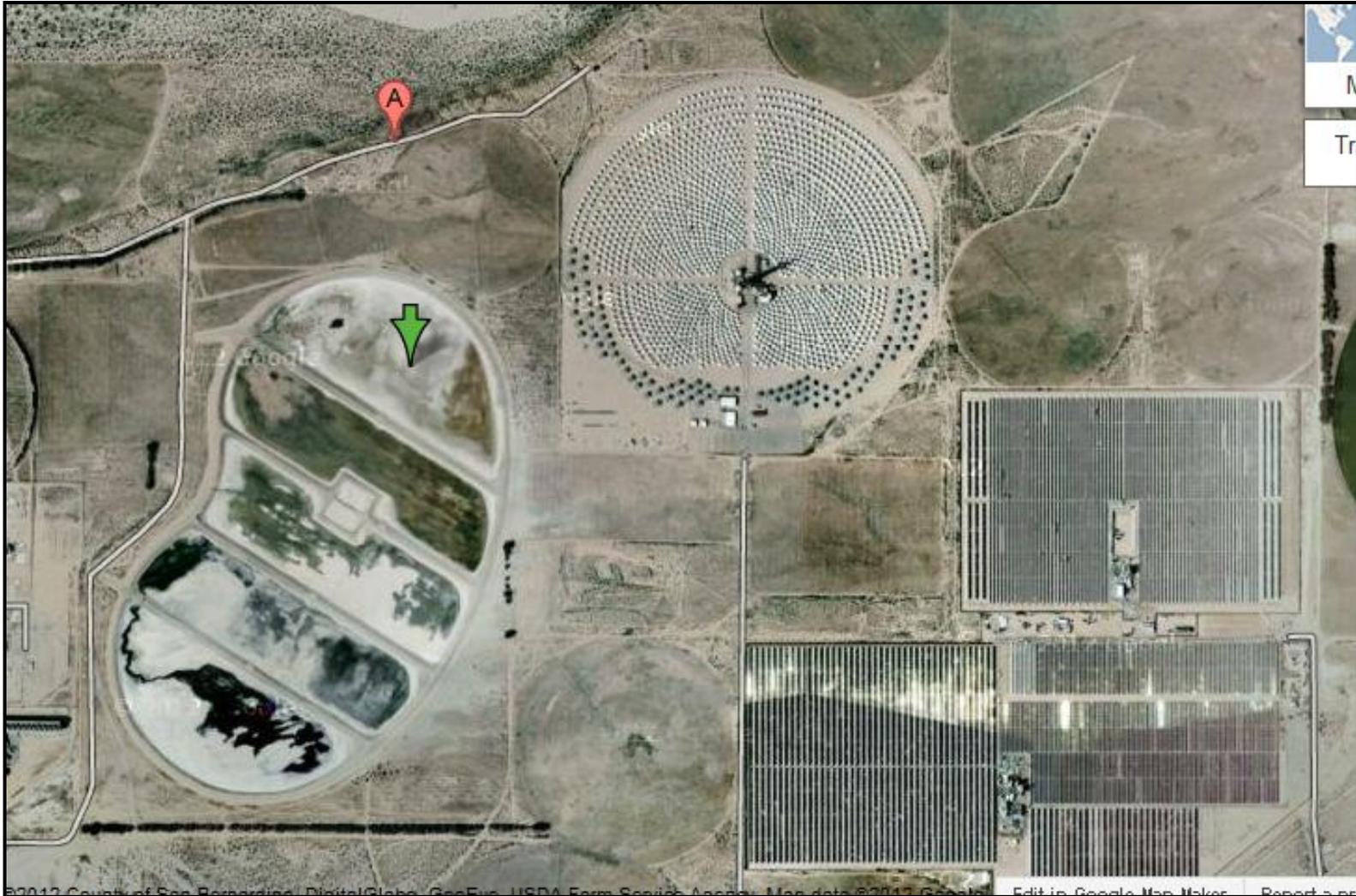
Revegetation, and Reclamation Plan shall be made only through consultation with and authorization of the CPM.

Financial assurance may be in the form acceptable to the BLM AO. ~~of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") only as approved the CPM and CDFG. Prior to submitting the Security verification, the project owner shall obtain the CPM's approval of the form of the Security, in consultation with BLM, CDFG, and USFWS.~~

REFERENCES

BLM. 2002. Northern and Eastern Colorado Desert Coordinated Management Plan and Final Environmental Impact Statement. July 2002.

National Park Service. 2012. The Sonoran Desert. Accessed online:
<http://www.nps.gov/cagr/forkids/the-sonoran-desert.htm>. October 24, 2012.



SOURCE: Google Earth		BIOLOGICAL RESOURCES 1 AERIAL PHOTOGRAPH OF SOLAR ONE FACILITY		
URS	NO SCALE	CREATED BY: NJ	DATE: 11-15-12	FIG. NO: BR-1
		PM: AL	PROJ. NO: 27652105.00513	

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

**Applicant's General Comments and Comments to Conditions of Certification
on the Preliminary Staff Assessment**

CULTURAL RESOURCES

This section provides first the general comments applicable to each resource type, followed by specific comments by page. The Applicant also submits under confidentiality updated tables of prehistoric archeological sites (with threshold discussion per General Comment 1, below), historic archeological sites, multi-component archeological sites, isolates, and undetermined sites with locational information to help work with staff to determine the final number and location of sites in the PAA under each category. The updated tables contain confidential cultural resources location information and has been supplied to the CEC under separate and confidential cover as Confidential Attachment A.

GENERAL COMMENTS

Prehistoric Archeological Sites

1. The threshold set forth by the PSA for potentially ineligible prehistoric archeological sites on page 4.3-87 is not justified. For example, the threshold of five reduction features or fewer is not supported and should be removed from the threshold. Because the definition of a site boundary is based on an arbitrary 30 meter criteria, the number of loci are similarly arbitrary and do not reflect meaningful patterns of pasts prehistoric use. Also, there is no definition of "sparse lithic scatters" and there is no justification for using 40 surface artifacts as a measure for "small reduction features". Note that the California Archeological Resource Identification and Data Acquisition Program (1988) defines sparse lithic scatters (i.e., surface densities less than 3 flake stone items per square meter), and Mark Giambastiani's research results and evaluation from his work related to the Quackenbush Training Area, Marine Corps Air Ground Combat Center (MCAGCC), Twenty-nine Palms, California (2006) indicates that small reduction features include those features with less than 50 surface artifacts. Additionally, the PSA applies the thresholds subjectively and fails to explain how they were applied. For example, it is unclear how the PSA determined which features constituted "dispersed artifact scatters." The majority of the prehistoric archeological sites in the PAA are related to commonly occurring prehistoric lithic reduction scatters, which the PSA refers to as quarries. As correctly noted by the PSA, "many quarries produce redundant information" (p. 4.3-87). Yet, the PSA only recommended that 42 sites were not eligible using this threshold. The Applicant believes this understates the number of ineligible sites. Even using the CEC's threshold, it appears that more sites should be considered ineligible. Refer to Tables A and B in the attached CD located under separate and confidential cover as Confidential Attachment A.
2. The prehistoric archeological site eligibility findings are not explained or supported. Table 12 states that there are 16 prehistoric archeological features that the PSA has determined to be eligible for the CRHR; however, there is no analysis or support for why these sites have been determined eligible. *The applicant disagrees that those sites are eligible, as set forth in the Cultural Resources Assessment Report for the Rio Mesa Electric Generating Facility, Riverside County, California. Confidential submission to Energy Commission Docket Unit on October 14, 2011 (Nixon et al. 2011).* The PSA should incorporate Staff's review of the most recent version

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of the Technical Report. Refer to Table B in the attached CD located under separate and confidential cover as Confidential Attachment A for an analysis for the sites not eligible.

3. The PSA groups the prehistoric archeological sites into subtype categories without rationale to justify these conclusions. The PSA indicates throughout that the “rationale will be provided in the FSA”. The deferred analysis does not enable meaningful comment and responses, and is therefore contrary to CEC guidance (20 CCR 1742.5(c)). The PSA fails to provide a well-articulated theoretical perspective and sound rationale as to how particular sites were grouped into sub-categories/types in their analysis since these definitions are being used as the basis for sites that staff feel require additional testing to make eligibility determinations. In particular, the grouping of various trails and sites into a religious/ceremonial location category is not supported by any specific evidence in the record. The Applicant will undertake further analysis per the workplan for these sites, but it is premature to reach any such categorization conclusions.
4. The Applicant has agreed to conduct geoarchaeological testing, and the CEC has concurred with the Applicant’s Geoarchaeological Research Design. Applicant began this work in November. The document should be corrected throughout to reflect Staff’s approval of the Applicant’s Geoarchaeological Research Design.
5. The PSA fails to adequately justify why additional extensive subsurface testing is required at 107 sites, especially where relevant guidance recognizes that extensive site-wide sampling may be infeasible, may damage resources, and may not be necessary (Nat'l Park Serv., National Register Bulletin No. 36, "Guidelines for Evaluating and Registering Archaeological Properties" (2000)). Indeed, under CEQA and CEC regulations, Staff must limit its requests for information and further analysis to those data sets reasonably necessary to complete the analysis (Pub. Res. Code § 21160, 20 C.C.R. § 1716(b)). The scope of that information should be limited to what is necessary to the analysis and not extend beyond. *Sierra Club v. State Bd. of Forestry* (1994) 7 Cal. 4th 1215, 1231, *see also* 58 Ops.Cal.Atty.Gen. 614 (1975). There is already substantial information on the record upon which to further narrow the list of potential eligible prehistoric archeological sites (Nixon et al. 2011; URS 2012j, 2012k, 2012b, 2012l). The Applicant has been working with CEC staff on an archeological research design and testing plan, but disagrees that 107 sites merit further testing. Note also that the correct total is 107 sites, not 108.
6. Many of the 107 sites represent the same site type, with the same constituents made of the same materials, representing ubiquitous data. Therefore, after applying the revised thresholds recommended in General Comment 1, above, it is possible to group the types and conduct sampling on a subset of the 107 sites. If in the subset analysis a type is found to be eligible, then others of the same type would be assumed eligible as well, without further impacting the eligible resources. The Applicant will continue working with Staff to identify the appropriate subset of site types for further evaluation testing, keeping in mind the objective is to create limited disturbance prior to making an evaluation determination. To that end, please refer to Tables A and B in the attached CD located under separate and confidential cover as Confidential Attachment A that further classifies the sites for testing eligibility and makes recommendation regarding the type of testing at each site.
7. With respect to mitigation for archeological sites, CEQA requires that agencies should, where feasible, avoid archeological sites by preserving in place and that the CEQA document should discuss the options for preservation, and where data recovery is the only option, why it is adequate and beneficial (14 CCR 15126.4(b)(3)). Therefore, the PSA should note that within

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the project site and project linears, contributing components of sites determined eligible will be avoided to the extent feasible and consistent with good engineering practice and project generation objectives. Avoidance of sacred sites, if any, will be determined in coordination with California Native American tribes (CEC Rules, Ch. 6, Article 2, Section 2324(c) and 2325). Other methods of preservation - incorporation of sites within open space, granting of a conservation easement or covering with a layer of chemically stable soil - are infeasible. This is due to the nature of the development, which requires construction on the full site to meet power generation needs - 500 MW - as required by the power purchase agreements for the project. For those locations for which preservation in place is not feasible, the Applicant proposes preparation of a site testing plan and data recovery. Generally, data recovery will be adequate and most beneficial because it will make the data available to the public and further the understanding and research regarding past uses of the site.

Landscapes/Districts Generally

8. It should be clarified that all the landscapes/districts discussed in the PSA are proposed only, as none have been formally nominated to the CRHR. Therefore, the Applicant recommends a global change to include the word "proposed" in conjunction with references to landscapes/districts. In addition, change all mention of staff assuming or concluding such a resource to be eligible to CEC staff recommending a resource to be eligible for later review and determination of eligibility.
9. Additionally, the PSA bases its analysis of the landscapes/districts on previous Commission decisions where the staff "assumed" various landscapes/districts to be eligible for the CRHR. However, an agency is not permitted under CEQA to assume that a resource is a significant historical resource without substantial evidence (CEQA explicitly provides that determinations must be supported by substantial evidence per 14 CCR 15064.5). The PSA does not provide such substantial evidence as discussed in the Specific Comment with respect to each of the proposed landscapes/districts below.
10. The PSA applies CEQA and looks to determine whether any resources are eligible for listing in the CRHR. Only California Resources are eligible for the CRHR. For example, only California properties listed in, or formerly determined eligible for listing in, the NRHP are automatically listed on the CRHR (Pub. Res. Code 5024.1(a); 14 CCR 4851). However, the geographic scope of the proposed landscapes considered in the PSA are massive, most of which cover at least portions of two states, and one that covers four western states. Thus, while the PSA may discuss multi-state resources, it has no jurisdiction by which to impose CRHR eligibility or impose mitigation for out of state resources. Regardless, those resources are more properly analyzed through the NEPA process through BLM, and they will be subject to the Section 106 National Historic Preservation Act ("NHPA") process.
11. In analyzing the different kinds of landscapes (archeological, historic, ethnographic), the PSA does not reference or follow appropriate state and federal guidance. Ethnographic landscapes and resources are not defined in state law or regulations and, as discussed in the General Comment 10 above, the PSA does not point to the state guidance that allows such vast, multi-state resources to be found eligible for the CRHR. Specifically, although the state regulations acknowledge cultural landscapes as a construct, there are no provisions by which to find such vast areas eligible. Rather, such areas or places are like districts, which do have specific criteria. Specifically, such districts must 1) "contain a concentration of historic buildings, structures, objects, or sites united historically, culturally, or architecturally," 2) be "defined by precise geographic boundaries" and 3) designate "all individual resources located within the

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boundaries of an historic district ... as either contributing or as noncontributing to the significance of the historic district” (14 CCR 4852(a)(5); 14 CCR 15064.5). There are also specific federal guidelines that apply for resources that may be considered for listing under the NRHP. For example, ethnographic landscapes may be considered as Traditional Cultural Properties, in accordance with federal guidance. Alternatively, landscapes may be considered as archeological districts in accordance with federal guidance. However, the PSA fails to appropriately apply the most relevant guidelines. For example, the PSA refers to the National Park Services (NPS) Bulletin 38 *Guidelines for Evaluating and Documenting Traditional Cultural Properties* for its analysis of the proposed archaeological districts/landscapes. Archaeological properties also must be evaluated for NRHP eligibility under NPS Bulletin 36 *Guidelines for Evaluating and Registering Archaeological Properties*, which is not cited in the PSA. Regardless, neither guidance document is applied correctly, since both these federal guidelines require boundaries. NPS Bulletin #36 requires justified, defensible boundaries for archeological districts and NPS Bulletin #38 requires that boundaries for traditional cultural properties be defined narrowly. Bulletin #38 specifically notes that boundaries should not encompass all of the "extensive views of the natural landscape" even though those views may be important to the traditional cultural user and may be considered cumulatively. Throughout the PSA, the analysis does not consider state regulations for districts and selectively, inconsistently, and inaccurately applies Federal guidelines, with the result that the conclusions are not supported by regulatory guidance, adequate justification, or substantial evidence.

Prehistoric Archeological Landscapes/Districts

12. The eligibility analysis of the proposed Prehistoric Trails Network Cultural Landscape (PTNCL) is flawed, as it fails to consistently apply the state regulations and federal guidance, all of which require a justified, defensible boundary. The PSA describes the proposed landscape as following along the length of the historically known route of the Halchidhoma Trail, from where it begins near Blythe at the Colorado River, continuing to the west through the Chuckwalla Valley toward modern San Bernardino, with a width of 10 m. This is an arbitrary boundary delineation. This trail network supposedly went all the way to the Pacific Ocean and its full extent has not been mapped. Without a defined boundary, it is not possible to evaluate integrity of a district or landscape. Further, it does not appear that the project site is within the boundary of the proposed landscape as described in the PSA.
13. If the proposed PTNCL boundary were to be accepted, the extent of this proposed landscape is enormous and the landscape overall is subject to severe disturbance with cities, highways and other infrastructure and development along the route, and therefore, the finding of integrity is not supported by the facts. In addition, the PSA fails to set forth all of the contributing and noncontributing elements as required by state regulations (14 CCR 4852(a)). Finally, the period of significance for the proposed PTNCL is broad and not substantiated.
14. The PSA does not offer substantial evidence to support the statements that the proposed PTNCL is eligible under Criteria 1 or 4, or that the Halchidhoma trail extends on the project site. With respect to Criteria 1, the PSA does not identify any specific events associated with the use of this trade, transportation and/or ceremonial route that have made a significant contribution to the broad patterns of California's history and cultural heritage, a key requirement for eligibility under Criteria 1. Rather, the PSA broadly states that because the trail is referred to in oral histories or creation stories, the landscape is eligible under Criteria 1 (see p. 4.3-90). There is in fact no substantial evidence that the Halchidhoma trail, even if mentioned in oral histories or creation stories, crosses the project site and there is nothing to

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tie the trails on the project site to oral histories or creation stories. With respect to Criteria 4, the PSA indicates that the archaeological sites within the proposed PTNCL may be likely to yield information important in prehistory (Laylander and Schaefer 2011a); however, no important scientific research questions are presented in the PSA related to the PTNCL. Furthermore, no evidence is presented in the PSA that the resources on the project site are related to the Halchidhoma trail or would contribute to the PTNCL by presenting any related unique archaeological resource. "Unique archeological resources" are defined in CEQA at Section 21083.2 (g) of the Public Resources Code as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria: (1) Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information; (2) Has a special and particular quality such as being the oldest of its type or the best available example of its type; or (3) Is directly associated with a scientifically recognized important prehistoric or historic event or person. Conversely, a "nonunique archaeological resource" means an archaeological artifact, object, or site which does not meet the above criteria. A nonunique archaeological resource need be given no further consideration, other than simple recording of its existence by the lead agency if it so elects.

15. With respect to the proposed Prehistoric Quarries Archeological District (PQAD), the PSA identifies this as a contributor to the proposed PTNCL. While a boundary is more defined, the boundary is not justified as it encompasses many "discontiguous" areas that are not all identified. This makes it impossible to judge whether the chosen boundary or constituent contributing resources complies with state guidelines requiring a precise boundary, or Federal guidelines that direct that the boundaries should "encompass, but not exceed, the full extent of the significant resources and land area making up the property." National Register Bulletin #36. In addition, the PSA fails to set forth all of the contributing and noncontributing elements as required by state regulations (14 CCR 4852(a)).
16. The PQAD integrity analysis is unsubstantiated, as the landforms within the project site have been eroded due to natural processes over time and destroyed due to numerous transmission and gas lines, agricultural development, DTC activities, rock hounding, and other recreational activities. The PSA states that the period of significance is the "entire prehistoric and early prehistoric periods" and concludes that the district maintains integrity such that it conveys the significance of that period. In fact, however, the geoarchaeological assessment identified considerable erosional processes at play and that much of the landform that was once at higher elevations has eroded and become displaced across the alluvial fan/flat. There are approximately 2-3 areas of the relict Colorado River Terrace where the landform and lithic scatters are intact as it pertains to location. However, the entire region is and has been a popular location for rock collectors (rock hounds), who come to the area recreationally in search of certain rocks and minerals. The Palo Verde Mesa within the Project area is found in published rock collector's books. In addition, as noted above, transmission and gas lines have been developed in the area and DTC and recreational OHV activities have impacted the site and the vicinity. All of these actions have greatly impacted the integrity of location, and association has been compromised in the majority of these proposed PQAD contributing sites within the PAA.
17. The PSA does not offer substantial evidence to support the statements that the proposed PQAD is eligible under Criteria 4, as suggested in the PSA. With respect to Criteria 4, the PSA indicates that the archaeological sites within the proposed PTNCL may be likely to yield

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information important in prehistory (Laylander and Schaefer 2011a); however, no important scientific research questions are presented in the PSA related to the PQAD. Furthermore, no evidence is presented in the PSA that the resources on the project site would contribute to the PQAD by presenting any related unique archaeological resource for the same reasons discussed in General Comment 15 above.

18. The conclusion regarding how many and which prehistoric archeological sites in the PAA may be contributors to the proposed PTCNL and/or the proposed PQAD is inconsistent and confusing (e.g., page 4.3-86 says 41 may contribute to the proposed PTCNL, 104 may contribute to the proposed PQAD and 14, may contribute to both - a total of 155 sites; then page 4.3-87, says all 166 sites are potential contributors; lastly Table A-4 lists 266 sites, not 166). Further, the conclusions regarding why these sites may be considered contributors are not based on substantial evidence and/or the rationale is being withheld until the FSA is published. In particular, it is not explained how the archeological sites on the Project site could be contributing when the Project site is not even within the boundary. Federal guidance clearly states that districts may not be defined by projects, so any effort to expand the PTNCL based on a project-by-project approach is not appropriate (United States Department of the Interior, 1983; United States Department of the Interior, 1991).
19. The PSA concludes that 25 prehistoric archeological resources require additional subsurface testing to determine whether they contribute to the proposed PTNCL, 103 sites require additional subsurface testing to determine whether they contribute to the proposed PQAD and 14 multi-component sites require further testing to determine if they contribute to both, but does not provide its rationale for why these sites require additional testing, deferring its explanation to the FSA. The Applicant disagrees that any are contributing to the proposed districts and objects to this requirement for the reasons discussed above. Further, if there is no rationale, then the analysis is fundamentally flawed and fails to allow for meaningful comment as required by CEC regulation (20 CCR 1742.5(c)).
20. In addition to failing to articulate a rationale with substantial evidence as to why the various sites in the PAA are actually, or could be, contributing elements to the proposed prehistoric archeological landscapes, the PSA fundamentally misapplies the impact analysis for impacts to landscapes/districts by assuming that impact to every contributing element is a significant impact to a landscape/district. Under the CEQA Guidelines, a significant impact is one that *physically* destroys or alters the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired. The significance of the resource is materially impaired when a project "[d]emolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify [the lead agency's determination of significance]." CEQA Guidelines § 15064.5(b). Loss of a contributing element that is not itself individually eligible in and of itself is not a significant impact.

Historic Archeological Landscapes/Districts

21. With respect to the proposed Desert Training Center Cultural Landscape (DTCCCL)/District, it is not clear if the PSA considers that there is a separate landscape from the BLM proposed district– the Desert Training Center/California-Arizona Maneuver (DTC/C-AMA) District. Regardless, the PSA does not provide substantial evidence to support the argument that the DTC Maneuver Sites warrant further subsurface testing as an element of the proposed mitigation. The PSA text divides the 32 sites into three categories - (a) berms/foxholes, (b)

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tank/tire tracks, and (3) UXO sites, then states that UXO sites have the greatest potential for buried deposit, but it does not limit the subsurface screening/testing to that category. Further, like the DTC Food Related Sites, the DTC Maneuver sites have been documented sufficiently to capture their contribution to the proposed landscape and its historical significance without further subsurface investigation. The rationale that additional testing is necessary to determine CRHR significance is unfounded. It is known that soldiers trained in this area of the desert in 1942-1944, and it is also well documented that they practiced various maneuvers to prepare for WWII deployment. There is the General Patton's Museum in Desert Center, CA dedicated to this activity, countless documents available to the public, and the world-wide-web offers prolific historic information available to researchers, students, and the public to learn about this period of US history and the artifacts and sites associated. Therefore these resources are not individually eligible under any criterion and there is not linkage or additional data potential as a group. The information provided in the PSA indicates that the type of materials that may be below ground would not provide additional information. Regardless, **CUL-5** requires a CRMMP, which will document any unexpected discovery.

22. The PSA concludes without evidence that direct and cumulative impacts to the proposed DTCC and the 32 Maneuver sites are significant (see p. 4.3-109). However, this is a flawed analysis. As noted above, impacting contributing elements in and of itself is not a significant impact to the district. Because berms/foxholes, tank tracks and UXO locations are ubiquitous throughout formerly used DTC locations, documentation of the sites is sufficient; there is no unmitigated project-level or cumulative impact.

Ethnographic Landscapes

23. Ethnographic Research Design (p. 4.3-49-4.3-51) presented in the PSA is inadequate and has not been made available to the Applicant or otherwise peer reviewed. At minimum, the research design should include a summary of data gaps, research questions and testable hypotheses, with methods of collecting and analyzing the data, none of which is found within the Ethnographic Research Design presented in the PSA. Regardless, the PSA finds the presence of three proposed ethnographic landscapes (two near the PAA and one within the PAA). The conclusions provided in the PSA are unsupported and do not appear to be based on objective research, since the PSA says staff will provide the justification later. This is not a valid approach.
24. Even if the design were adequate, the proposed Salt Song Trail Landscape and the proposed Keruk Trail Landscapes are unbounded (for both, the PSA states "A precise delineation and boundary justification... is not necessary..." p. 4.3-121) and therefore, are not eligible for the CRHR based on application of the state regulations and Federal guidance, as discussed above. The PSA fails to provide a substantiated accounting of the individual contributing resources. The analysis provides a table of the contributing elements to the landscape (see pp. 4.3-119-4.3-120), but these elements are vague and all encompassing - water, plants, etc. These "elements" are actually generic environmental resources, and such generic classes do not satisfy the state regulations requiring identification of all *individual* contributing resources (14 CCR 1452(a)(5)). The PSA also fails to identify if the project site contains any such specific contributing elements, and once again, the PSA defers its analysis to a future report to be provided. This prevents the Applicant from responding and fails to allow for meaningful comment.

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25. Additionally, the analysis of the integrity of the proposed Salt Song Trail Landscape and the proposed Keruk Trail Landscapes is not substantiated. The PSA arbitrarily looks only at the segment of the trail in the project vicinity and concludes that impacts to the viewshed in this area would be significant. However, notwithstanding the fact that the PSA arbitrarily segments the trail, the viewshed in this segment also incorporates the view of major towns like Blythe, highways and transmission lines, which undermines the findings of integrity. Thus, the PSA fails to truly and adequately consider the integrity of the landscape as a whole.
26. There is no background or rationale to explain the eligibility recommendations for either the Salt Song Trail Landscape or the Keruk Trail Landscape. For both, the PSA states that the landscapes are eligible for the same general reasons. For the Salt Song Trail Landscape, the PSA proposed that it be eligible under Criteria 1 at the regional level for "its broad contributions to the unique historic events that shaped the Southern Paiute understanding of the landscape....." and the for the Keruk Trail Landscape for "its broad contribution to the unique historic events that shaped the Yuman understanding of the landscape....". However, the PSA does not explain what these "unique historic events" are, where they occurred and why they are significant.

Further, the PSA does not adequately justify its rationale for eligibility of either landscape under Criteria 3. A resource may be eligible under Criteria 3 if it embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic value. Although the song or a dreaming activity may have high artistic value, the landscape itself is not the art, the songs are the art. Additionally, the landscape integrity has been changed over time drastically; for example, the Colorado River has dams that prevent its shifting course and effect on other tributaries, which would likely have been an important component to songs. Many of trails in the songs now have highways (I-10, Runnalls Road) or railroads in their place, which has changed the landscape associated directly with the course in which these songs derived. The growth and development of the region over time with agriculture, canals, damming the river, highways, airports, railroads, transmission and other utilities, residential development, also have dramatically altered the landscape. Therefore the landscape itself cannot be considered eligible as conveying integral artistic value because this landscape has changed radically over time and lacks any integrity of its original form in which these songs are derived. These songs/dreamscapes are an important oral account of the landscape, but the songs and dreamscapes admittedly change over time; the landscape is not the art work, it is the songs/practices themselves that are the art, therefore these proposed landscapes are not eligible under Criteria 3.

27. As for impacts, metaphysical impacts to songs that do "not follow linear trails, but fill/make space" are not secondary impacts addressed under CEQA, which is exclusively focused on impacts to the physical environment (Pub. Res. Code 21002.1; 21060.5). The PSA argues that significant environmental justice impacts stem from the impacts to deceased souls and traditional practitioners and relatives of the deceased who fear the deceased souls may not find their way on the spiritual trail is unavailing. However, CEQA does not protect against generalized fear or religious beliefs. Further, the PSA's efforts to tie the Salt Song to the project site specifically are unconvincing, as the PSA concedes that the RMS site, including the Palo Verde Mesa is not mentioned in the song. Further, although there are statements that the Salt Song trail also has a physical trail element that continues to be used today, there is no evidence of any such trail on the project site, which is privately owned.

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28. If the vast Salt Song Trail and Keruk Trail Landscapes are in fact eligible under the NRHP (which will be determined by BLM in consultation with SHPO), the project's effects would be indirect and visual, as neither of these trails is on the project site and the PSA does not present substantial evidence to support the conclusion that the effects of the project would be significant and unavoidable. To the contrary, traditional practitioners have stated that no amount of landscape alteration can prevent them from continuing the tradition (p. 4.3-123). The PSA fails to show how the physical characteristics of the trails (Salt Song and Keruk trails) will be materially altered by additional viewshed interruptions when there are significant viewshed interruptions all along the trails, including major cities, industrial uses, roads and infrastructure.
29. With respect to the Palo Verde Mesa Landscape, based on the definition staff provided, an ethnographic landscape "is defined generally as a landscape containing a variety of natural and cultural resources that associated people define as heritage resources." Staff's evidence and rationale for the Palo Verde Mesa Ethnographic Landscape does not meet the very basic definition and provides only firsthand rationale based on the authors subjective opinion regarding this landscapes significance. Further, the PSA points to nothing on site that relates to tribal New World Agriculture or occupation from 1829 to 1905, which is the defined period of significance. For this reason all references to the Palo Verde Mesa Ethnographic Landscape should be stricken.
30. Further, the conclusions of the integrity analysis do not match the descriptions of the revisions to the landscape and are not supported by substantial evidence. Based on the actual facts on the ground, none of the four constituent zones - the river, floodplain, mesa and mountains - have integrity. Specifically, based on the PSA's own description, the river was revised significantly in the twentieth century with dams and levees, the floodplain has been put into modern agricultural use in over 90 percent of the lands, erasing prior New World agricultural patterns, the mesa was scarred with World War II training exercises that were ubiquitous throughout, as well as mining and recreational vehicle use, together serving to erase and blur evidence of the past. The mountains have been cut through with roads and flanked by mining activities, similarly obscuring the past.
31. Additionally, the PSA describes the project site as potentially providing contributing elements to the proposed Palo Verde Mesa Landscape in terms of providing information regarding winter occupation of the mesa and camp relationships to lithic tool reduction. However, the project site provides ubiquitous examples of lithic tool reduction, which is all prehistoric (none dates from the period between 1829-1905), and there is no substantial evidence presented that the project site provides examples of winter mesa occupation between 1829-1905. Further, the contributing elements to this proposed landscape provided in Table 18 on page 4.3-120 do not list lithic tool reduction sites as relevant or winter camps. Even if the landscape were found to have justified boundaries, the project site does not provide contributing elements of a significant nature that can be documented as occurring during the period of significance. Additionally, the identity of any contributing resource is only vaguely and generically identified, and no substantial evidence that specific contributing resources would be altered. As a result, no additional mitigation should be required for this proposed landscape.
32. The PSA analysis of the RMS project's contribution to cumulative impacts to the proposed ethnographic trail landscapes indicates that the Staff will "segment" the landscapes to

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conduct a cumulative analysis in the future, but there is no legal basis cited upon which such segmentation would be permitted, and any such exercise would be arbitrary.

Historic Resources

33. The PSA is not clear on which historic period resources Staff has determined to be ineligible/eligible. The Applicant concurs that the two 161kv lines are eligible, but disagrees that the Bradshaw Trail in the project vicinity, the Bradshaw Trail Borrow Pit, or Palo Verde Irrigation District (PVID) are eligible.
34. With respect to the Bradshaw Trail, the PSA relies on a prior finding that the Bradshaw Trail is NRHP-eligible to determine that the segment in the PAA is also eligible. However, that prior finding was based on an analysis of a different project and was not specific to the portion of the Bradshaw Trail located on site. The segment of the road/trail in the project area is approximately five and one-half miles. The original Bradshaw Trail extended a length of approximately 101 miles from La Paz, Arizona to San Bernardino County, California. Substantial evidence supports a finding that the portion of the Bradshaw Trail that crosses the project is not eligible because it has lost its integrity due to (a) evidence that the trail in this location is not the original alignment, (b) there are no cultural materials presently associated with the trail in this section, instead non historic features line the road/trail – canals and transmission lines, and (c) no evidence of the original trail remains - rather the “trail” is now a two-way improved, regularly graded dirt road since 1948 (Adam Rush, Principal Planner, Riverside County, 11/14/2012), and in this vicinity has already been paved. Therefore, the portion of the Bradshaw Trail on the Project site no longer reflects an integrity of setting, feeling, association, or design.
35. The PSA states that it is unable to evaluate the significance of any impact to the Bradshaw Trail because the project description is not settled. BLM has final decision making authority as to the improvements to Bradshaw Trail. Regardless, as noted above in General Comment 34, there is no impact, as the trail is not an eligible resource.
36. With respect to the Bradshaw Trail Burrow Pit, the PSA presents no substantial evidence that the pit is CRHR-eligible (all the evidence cited points to the Bradshaw Trail Burrow Pit being a modern resource and ineligible), but yet the PSA defers the determination to the FSA. Again, this deferral of analysis is not justified.
37. With respect to the Palo Verde Irrigation District (PVID), the PSA identifies it as a potential eligible CRHR district under Criteria 1, but defers actual analysis to the FSA. This deferral is not justified. The evidence presented by the Applicant, which found that the district elements have been heavily modified over time such that it no longer retains integrity is not contradicted by the fact that other irrigation districts have been determined eligible in the past where modern materials were used. Specifically, the PSA points to the Reclamation District 10000 (RD 10000) (NRHP eligible) and Turlock Irrigation District (TID) (CRHR eligible) as evidence for why the PVID may be eligible. However, these examples are not directly analogous. RD 10000 represents the first, and one of the largest, reclamation districts in California and TID represents the oldest irrigation district in California. The proposed PVID district is a common example of many such districts that enabled agriculture in otherwise arid areas along the Colorado River. Additionally, RD 10000 and TID were both found significant based on their original period of significance (early 1900s for RD 10000 and late 1800s for TID) and retained their integrity from that period. Here, unlike those districts, as noted in the PSA, a devastating flood in 1905 destroyed much of the original PVID system, and another flood in

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1922 again devastated the new system. There is no justification for integrity based on the potential original period of significance from 1877. Further since the time the district was incorporated many changes have occurred including construction of a dam and over 30 miles of levees. In addition, PVID has aggressively modernized its facilities such that the proposed district does not retain integrity of workmanship, design, materials, and feeling.

The PSA finds the period of significance for the PVID potential district extends to the present, but as noted in the PSA (p. 4.3-1), resources less than 50 years old must be exceptional and the PSA offers no support for why the PVID is an exceptional resource. To the contrary, there are multiple irrigation districts (California Development Company, Imperial Irrigation District, and Metropolitan Water District) with historical water grants from the early 1900s on the Colorado River and according to guidance, properties generally must be viewed comparatively. *National Register Bulletin How to Apply the National Register of Criteria for Evaluation*, which is the professional standard for methods used for evaluating properties, states that the property must be subjected to a comparative evaluation (National Park Service 1998). The only time it is not necessary to evaluate the property in question against other properties is when:

- It is the sole example of a property type that is important in illustrating the historic context or
- It clearly possesses the defined characteristics required to be strongly representative of the context.

These conditions are not met here. Therefore, PVID must be examined in relation to other facilities. Whereas RD 10000 represents one of the first, and one of the largest, reclamation districts in California, and TID is the first irrigation district in the state, the PVID does not share these characteristics. The proposed PVID district is a common example of many such districts, such as the Imperial Irrigation District and TID, which enabled agriculture in otherwise arid areas. Nor is the PVID dam unique. The Bureau of Indian Affairs has the Headgate Rock Dam for the Colorado Indian Tribes, and Imperial Irrigation District operates the Senator Walsh Dam, the Imperial Diversion Dam, and the Laguna Dam. PVID should not be determined eligible and no mitigation should be required.

38. With respect to impacts, note that for the portion of the Bradshaw Trail road that crosses PVID drains (Palo Verde Drain, Estes Drain, and Private Drain No. 1), the project will simply pave the existing road crossings by using a Bailey's Bridge type structure to avoid impacts to the drain. Therefore, there will be no impact to the drains themselves. With respect to the 34th Avenue crossings (Hodges Drain, and C-03 Canal), the project will construct new 24 foot wide crossings adjacent to the existing county crossings and spanning the features without touching them. However, this construction would not impact the integrity of the drains, as they are not contributing and are already significantly altered. The Hodges Drain was not part of the original construction and was a late and modest addition to the irrigation district. The drain lacks any distinguishing features, materials, and arrangements and has likely been altered to accommodate the ongoing maintenance and grading of Bradshaw Trail Road and 34th Avenue through time. The C-03 Canal has been significantly altered with non-historic period additions (bulkhead gates and drain, non-historic period metal panels, pressure treated timber, and poured concrete reinforcement). At the intersection of the C-03 Canal and Bradshaw Trail Road (on the west side of SR-78), the canal is a partially concrete-lined basin

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approximately 20 feet wide with vegetation and rocks situated along both banks. At the intersection of the C-03 canal and 34th Avenue, the canal is a concrete-lined basin approximately 10 feet wide with two dirt access roads situated along both banks. Since its construction, the canal has been heavily altered, including accommodating the ongoing maintenance and grading of Bradshaw Trail Road and 34th Avenue through time. One additional crossing to each of these facilities would not impact the integrity of either the individual drains or the proposed potential district as a whole.

FINDINGS OF FACT

There are no Findings of Fact in this section of the PSA

CONDITIONS OF CERTIFICATION

1. **CUL-1 Proposed Prehistoric Trails Network Cultural Landscape (PTNCL) Documentation and Possible NRHP Nomination Program**

Page 4.3-178: The Prehistoric Trails Network Cultural Landscape is a “proposed” landscape and, as recommended in the General Comments above, the word “proposed” should be inserted in all references to this landscape. The PSA does not contain substantial evidence to support an eligibility finding using state or federal guidance. Therefore, there is no legal nexus for requiring mitigation. However, the Applicant is willing to pay the fee.

2. **CUL-2 Proposed Desert Training Center Cultural Landscape (DTCCCL) Documentation and Possible NRHP Nomination Program**

Page 4.3-179: The Desert Training Center Cultural Landscape is a “proposed” landscape and, as recommended in the General Comments above, the word “proposed” should be inserted in all references to this landscape. The PSA does not contain substantial evidence to support an eligibility finding using state or federal guidance. Therefore, there is no legal nexus for requiring mitigation. However, the Applicant is willing to pay the fee.

3. **CUL-3 Cultural Resources Personnel**

Page 4.3-182, 1st and 2nd paragraph under Required Cultural Resources Technical Specialists: The CRS may qualify as the PPA and/or PHA. A clarification to the condition has been added in two places below to reflect this.

CUL-3 Cultural Resources Personnel

Prior to the start of construction-related ground disturbance or grading, boring, and trenching, as defined in the General Conditions for this project; surface grading or subsurface soil work during pre-construction activities or site mobilization; or mowing activities and heavy equipment use in loose or sandy soils, at the site and for access roads and linear facilities, the project owner shall obtain the services of a Cultural Resources Specialist (CRS) and one or more Alternate CRS(s). The project owner shall submit the

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resumes and qualifications for the CRS, CRS alternates, and all technical specialists to the CPM for review and approval.

The project owner shall ensure that the CRS manages all cultural resources monitoring, mitigation, curation, and reporting activities, and any pre-construction cultural resources activities (e.g., geoarchaeology or data recovery), unless management of these is otherwise provided for in accordance with the cultural resources conditions of certification (Conditions). The CRS may elect to obtain the services of Cultural Resources Monitors (CRMs) and other technical specialists, if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall obtain the services of a Native American Monitors (NAMs), as required by **CUL-12**. The project owner shall ensure that the CRS makes recommendations regarding the eligibility for listing in the California Register of Historical Resources (CRHR) of any cultural resources that are newly discovered or that may be affected in an unanticipated manner.

No construction-related ground disturbance or grading, boring, and trenching, as defined in the General Conditions for this project; surface grading or subsurface soil work during pre-construction activities or site mobilization; or mowing activities and heavy equipment use in loose or sandy soils, at the site, access roads, and linear facilities, shall occur prior to CPM approval of the CRS and alternates, unless such activities are specifically approved by the CPM.

Approval of a CRS may be denied or revoked for reasons including but not limited to non-compliance on this or other Energy Commission projects and for concurrent service as CRS on an unmanageable number of Energy Commission projects, as determined by the CPM. After all ground disturbance is completed and the CRS has fulfilled all responsibilities specified in these cultural resources conditions, the project owner may discharge the CRS, if the CPM approves.

If, during operation of the proposed power plant, circumstances develop that would require ground disturbance in soils or sediments previously undisturbed during project construction, no surface grading or subsurface soil work shall occur prior to submission of a Petition to Modify and CPM review and approval of a project-specific protocol for addressing unanticipated discoveries, consistent with the approved Cultural Resources Mitigation and Monitoring Plan (CRMMP).

CULTURAL RESOURCES SPECIALIST

The resumes for the CRS and alternate(s) shall include information demonstrating to the satisfaction of the CPM that their training and backgrounds conform to the U.S. Secretary of the Interior's Professional Qualifications Standards, as published in Title 36, Code of Federal Regulations, part 61 (36 C.F.R., part 61). In addition, the CRS and alternate(s) shall have the following qualifications:

- Listing in the Register of Professional Archaeologists;
- Qualifications appropriate to the needs of the project, including a background in anthropology, archaeology, history, architectural history, or a related field;

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- At least three years of archaeological or historical, as appropriate (per nature of predominant cultural resources on the project site), resources mitigation and field experience in California; and
- At least one year of experience in a decision-making capacity on cultural resources projects in California and the appropriate training and experience to knowledgeably make recommendations regarding the significance of cultural resources.

The resumes of the CRS and alternate CRS shall include the names and telephone numbers of contacts familiar with the work of the CRS/alternate CRS on referenced projects and demonstrate to the satisfaction of the CPM that the CRS/alternate CRS has the appropriate training and experience to implement effectively the Conditions.

CULTURAL RESOURCES MONITORS

CRMs shall have the following qualifications:

- B.S. or B.A. degree in anthropology, archaeology, historical archaeology, or a related field, and one year experience monitoring in California; or
- A.S. or A.A. degree in anthropology, archaeology, historical archaeology, or a related field, and four years experience monitoring in California; or
- Enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology, or a related field, and two years of monitoring experience in California.

REQUIRED CULTURAL RESOURCES TECHNICAL SPECIALISTS

The project owner shall ensure that the CRS is qualified or obtains the services of a qualified prehistoric archaeologist to conduct the research specified in CUL-6. The Project Prehistoric Archaeologist's (PPA) training and background must meet the U.S. Secretary of the Interior's Professional Qualifications Standards for prehistoric archaeology, as published in Title 36, Code of Federal Regulations, part 61, and the resume of the PPA must demonstrate familiarity with the similar artifacts and environmental modifications (deliberate and incidental) to those associated with the prehistoric and protohistoric use of the Palo Verde Mesa. The PPA must meet OSHA standards as a "Competent Person" in trench safety.

The project owner shall ensure that the CRS is qualified or obtains the services of a qualified historical archaeologist to conduct the research specified in CUL-8. The Project Historical Archaeologist's (PHA) training and background must meet the U.S. Secretary of Interior's Professional Qualifications Standards for historical archaeology, as published in Title 36, Code of Federal Regulations, part 61. The resume of the PHA must demonstrate familiarity with the artifacts, environmental modifications (deliberate and incidental, including tank tracks), and trash disposal patterns associated with World War II land-based army activities, and knowledge of the full range of late nineteenth and early-to-mid-twentieth-century domestic can, bottle, and ceramic diagnostic traits.

The resumes of the CRS, alternate CRS, the PPA, and the PHA, and any other proposed technical specialists, shall be submitted to the CPM for approval and shall include the names and telephone numbers of contacts familiar with the work of these persons on projects

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referenced in the resumes and demonstrate to the satisfaction of the CPM that these persons have the appropriate training and experience to undertake the required research.

Verification:

1. At least 45 days prior to the start of ground disturbance, the project owner shall submit the resumes for the CRS and alternate(s) to the CPM for review and approval.
 2. At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall submit the resume of the proposed new CRS, if different from the alternate CRS, to the CPM for review and approval. At the same time, the project owner shall also provide to the proposed new CRS the AFC and all cultural resources documents, field notes, photographs, and other cultural resources materials generated by the project. If no alternate CRS is available to assume the duties of the CRS, the project owner shall designate a CRM to serve in place of a CRS for a maximum of 3 days. If cultural resources are discovered, ground disturbance shall remain halted until there is a CRS or alternate CRS to make a recommendation regarding significance.
 3. At least 20 days prior to ground disturbance, the CRS shall provide a letter naming CRMs and attesting that the identified CRMs meet the minimum qualifications for cultural resources monitoring required by this condition.
 4. At least 5 days prior to additional CRMs beginning on-site duties during the project, the CRS shall provide letters to the CPM identifying the new CRMs and attesting to their qualifications.
 5. At least 10 days prior to any technical specialists, other than CRMs, beginning tasks, the resume(s) of the specialists shall be provided to the CPM for review and approval. At least 10 days prior to the start of ground disturbance, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources conditions.
4. **Page 4.3-183, Condition of Certification CUL-4, 1st Paragraph, 1st sentence:** Please update the condition as indicated below to allow electronic copies to be submitted to minimize production and to make deliverables more efficient.

Page 4.3-183, Condition of Certification CUL-4, verification: Please update the verification as indicated below. This requirement is unnecessary as the public (including Native American tribes) will have access to all Monthly Compliance Reports.

CUL-4 Project Documents for Cultural Resources Personnel

Prior to the start of construction-related ground disturbance or grading, boring, and trenching, as defined in the General Conditions for this project; surface grading or subsurface soil work during pre-construction activities or site mobilization; or mowing activities and heavy equipment use in loose or sandy soils, at the project site, access roads, and linear facilities, if the CRS has not previously worked on the project, the project owner shall provide the CRS with electronic copies of the AFC, data responses, confidential cultural resources reports, all supplements, the Energy Commission cultural resources Final Staff Assessment, and the cultural resources conditions of certification from the Final Decision, for the project. The project owner shall also provide the CRS and the CPM with maps and drawings showing the footprints of the power plant, all linear facility routes, all access roads, and all laydown areas. Maps shall include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:24,000 or 1" = 200') for plotting cultural features or

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materials. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review map submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless such activities are specifically approved by the CPM.

If construction of the project would proceed in phases, maps and drawings not previously provided shall be provided to the CRS and CPM prior to the start of each phase. Written notice identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

Weekly, until ground disturbance is completed, the project construction manager shall provide to the CRS and CPM a schedule of project activities for the following week, including the identification of area(s) where ground disturbance will occur during that week.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

Verification:

1. At least 40 days prior to the start of ground disturbance, the project owner shall provide the AFC, data responses, confidential cultural resources documents, all supplements, cultural resources conditions of certification, and the FSA to the CRS, if needed, and the subject maps and drawings to the CRS and CPM. The CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities.
2. At least 15 days prior to the start of ground disturbance, if there are changes to any project-related footprint, the project owner shall provide revised maps and drawings for the changes to the CRS and CPM.
3. At least 15 days prior to the start of each phase of a phased project, the project owner shall submit the appropriate maps and drawings, if not previously provided, to the CRS and CPM.
4. Monthly, during ground disturbance, the project owner shall ~~email~~ provide a progress report to the CPM as part of the project's Monthly Compliance Report. ~~interested Native Americans and other interested parties.~~
5. Within 5 days of changing the scheduling of phases of a phased project, the project owner shall provide written notice of the changes to the CRS and CPM.

5. **Page 4.3-184:**

CUL-5 Cultural Resources Monitoring and Mitigation Plan (CRMMP)

Prior to the start of ground disturbance, the project owner shall submit the Cultural Resources Monitoring and Mitigation Plan (CRMMP), as prepared by, or under the direction of, the CRS, to the CPM for review and approval. The CRMMP shall follow the content and organization of the draft model CRMMP, provided by the CPM, and the authors' name(s) shall appear on the title page of the CRMMP. The CRMMP shall identify measures to minimize potential impacts to sensitive cultural resources. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, each CRM, and the project owner's on-site construction

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manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless such activities are specifically approved by the CPM.

The CRMMP shall include, but not be limited to, the following elements and measures:

1. The following statement included in the Introduction: “Any discussion, summary, or paraphrasing of the conditions of certification in this CRMMP is intended as general guidance and as an aid to the user in understanding the conditions and their implementation. The conditions, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the conditions in the CRMMP. The Cultural Resources conditions of certification from the Commission Decision are contained in Appendix A.”
2. A proposed general research design that includes a discussion of archaeological research questions and testable hypotheses specifically applicable to the project vicinity, and a discussion of artifact collection, retention/disposal, and curation policies as related to the research questions formulated in the research design. The research design will specify that the preferred treatment strategy for any buried archaeological deposits is avoidance. A specific mitigation plan shall be prepared for any unavoidable impacts to any CRHR-eligible (as determined by the CPM) resources. A prescriptive treatment plan may be included in the CRMMP for limited data types.
3. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the ground disturbance and post-ground-disturbance analysis phases of the project.
4. Identification of the person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team.
5. A description of the manner in which Native American observers or monitors, as required by Condition of Certification **CUL-12**, will be included, the procedures to be used to select them, and their role and responsibilities.
6. A description of all impact-avoidance measures (such as flagging or fencing) to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during ground disturbance, construction, and/or operation, and identification of areas where these measures are to be implemented. The description shall address how these measures would be implemented prior to the start of ground disturbance and how long they would be needed to protect the resources from project-related effects.
7. A statement that all encountered cultural resources 50 years old or older shall be recorded on the appropriate Department of Parks and Recreation (DPR) 523 form(s) and mapped and photographed. In addition, all archaeological materials retained as a result of the archaeological investigations (e.g., survey, testing, data recovery) shall be curated in accordance with the California State Historical Resources Commission’s Guidelines for the Curation of Archaeological Collections, into a retrievable storage collection in a public repository or museum.

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8. A statement that the project owner will pay all curation fees for artifacts recovered and for related documentation produced during cultural resources investigations conducted for the project. The project owner shall identify three possible curation facilities that could accept cultural resources materials resulting from project activities.
9. A statement demonstrating when and how the project owner will comply with Health and Human Safety Code 7050.5(b) and Public Resources Code 5097.98(b) and (e), including the statement that the project owner will notify the CPM and the Native American Heritage Commission (NAHC) of the discovery of human remains.
10. A statement that the CRS has access to equipment and supplies necessary for site mapping, photography, and recovery of any cultural resource materials that are encountered during ground disturbance and cannot be treated prescriptively.
11. A description of the contents, format, and review and approval process of the final Cultural Resource Report (CRR), which shall be prepared according to ARMR guidelines.

Verification:

1. After approval of the CRS proposed by the project owner, the CPM will provide to the project owner an electronic copy of the draft model CRMMP for the CRS.
2. At least 30 days prior to the start of data recovery required in **CUL-6** and **CUL-8**, the project owner shall submit the CRMMP to the CPM for review and approval.
3. At least 30 days prior to the start of ground disturbance, in a letter to the CPM, the project owner shall agree to pay curation fees for any materials generated or collected as a result of the archaeological investigations (survey, testing, data recovery).
4. Within 90 days after completion of ground disturbance (including landscaping), if cultural materials requiring curation were generated or collected, the project owner shall provide to the CPM a copy of an agreement with, or other written commitment from, a curation facility that meets the standards stated in the California State Historical Resources Commission's Guidelines for the Curation of Archaeological Collections, to accept the cultural materials from this project. Any agreements concerning curation will be retained and available for audit for the life of the project.

6. CUL-6 Data Recovery for Prehistoric Sites and Features:

Page 4.3-187: PLEASE NOTE: No condition was listed under **CUL-6**. In the PSA, the proposed PQAD was noted as a potential contributor to the proposed PTNCL. The PSA does not contain substantial evidence to support an eligibility finding using state or federal guidance for either the proposed PQAD or the proposed PTNCL. Therefore, there is no legal nexus for requiring mitigation. However, as noted in the comments to **CUL-1** above, the Applicant is willing to pay the fee which would necessarily cover the contributing elements including the proposed PQAD.

The Applicant reserves the right to provide comments to this condition once it is written.

7. CUL-7 Mitigation for Impacts to Ethnographic Resources:

Page 4.3-187 PLEASE NOTE: No condition was listed under **CUL-7**. The PSA does not contain substantial evidence to support an eligibility finding for the three proposed ethnographic landscapes using state or federal guidance and, therefore, the required legal nexus for

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mitigation has not been established. In addition, as a matter of law, requiring open-ended payment to out-of-state facilities cannot satisfy minimum constitutional nexus standards.

The Applicant reserves the right to provide comments to this condition once it is written.

8. **CUL-8 Data Recovery for DTC Maneuver Sites**

CUL-8 should be deleted. The PSA fails to provide substantial evidence that these thirty-two sites contribute to the proposed DTCCCL. Even if the Commission determines that these sites are contributing elements, they have been documented sufficiently such that no further mitigation is required. These types of features are already well documented in both the archaeological and historic record and are unlikely to provide subsurface data that would render it eligible. Furthermore, the CRMMP provides the necessary measures in which to assess any previously undiscovered buried artifacts found during construction monitoring. It should be noted that the Applicant, as part of unexploded ordnance (UXO) clearance, will conduct geophysical investigations of the site which will result in a subsurface mapping of anomalies. Subsurface metal anomalies detected will be excavated in accordance with **CUL-5**. Any additional data provided through the CRMMP process relating to DTC will be provided to the CPM. This construction element far exceeds the minimum requirements of **CUL-8**. Also, as noted in **CUL-2**, the Applicant has already agreed to pay the fee associated with further research associated with the proposed DTCCCL. Therefore, **CUL-8** is unnecessary.

~~**CUL-8 — Data Recovery for DTC Maneuver Sites**~~

~~Prior to the start of ground disturbance or grading, boring, and trenching, as defined in the General Conditions for this project; surface grading or subsurface soil work during pre-construction activities or site mobilization; or mowing activities and heavy equipment use in loose or sandy soils, at the project site, access roads, and linear facilities, the project owner shall hire a PHA with the qualifications described in **CUL-2** to supervise the data recovery at those DTC Maneuver Sites that the project will impact. The project owner shall ensure that the CRS and the PHA submit for CPM review and approval a data recovery plan for the impacted DTC Maneuver Sites. The plan must include, but is not limited to, the following:~~

- ~~1. Prior to beginning data recovery, the PHA and all field crew members shall be trained by the DTCCCL Historical Archaeologist, or equivalent qualified person approved by the CPM and hired by the project owner should the DTCCCL Historical Archaeologist not be available, in the identification, analysis and interpretation of the artifacts, environmental modifications, and trash disposal patterns associated with the early phases of WWII land based U.S. army activities, as researched and detailed by the DTCCCL PI Historian and the DTCCCL Historical Archaeologist.~~
- ~~2. Prior to beginning the data recovery, the field crew members shall also be trained in the consistent and accurate identification of the full range of late nineteenth and early to mid-twentieth-century can, bottle, and ceramic diagnostic traits.~~
- ~~3. Prior to the start of ground disturbance or grading, boring, and trenching, as defined in the General Conditions for this project; surface grading or subsurface soil work during pre-construction activities or site mobilization; or mowing activities and heavy~~

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equipment use in loose or sandy soils, at the project site, access roads, and linear facilities, a geophysical survey is completed that meets these requirements:

- a. Use hand held magnetometer equipment (e.g., the Schonstedt GA 52C magnetic locator) that will detect buried metallic items or a dipole soil conductivity meter (e.g., the Geonics EM 031) that will detect changes in the soil that may indicate the presence of buried cultural materials and features.
- b. Identify significant buried deposits. Small or isolated finds (such as isolated nails or small and amorphous metal pieces) will not be recorded; only buried deposits representing multiple artifacts will be tested and possibly excavated.
- c. Analysis of the results of the geophysical survey and determination of which subsurface deposits are new features that will be tested, possibly excavated, and recorded as follows:
 - i. Four or more shovel test probes (STPs) will be used to ground truth each geophysical anomaly;
 - ii. Possible expansion to larger unit exposure will be done if buried deposits are present and a feature's vertical extent needs to be determined;
 - iii. Complete feature excavation by the PHA will be done of all buried deposits found by the geophysical survey, with attention to possible stratigraphy;
 - iv. Detailed in-field analysis of all artifacts found in buried deposits identified by the geophysical survey will be done, documenting the measurements and the types of seams and closures for each bottle, and the measurements, seams, closure, and opening method for all cans. Photographs will be taken of maker's marks on bottles, any text or designs on bottles and cans, and of decorative patterns and maker's marks on ceramics. Artifacts, unless unique, will not be collected.
 - v. All buried deposits will be mapped, measured, photographed, and fully described in writing. All contents of buried deposits will be mapped, measured, photographed, and fully described in writing.
 - vi. DPR site forms will be updated with information from the new features
4. The project owner shall ensure that the original site map shall be updated to include at minimum: landform features such as small drainages, any man-made features, the limits of any artifact concentrations and features (previously known and newly found in the geophysical survey), using location recordation equipment that has the latest technology with sub-meter accuracy (and to the standard of UTM 11 North or California Teale Albers, or equivalent).
5. The project owner shall ensure that the details of what is found at each site is presented in a letter report from the CRS or PHA, to which are attached the DPR form for the site updated with new features, which shall serve as a preliminary report for each site, as follows:
 - a. Letter reports shall address just one site;

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- b. ~~The letter report shall include, but is not limited to, a description of the schedule and methods used in the field effort, a preliminary tally of the numbers and types of features and deposits that were found, and a map showing the location of excavation units, including topographic contours and the site landforms.~~
- c. ~~The letter report shall make a recommendation on whether each site is a contributor to the DTTCL.~~
- 6. ~~The project owner shall ensure that the data collected from the field work shall be provided to the DTCCL PI Historian to assist in the determination of which, if any, of the historic-period sites are contributing elements to the DTCCL.~~
- 7. ~~The project owner shall ensure that the PHA analyzes all recovered data and writes or supervises the writing of a comprehensive final report of the data collection on impacted DTC Maneuver Sites. This report shall be included in the CRR (CUL 15). Relevant portions of the information gathered shall be included in the possible NRHP nomination for the DTCCL.~~

Verification:

- 1. ~~At least 120 days prior to ground disturbance, the project owner shall submit for CPM review and approval a data recovery plan for impacted DTC Maneuver Sites.~~
- 2. ~~At least 105 days prior to ground disturbance, the project owner shall notify the CPM that required crew training (in the identification, analysis and interpretation of the DTC artifacts, environmental modifications, and trash disposal patterns and in the consistent and accurate identification of the full range of late nineteenth and early to mid twentieth-century can, bottle, and ceramic diagnostic traits) has taken place.~~
- 3. ~~At least 90 days prior to ground disturbance, the project owner shall notify the CPM on what date the geophysical survey and data recovery on impacted DTC Maneuver Sites will begin.~~
- 4. ~~Within one week of completing data recovery at a site, the project owner shall submit to the CPM for review and approval a letter report written by the CRS and/or the PHA, evidencing that the data recovery at each impacted DTC Maneuver Sites site has been completed. When the CPM approves the letter report, ground disturbance may begin at the site location(s) that are the subject of the letter report.~~
- 9. **Page 4.3-189:** With regard to the requirement to develop a documentary focused on the infantry in the DTC, Applicant is aware that a film addressing this exact topic has already been prepared for the Rice Solar Energy Project and does not believe a second documentary is warranted; therefore, Applicant requests that CUL-9 be modified as shown below.

CUL 9 — Preparation of a Documentary Focused on the Infantry in the DTC

~~The project owner shall produce a high-definition, broadcast quality documentary on the training of the infantry and integrated infantry (including motorized infantry), army engineers, and armor in the Desert Training Center. Costs for the documentary (including pre- and post-production costs) shall be required not to exceed the industry average of \$4,500.00 per minute. The final edited documentary shall be at least 26 minutes in length, excluding titles and credits. An approximately 10-minute abbreviated version of the~~

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documentary shall also be produced using primary material from the 26-minute documentary. Copies of the resulting documentary film shall be presented to the Patton Museum, as well as the Infantry School at Fort Benning, Georgia.

Prior to the start of filming, the project owner shall provide the qualifications of the proposed production company to the Executive Director of the General Patton Memorial Museum for review and comment, and to the CPM for review and approval. The production company shall have experience in the creation of historic documentary-style videos, and shall provide evidence of the successful completion of at least three videos of similar quality from project development to release. A copy of any scope of work related to the production of the documentary shall be submitted to the CPM within 10 days of execution.

Prior to the start of filming, the project owner shall also submit the resume of a proposed production advisor to the CPM for review and approval. The production advisor shall be a qualified historian, with training and experience consistent with the requirements of the U.S. Secretary of Interior's Professional Qualifications Standards, as published in Title 36, Code of Federal Regulations, part 61. In addition, the advisor must have experience researching and documenting historic military resources, preferably within the DTCCL. The production advisor shall provide direction during production and post-production to ensure historical accuracy and provide assistance obtaining historic WWII documentation (e.g., military film and training footage, news clips, still photos, audio, and written transcripts of interviews) and the most recent information on Camp Hyder and the 77th Infantry Division in particular, and the DTC/C-AMA in general.

Historic film, still photos, re-creations, interview footage and audio tracks, and compatible, high-quality video footage of the subject areas taken prior to current filming may also be integrated into the final product. The original acquisition format shall be high definition, 16X9, 1080p digital format, using broadcast-level cameras and lenses.

Prior to the start of site mobilization, the production company shall make a filmed interview of Colonel (Ret.) Theodore ("Ted") Bell, a former company commander with the 307th Infantry Regiment of the 77th Infantry Division who was stationed at Camp Hyder in 1943 and participated in the maneuvers in June of that year.

Prior to the start of production editing, the owner shall submit a first draft script, storyboard, and description of other related project elements, including proposed finished length of the documentary (a minimum of 26 minutes of edited footage for the full-length version and 10 minutes for the abbreviated (excerpt) version), to the DTCCL PI Historian, production advisor, and Executive Director of the General Patton Memorial Museum for review and comment, and to the CPM for review and approval.

Prior to the start of Rio Mesa SEGF operations, the project owner shall submit the final cut, with voice-over and background music track, along with packaging proofs, including sample cover, disk label, and packaging materials, to the DTCCL PI Historian, production advisor, and Executive Director of the General Patton Memorial Museum for review and comment, and to the CPM for review and approval.

Concurrent with the start of Rio Mesa SEGF operations, the project owner shall provide the final approved full-length documentary to the General Patton Memorial Museum in a high

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definition format, suitable for mass market duplication, along with 500 DVD copies and 100 BluRay copies of the full length packaged documentary, suitable for resale. Ten DVD copies and five BluRay copies of the packaged documentary shall also be provided to the BLM Palm Springs South Coast Field Office and the CPM. The 10-minute excerpt shall be provided to all parties in a digital format compatible with the display requirements of the Museum and the webcasting requirements of the Energy Commission.

In conjunction with delivery of the final approved documentary in the designated format, the project owner shall provide a letter to the General Patton Memorial Museum confirming that the Museum is assigned and shall exclusively retain all DVD, BluRay, and video reproduction and sales rights, and broadcast television distribution rights of the production, both foreign and domestic, excepting use of excerpts from the documentary [including the 10-minute abbreviated documentary in any Bureau of Land Management or Energy Commission website related to DTC/C-AMA, southern California Desert history, or renewable energy projects within former DTC/C-AMA areas. The letter shall also confirm that the production company may retain copies of the production specifically for promotional and demonstration purposes only. Copies of the letter shall be sent to the CPM and the production company representative.

The project owner shall ensure that all raw footage acquired during the production of the documentary is submitted to the DTCCL PI Historian for use in the DTCCL study. Use of the footage for research purposes shall not be restricted. Ten DVD copies and five BluRay copies of the packaged documentary shall also be provided to the DTCCL PI Historian.

Verification:

1. Within 10 days of execution, the project owner shall submit to the CPM a copy of the scope of work associated with any contract related to the production of the documentary.
2. At least 15 days prior to the start of filming, the project owner shall provide the qualifications of the proposed production company to the Executive Director of the General Patton Memorial Museum for review and comment, and to the CPM for review and approval.
3. At least 15 days prior to the start of filming, the project owner shall submit the resume of a proposed production advisor to the CPM for review and approval.
4. At least 90 days prior to the start of site mobilization, the production company shall shoot the initial footage of the interview with Colonel Bell and obtain footage of films made during army training of infantry and armor forces in the DTC, with particular emphasis on Camp Hyder and other infantry camps within the DTC/C-AMA.
5. At least 30 days prior to the start of production editing, the project owner shall submit a first draft script, storyboard, and description of other related project elements, including proposed finished length of the documentary (a minimum of 26 minutes of edited footage), to the DTCCL PI Historian, production advisor, and Executive Director of the General Patton Memorial Museum for review and comment, and to the CPM for review and approval.
6. At least 90 days prior to the start of Rio Mesa SEGF operations, the project owner shall submit the final cut, with voice over and background music track, along with packaging proofs, including sample cover, disk label, and packaging materials, to the DTCCL PI Historian,

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production advisor, and Executive Director of the General Patton Memorial Museum for review and comment, and to the CPM for review and approval.

7. Concurrent with the start of Rio Mesa SEGf operations, the project owner shall provide the final approved documentary to the General Patton Memorial Museum in a high definition format, suitable for mass market duplication, along with 500 DVD copies and 100 BluRay copies of the full length packaged documentary, suitable for resale. Ten DVD copies and five BluRay copies of the packaged documentary shall also be provided to the BLM Palm Springs South Coast Field Office and the CPM.

8. In conjunction with delivery of the final approved documentary in the designated format, the project owner shall provide a letter to the Executive Director of the General Patton Memorial Museum confirming that the Museum is assigned and shall exclusively retain all DVD, BluRay, and video reproduction and sales rights, and broadcast television distribution rights of the production, both foreign and domestic, excepting use of excerpts from the documentary (including the 10 minute abbreviated documentary on any Bureau of Land Management or Energy Commission website related to DTC/C-AMA, military history, or energy projects in the southern California desert. The letter shall also confirm that the production company may retain copies of the production specifically for promotional and demonstration purposes only. Copies of the letter shall be sent to the CPM and the production company representative.

9. Within 180 days from the start of construction, the project owner shall ensure that all raw footage acquired during the production of the documentary is submitted to the DTCCL PI-Historian for use in the DTCCL study. Use of the footage for research purposes shall not be restricted. Ten DVD copies and five BluRay copies of the packaged documentary shall also be provided to the DTCCL PI-Historian.

10. **Page 4.3-187: PLEASE NOTE:** No condition was listed under **CUL-10**.

The PSA provides no evidence to support a finding of eligibility for the Palo Verde Irrigation District (PVID) as noted in the general and specific comments above. There will be no impacts to the existing drain crossings along the Bradshaw Trail (the existing road will be paved and the drain crossing will be reinforced by use of a Bailey's Bridge type structure, which will avoid impacts to the drain). In addition, the construction activities contemplated for crossing the two existing drains along 34th Avenue would be north of the existing structures and completely separate. The new crossings will span the drains without touching them and will not compromise the integrity of the features in PVID.

The Applicant reserves the right to provide comments to this condition once it is written.

11. **CUL-11 Worker Environmental Awareness Program (WEAP) Training**

Page 4.3-193: Please note one minor clarification to the condition to clarify halting construction only in the immediate area of the discovery not for the whole project as noted below.

Prior to, and for the duration of, ground disturbance, the project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas. The cultural resources part of this training shall be prepared by the CRS, may be conducted by any member of the archaeological team,

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and may be presented in the form of a video. During the training and during construction, the CRS shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when ground disturbance is completed or suspended, but must be resumed when ground disturbance, as described in detail in **CUL-1**, resumes.

The training shall include:

1. A discussion of applicable laws and penalties under law;
2. Samples or visuals of artifacts that might be found in the project vicinity;
3. A discussion of what such artifacts may look like when partially buried, or wholly buried and then freshly exposed;
4. A discussion of what prehistoric and historical archaeological deposits look like at the surface and when exposed during construction, and the range of variation in the appearance of such deposits;
5. Instruction that the CRS, alternate CRS, and CRMs have the authority to halt ground disturbance in the immediate area of a discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;
6. Instruction that employees, if the CRS, alternate CRS, or CRMs are not present, are to halt work on their own in the vicinity of a potential cultural resources discovery, and shall contact their supervisor and the CRS or CRM, and that redirection of work would be determined by the construction supervisor and the CRS;
7. An informational brochure that identifies reporting procedures in the event of a discovery;
8. An acknowledgement form signed by each worker indicating that they have received the training; and
9. A sticker that shall be placed on hard hats indicating that environmental training has been completed. No ground disturbance shall occur prior to implementation of the WEAP program, unless such activities are specifically approved by the CPM.

Verification:

1. At least 30 days prior to the beginning of ground disturbance, the CRS shall provide the cultural resources WEAP training program draft text, including Native American participation, graphics, and the informational brochure to the CPM for review and approval.
2. At least 15 days prior to the beginning of ground disturbance, the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign.
3. Monthly, until ground disturbance is completed, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of workers who have completed the training in the prior month and a running total of all persons who have completed training to date.

12. **Page 4.3-194:** Please note minor clarifications to the condition below to add clarify and flexibility to the Applicant.

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CUL-12 Notice of Ground Disturbance, Construction Monitoring Program

Prior to the start of construction-related ground disturbance or grading, boring, and trenching, as defined in the General Conditions for this project; or surface grading or subsurface soil work during pre-construction activities or site mobilization; or mowing activities and heavy equipment use in loose or sandy soils at the project site, access roads, and linear facilities, the project owner shall notify the CPM ~~and all interested Native Americans~~ of the date on which ground disturbance will ensue. The project owner shall ensure that the CRS, alternate CRS, or CRMs monitor, ~~full-time,~~ all the above specified ground disturbance at the project site, along the linear facilities routes in California, and at laydown areas, roads, and other ancillary areas, to ensure there are no impacts to undiscovered resources and to ensure that known resources are not impacted in an unanticipated manner.

~~Full-time~~ a Archaeological monitoring for this project shall be the archaeological monitoring of ground-disturbing activities in the areas specified in the previous paragraph, for as long as the activities are ongoing. Where excavation equipment is actively removing dirt and hauling the excavated material farther than fifty feet from the location of active excavation, ~~full-time~~ archaeological monitoring shall require at least two monitors per excavation area. In this circumstance, one monitor shall observe the location of active excavation and a second monitor shall inspect the dumped material. For excavation areas where the excavated material is dumped no farther than fifty feet from the location of active excavation, one monitor shall both observe the location of active excavation and inspect the dumped material.

A Native American monitor shall be obtained to monitor ground disturbance in areas where Native American artifacts may be discovered. Contact lists of interested Native Americans and guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that shall be monitored. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM. The CPM will either identify potential monitors or will allow ground disturbance to proceed without a Native American monitor.

The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered.

On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resources activities and any instances of non-compliance with the conditions and/or applicable LORS. Copies of the daily monitoring logs shall be provided by the CRS to the CPM, if requested by the CPM. From these logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended.

The CRS or alternate CRS shall report daily to the CPM on the status of the project's cultural resources-related activities, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM.

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In the event that the CRS believes that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring.

The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resources monitoring and mitigation activities with Energy Commission technical staff.

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these conditions.

Upon becoming aware of any incidents of non-compliance with the conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM by telephone or e-mail within 24 hours. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the C conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

Verification:

1. At least 30 days prior to the start of ground disturbance, the CPM will notify all Native Americans with whom the Energy Commission communicated during the project review of the date on which the project's ground disturbance will begin.
2. At least 30 days prior to the start of ground disturbance, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log.
3. Monthly, while monitoring is on-going, the project owner shall include in each MCR a copy of the monthly summary report of cultural resources-related monitoring prepared by the CRS and shall attach any new DPR 523A forms completed for finds treated prescriptively, as specified in the CRMMP.
4. At least 24 hours prior to implementing a proposed change in monitoring level, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for changing the monitoring level.
5. Daily, as long as no cultural resources are found, the CRS shall provide a statement that "no cultural resources over 50 years of age were discovered" to the CPM as an e-mail or in some other form of communication acceptable to the CPM.
6. At least 24 hours prior to reducing or ending daily reporting, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for reducing or ending daily reporting.
7. No later than 30 days following the discovery of any Native American cultural materials, the project owner shall submit to the CPM copies of the information transmittal letters sent to the chairpersons of the Native American Tribes or groups who requested the information. Additionally, the project owner shall submit to the CPM copies of letters of transmittal for

CULTURAL RESOURCES

all subsequent responses to Native American requests for notification, consultation, and reports and records.

13. **Page 4.3-196:** Please note minor clarifications to the condition/verification below.

CUL-13 Authority to Halt Ground Disturbance, Treatment of Discoveries

The project owner shall grant authority to halt ground disturbance in the immediate area of the discovery to the CRS, alternate CRS, and the CRMs in the event of a cultural resources discovery. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event that a cultural resource over 50 years of age is found (or if younger, determined exceptionally significant by the ~~CRS CPM~~), or impacts to such a resource can be anticipated, ground disturbance shall be halted or redirected in the immediate vicinity of the discovery sufficient to ensure that the resource is protected from further impacts. If the discovery includes human remains, the project owner shall comply with the requirements of Health and Human Safety Code § 7050.5(b) and shall notify the CPM and the NAHC of the discovery of human remains. No action shall be initiated without direction from the CPM. Monitoring and daily reporting, as provided in other conditions, shall continue during the project's ground-disturbing activities elsewhere. After the discovery of human remains, cultural resources monitoring of ground disturbance shall continue or be initiated, and shall include a Native American monitor pursuant to requirements in these conditions of certification. The halting or redirection of ground disturbance shall remain in effect until the CRS has visited the discovery, and all of the following have occurred:

1. The CRS has notified the project owner, and the CPM has been notified within 24 hours of the discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning, including a description of the discovery (or changes in character or attributes), the action taken (i.e., work stoppage or redirection), a recommendation of CRHR eligibility, and recommendations for data recovery from any cultural resources discoveries, whether or not a determination of CRHR eligibility has been made.
2. If the discovery would be of interest to Native Americans, the CRS has notified all Native American groups that have requested to be notified in the event of such a discovery within 24 hours of the discovery.
3. The CRS has completed field notes, measurements, and photography for a DPR 523 "Primary" form. Unless the find can be treated prescriptively, as specified in the CRMMP, the "Description" entry of the DPR 523 "Primary" form shall include a recommendation on the CRHR eligibility of the discovery. The project owner shall submit completed forms to the CPM.
4. The CRS, the project owner, and the CPM have conferred, and the CPM has concurred with the recommended eligibility of the discovery and approved the CRS's proposed data recovery, if any, including the curation of the artifacts, or other appropriate mitigation; and any necessary data recovery and mitigation have been completed. Ground disturbance may resume only with the approval of the CPM.

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Verification:

1. At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, alternate CRS, and CRMs have the authority to halt ground disturbance in the immediate vicinity of a cultural resources discovery, and that the project owner shall ensure that the CRS notifies the CPM within 24 hours of a discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning.
 2. Unless the discovery can be treated prescriptively, as specified in the CRMMP, completed DPR 523 forms for resources newly discovered during ground disturbance shall be submitted to the CPM for review and approval no later than 24 hours following the notification of the CPM, or 48 hours following the completion of data recordation/recovery, whichever the CRS decides is more appropriate for the subject cultural resource.
 3. Within 48 hours of the discovery of a resource of interest to Native Americans, the project owner shall ensure that the CRS notifies all Native American groups that expressed a desire to be notified in the event of such a discovery, and the CRS must inform the CPM when the notifications are complete.
 4. No later than 30 days following the discovery of any Native American cultural materials, the project owner shall submit to the CPM copies of the information transmittal letters sent to the chairpersons of the Native American Tribes or groups who requested the information. Additionally, the project owner shall submit to the CPM copies of letters of transmittal for all subsequent responses to Native American requests for notification, consultation, and reports and records.
 5. Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by Native Americans in response to the project owner's transmittals of information.
14. **Page 4.3-198:** The Applicant will not be utilizing soil borrow and/or disposal sites so requests this condition be removed as non-applicable.

CUL 14 — Use of Soil Borrow and Disposal Sites

~~If fill soils must be acquired from a non-commercial borrow site or disposed of to a non-commercial disposal site, unless less than five-year-old surveys of these sites for archaeological resources are documented and approved by the CPM, the CRS shall survey the borrow and/or disposal site/s for cultural resources and record on DPR 523 forms any that are identified. When the survey is completed, the CRS shall convey the results and recommendations for further action to the project owner and the CPM, who will determine what, if any, further action is required. If the CPM determines that significant archaeological resources that cannot be avoided are present at the borrow site, other conditions shall apply. The CRS shall report on the methods and results of these surveys in the final CRR.~~

Verification:

1. ~~As soon as the project owner knows that a non-commercial borrow site and/or disposal site will be used, he/she shall notify the CRS and CPM and provide documentation of previous archaeological survey, if any, dating within the past five years, for CPM approval.~~
2. ~~In the absence of documentation of recent archaeological survey, at least 30 days prior to any soil borrow or disposal activities on the non-commercial borrow and/or disposal sites, the~~

CULTURAL RESOURCES

CRS shall survey the site/s for archaeological resources. The CRS shall notify the project owner and the CPM of the results of the cultural resources survey, with recommendations, if any, for further action.

15. **Page 4.3-198:** Please add the word monitoring in front of report in all instances in the condition and verification to clarify that this condition refers to the post-construction monitoring report not the Applicant's Draft Cultural Resources Technical Report.

CUL-15 Final Cultural Resources Monitoring Report

The project owner shall submit the final Cultural Resources Monitoring Report (CRMR) to the CPM for approval. The final CRMR shall be written by or under the direction of the CRS and shall be provided in the ARMR format. The final CRMR shall report on all field activities including dates, times and locations, results, samplings, and analyses. All survey reports, DPR 523 forms, data recovery reports, and any additional research reports not previously submitted to the California Historical Resource Information System (CHRIS) and the State Historic Preservation Officer (SHPO) shall be included as appendices to the final CRMR.

If the project owner requests a suspension of ground disturbance and/or construction activities, then a draft CRMR that covers all cultural resources activities associated with the project shall be prepared by the CRS and submitted to the CPM for review and approval. The draft CRMR shall be retained at the project site in a secure facility until ground disturbance and/or construction resumes or the project is withdrawn. If the project is withdrawn, then a final CRMR shall be submitted to the CPM for review and approval at the same time as the withdrawal request.

Verification:

1. Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CRMR to the CPM for review and approval.
2. Within 90 days after completion of ground disturbance (including landscaping), the project owner shall submit the final CRMR to the CPM for review and approval. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.
3. Within 10 days after CPM approval of the CRMR, the project owner shall provide documentation to the CPM confirming that copies of the final CRMR have been provided to the SHPO, the CHRIS, the curating institution, if archaeological materials were collected, and to the Tribal chairpersons of any Native American groups requesting copies of project-related reports.

Appendix A

1. **Page 4.3-272, Table A-3:** Applicant suggests revising Table A-3 Archaeological Resources Identified in the Rio Mesa SEGF Vicinity but Excluded from the PAA consistent with the information provided under separate and confidential cover in Confidential Attachment A, as applicable.
2. **Page 4.3-288, Table A-4:** Applicant suggests revising Table A-4 Archaeological Resources Identified in the Rio Mesa SEGF Vicinity but Excluded from the PAA and replace with the

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information provided in Attachment A, as applicable under separate and confidential cover in Confidential Attachment A.

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

**Applicant's General Comments and Comments to Conditions of Certification
on the Preliminary Staff Assessment**

HAZARDOUS MATERIALS

GENERAL COMMENTS

No general comments.

FINDINGS OF FACT

No findings of fact are listed in the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

1. **Page 4.4-16, HAZ-3:** Please revise the condition language as follows to reflect that a Safety Management Plan should only be required for hazardous materials that are delivered in large quantities, not for smaller containers of materials such as totes or paints. Please revise the verification language as follows to reflect that 30 days should be sufficient time for the CPM to review the plan.

HAZ-3 The project owner shall develop and implement a Safety Management Plan for delivery of liquid hazardous materials by tanker truck. The plan shall include procedures, protective equipment requirements, training and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of incompatible hazardous materials. This plan shall be applicable during construction, commissioning, and operation of the power plant.

Verification: At least sixty (60) days prior to the delivery of any liquid hazardous material to the facility (or such time as agreed upon by the project owner and the CPM), the project owner shall provide a Safety Management Plan as described above to the CPM for review and approval.

2. **Page 4.4-16, HAZ-4:** Please remove the time frame reference from the first sentence of HAZ-4 as follows since this is already referred to in the verification.

~~**HAZ-4** At least thirty (30) days prior to commencing construction, a~~ A site-specific Construction Site Security Plan for the construction phase shall be prepared and made available to the CPM for review and approval.

3. **Page 4.4-17, HAZ-5:** Please revise Item 6(b) within the condition as well as the verification language as follows:

HAZARDOUS MATERIALS

6b. A statement(s) (refer to sample, attachment “B”) signed by the contractor or authorized representative(s) for any permanent contractors or other technical contractors (as determined by the CPM after consultation with the project owner) that are present at any time on the site to repair, maintain, investigate, or conduct any other technical duties involving critical components (as determined by the CPM after consultation with the project owner) certifying that background investigations have been conducted on contractor personnel that visit the project site. Background investigations shall be restricted to ascertaining the accuracy of employee identity and employment history, and shall be conducted in accordance with state and federal law regarding security and privacy.

Verification: At least 30 days prior to the initial receipt of hazardous materials on-site (or such time as agreed upon by the project owner and the CPM), the project owner shall notify the CPM that a site-specific Operations Site Security Plan is available for review and approval. In the Annual Compliance Report, the project owner shall include a statement that all current project employee and appropriate contractor background investigations have been performed, and updated certification statements are appended to the Operations Security Plan. In the Annual Compliance Report, the project owner shall include a statement that the Operations Security Plan includes all current hazardous materials transport vendor certifications for security plans and employee background investigations.

REFERENCES

1. Please add the following additional reference:

BS 2012v – BrightSource/t. Stewart, Applicant’s Supplemental Data Response Number Four, Set 1A (#16 and #26): “Applicant’s Environmental Enhancement Proposal” - Docket 11-AFC-04. Submitted to CEC Dockets Unit on July 23, 2012.

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

**Applicant's General Comments and Comments to Conditions of Certification
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LAND USE

GENERAL COMMENTS

1. The PSA should find that there are noteworthy public benefits to land use from the project. The PSA mentions that development of the project is intended to address the requirements of federal and state mandates to develop renewable energy sources, but incorrectly notes that no noteworthy public benefits created by the project have been identified for this analysis (land use). The PSA land use section should recognize that the project will put unutilized private property owned by Metropolitan Water District to productive use, will increase property and sales and use tax revenues for local government, will create jobs and will advance state and federal renewable energy generation goals.
2. Applicant recognizes that Staff's analysis of Agriculture and Forestry Resources, Section A, pages 4.5-8 through 4.5-10, is correct to suggest that upon implementation of LAND-1, the project would create a less than significant impact on the environment. Additionally, Applicant concurs with Staff that the California Agricultural Land Evaluation and Site Assessment Model (LESA) is an appropriate tool to assess the project's soil quality and general availability/suitability for farming. Applicant also agrees with Staff that the soil quality within the project site is not prime, unique, or farmland of statewide importance. Staff performed the LESA model for each of the two drainage upgrades noted at 30th and S.R. 78; and on 34th Avenue at the C-2 canal crossing as shown on Land Use Figure 8. Page 4.5-10 concludes that the two drainage crossing upgrades resulted in a LESA final score of 59.15 and 68.73. A score of 59.15 is only significant if the Land Evaluation (LE) and Site Assessment (SA) subscores are each greater than or equal to 20 points. A score of 68.73 is considered significant unless either LE or SA subscore is less than 20 points. Staff evaluated the impacted to prime farmland based on an environmental study area, and not on the actual anticipated permanent impacts from construction of the new crossings. Due to the presence of a farm road on either side of the C-2 canal, Applicant has calculated that no permanent impact to prime farmland would occur due to the crossing of the canal with the new road. Similarly, Applicant does not anticipate any impact on prime farmland due any canal crossings on 30th Avenue/Bradshaw Trail. Since no impacts occur from upgrades to these drainage crossings, no LESA modeling is required.

FINDINGS OF FACT

No findings of fact listed are listed in this section of the PSA.

CONDITIONS OF CERTIFICATION

1. As explained in General Comment 2, construction of the project drainage crossings will not impact agricultural land and, therefore, **LAND-1** should be deleted in its entirety.

LAND USE

~~**LAND-1** The project owner shall restore disturbed agricultural land used during construction activities for the upgrading of two (2) drainage crossings; the drainage crossing near the corner of 30th Avenue and State Highway 78, and the drainage crossing on 34th Avenue closest to State Highway 78 shown on Land Use Figure 8 in the Energy Commission Staff Assessment.~~

~~The project owner shall submit to the Compliance Project Manager (CPM) for approval a restoration plan that with its full implementation will satisfy this requirement. The plan, at a minimum, shall show the area(s) to be restored, identify what is to be planted, and a schedule for the planting.~~

~~**Verification:** No more than 30 days following completion of the drainage improvements at both locations, the project owner shall submit the agricultural land restoration plan to the CPM for approval.~~

~~If the CPM notifies the project owner that any revisions of the agriculture land restoration plan are needed, within 30 days of receiving that notification the applicant shall submit to the CPM a plan with the specified revisions.~~

~~The project owner shall complete the agriculture land restoration within 90 days after approval of the plan by the CPM.~~

~~The project owner shall notify the CPM within seven days after completion of restoration that the restored area(s) is ready for inspection.~~

2. Reversions to acreage and parcel merger are distinct concepts and project owner, as a lessee, cannot file a reversionary map application without land owner approval. Accordingly, please revise **LAND-2** as follows:

~~**LAND-2** Prior to the start of construction, the project owner shall cause the filing with the County of Riverside Planning Department a "Reversionary Map" prepared in accordance to the provisions of the State Subdivision Map Act and the applicable provisions of County of Riverside Ordinance No. 460.151 merging combining individual parcels within the boundary of the project site to create a single parcel. The project owner shall provide to the CPM a copy of the recorded "Reversionary Map" filed with the County of Riverside Assessor-County Clerk-Recorder.~~

~~**Verification:** Thirty (30) days prior to the start of construction, the project owner shall provide to the CPM a copy of the recorded "Reversionary Map" final parcel map filed with the County of Riverside Assessor-County Clerk-Recorder.~~

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
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**Applicant's General Comments and Comments to Conditions of Certification
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NOISE AND VIBRATION

GENERAL COMMENTS

No general comments.

FINDINGS OF FACT

No findings of fact listed are listed in the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

1. **Page 4.6-12, NOISE-1:** Please revise NOISE-1 to move the timeframe for complying with the condition to the Verification language:

NOISE-1 ~~At least 15 days prior~~ Prior to the start of ground disturbance, the project owner shall notify all residents within one mile of the project site boundaries and ½-mile of the linear facilities, by mail, or by other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours a day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction where it is visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: ~~At least 15 days prior~~ prior to ground disturbance, the project owner shall transmit to the compliance project manager (CPM) a statement, signed by the project owner's project manager, stating that the above notification has been performed, and describing the method of that notification. This communication shall also verify that the telephone number has been established and posted at the site, and shall provide that telephone number.

2. **Pages 4.6-12 and 13, NOISE-2:** Applicant does not see any need or benefit in filing a copy of the Noise Complaint Resolution Form with the County and recommends that NOISE-2 be modified as follows:

NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all

NOISE AND VIBRATION

legitimate project-related noise complaints. The project owner or authorized agent shall:

- use the Noise Complaint Resolution Form (below), or a functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
- attempt to contact the person(s) making the noise complaint within 24 hours;
- conduct an investigation to determine the source of noise in the complaint;
- if the noise is project related, take all feasible commercially reasonable measures to reduce the ~~source of the~~ noise levels at the receptor; and
- submit a report documenting the complaint and actions taken. The report shall include: a complaint summary, including the final results of noise reduction efforts and, if obtainable, a signed statement by the complainant, stating that the noise problem has been resolved to the complainant's satisfaction.

Verification: Within five days of receiving a noise complaint, the project owner shall file a Noise Complaint Resolution Form, shown below, with ~~both the local jurisdiction and~~ the CPM that documents the resolution of the complaint. If mitigation is required to resolve the complaint, and the complaint is not resolved within a three-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is implemented ~~performed and complete~~.

3. **Pages 4.6-13 and 14, NOISE-4:** Due primarily to the higher predicted startup operation noise level for LT1a as presented in Table 5.7-14 on Page 5.7-13 of the Supplemental Response to DR Set 1A (#16 and #26), identified as "BS 2012v" in the PSA, and Applicant's usage to date of a wind-neutral sound propagation prediction scenario for modeling project operation noise, please change NOISE-4 as follows:

NOISE-4 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the operation of the project will not cause the noise levels due to plant operation alone to exceed a daily average of ~~393~~ dBA L_{eq} measured at or near monitoring location LT1a.

Verification: No new pure-tone components, with "pure tone" as defined in Noise Table A1, shall be caused by the project. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints⁴.

⁴ A legitimate complaint refers to a complaint about noise that is caused by the Rio Mesa SEGF project as opposed to another source (as verified by the CPM). A legitimate complaint constitutes a violation by the project of any noise condition of certification (as confirmed by the CPM), which is documented by an individual or entity affected by such noise.

NOISE AND VIBRATION

When the project first achieves a sustained output of 90 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey at monitoring location LT1a, or at a closer location acceptable to the CPM. This survey shall also include measurements of one-third octave band sound pressure levels to ensure that no new pure-tone noise components have been caused by the project.

The measurement of power plant noise for the purposes of demonstrating compliance with this condition of certification may alternatively be made at a location, acceptable to the CPM, closer to the plant (e.g., 400 feet from the plant boundary) and this measured level then mathematically extrapolated to determine the plant noise contribution at the affected residence. The character of the plant noise shall be evaluated at the affected receptor location to determine the presence of pure tones or other dominant sources of plant noise.

If the results from the noise survey indicate that the power plant noise at the affected receptor site exceeds the above value during the above time period, mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.

If the results from the noise survey indicate that pure tones are present, mitigation measures shall be implemented to reduce ~~eliminate~~ the pure tones.

Verification: The survey shall take place within 30 days of the project first achieving a sustained output of 90 percent or greater of rated capacity. Within 15 days after completing the survey, the project owner shall submit a summary report of the survey to the CPM. Included in the survey report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limit, and a schedule, subject to CPM approval, for implementing these measures. When these measures are in place, the project owner shall repeat the noise survey.

Within 15 days of completion of the new survey, the project owner shall submit to the CPM a summary report of the new noise survey, performed as described above and showing compliance with this condition.

4. **Pages 4.6-14 and 15, NOISE-6:** As no project construction activity is expected within a ¼-mile of an occupied dwelling, and because Applicant understands and will comply with Riverside County Ordinance 847 as summarized on Page 4.6-4, Applicant requests that NOISE-6 to be deleted in its entirety from the Conditions of Certification, as follows:

~~**NOISE-6** Heavy equipment operation and noisy construction work relating to any project features, including pile driving, within ¼-mile of a noise sensitive receptor shall be restricted to the times delineated below:~~

~~June through September: _____ 6 a.m. to 6 p.m.
October through May: _____ 7 a.m. to 6 p.m.~~

~~Concrete pouring during hot summer days may be performed outside the above hours, with the CPM approval.~~

NOISE AND VIBRATION

Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

Verification: Prior to ground disturbance, the project owner shall transmit to the CPM a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

At least 5 days prior to pouring of concrete outside of the above hours, the project owner shall submit a statement to the CPM, specifying the time of night and the number of nights for which concrete pouring will occur, and the approximate distance of this activity to the nearest noise-sensitive receptor.

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
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PUBLIC HEALTH

GENERAL COMMENTS

1. As noted in the overall general comments for the entire PSA, please correct the references to the two solar plants:

Rio Mesa SEGF I should be referenced as RMS -1
Rio Mesa SEGF II should be referenced as RMS-2

FINDINGS OF FACT

No findings of fact listed are listed in the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

No proposed Conditions of Certification are included in the PSA.

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
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SOCIOECONOMICS

GENERAL COMMENTS

1. Throughout the section, please replace reference to “project amendment” with “Applicant’s Environmental Enhancement Proposal.”

FINDINGS OF FACT

No findings of fact listed are listed in the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

Applicant does not propose any changes to the conditions of certification.

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
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WATER SUPPLY

GENERAL COMMENTS

1. The proposed Accounting Surface rule has been withdrawn and is not part of the Law of the River or any other enforceable regulation. It is not clear when, or even whether, it will be proposed again, and what changes would be incorporated if it is. As such, application of the proposed (and withdrawn) rule to the project evaluation is speculative. The Commission's Final Decision for Genesis Solar Energy Project, and the February 2, 2010 Decision and Scoping Order pursuant to the January 26, 2010 Hearing correctly concluded that the proposed Accounting Surface Rule is not an applicable LORS.¹ Thus under existing laws and regulations and consistent with the CECs' findings regarding other projects, the project's use of groundwater does not constitute a use of Colorado River water and does not require an entitlement.
2. Applicant was not provided a copy of the August 21, 2012 CEC memorandum titled "*Rio Mesa SEGF Groundwater Model Instability*" and cited in the PSA analysis until October 9, 2012. All of the questions and concerns raised in that memorandum were addressed during previous communications with Staff, though Staff continued to have questions regarding one issue related to "dry cell errors" encountered when they attempted to run the model. Included as Exhibit Water Supply-1 to this document is a Technical Memorandum that documents Applicant's response to each of the questions raised by CEC staff, and that addresses the "dry cell errors" encountered by CEC staff in a definitive manner using sensitivity analysis.
3. Staff's assertion that the RMS model is unreliable is unfounded as indicated by the Technical Memorandum included as Exhibit Water Supply-1. The RMS groundwater flow model was an adaptation of the AECOM model prepared for another project approved by the CEC (i.e., the Blythe Solar Power Plant [BSPP]) with specifically targeted changes to simulate RMS project pumping. Additional reasonable changes were made during construction of the model and during the model calibration process to improve the model's representation of the groundwater basin. CEC staff has raised questions regarding changes to the model's bottom elevations and asserts these changes have resulted in conditions that render the model unreliable. Changes were made to the model bottom elevations by the following process. The BSPP model bottom elevations were imported from the Blythe Solar Power Plant model, additional known data points for alluvium thickness from the Sun Desert project and other sources were added, and alluvium thickness was recalculated by subtracting the cell bottom elevations from elevations in the USGS Digital Elevation Model (DEM) for the area. The alluvium thickness was set to be zero where the bedrock outcrops, which is a reasonable adjustment and more realistically reflects the thinning and rising elevation of the aquifer near the basin edges. Finally, the hydraulic

¹ "The Commission's Final Decision for the Genesis Solar Energy Project, CEC-800-2010-011 CMF (September 2010), Section VI(B), Soil and Water Resources, pp. 12-13; See also February 2, 2010 Decision and Scoping Order pursuant to the January 26, 2010 Hearing, p. 3.

WATER SUPPLY

conductivity was changed in the RMS project area based on site-specific data from the Sun Desert project, and further reasonable adjustments were made during the model calibration process. These changes are consistent with the scope presented in Groundwater Impact Assessment included with the RMS AFC (Worley Parsons 2011b).

The conceptualization of aquifer geometry near the edges of basins is a common challenge in modeling. It can be difficult to geometrically model a thinning and sloping aquifer near the edges of a basin using a single layer model. In the case of the RMS model, improving the model geometry near the edges caused the simulated heads in many cells near the model's edges to fall below the base of the model. In the uppermost portions of the aquifer, the alluvial deposits may in fact be dry between significant recharge events, or flow could be occurring through highly heterogeneous deposits with relatively thin saturated zones. Nevertheless, the advent of dry cells and the challenges they can raise with model convergence in MODFLOW are well understood and long standing. The priority in dealing with this issue is not how to represent heads correctly, but how to make certain that the model is configured to deliver the appropriate amounts and rates of recharge to the portions of the model used for making the desired predictions. This remains the priority as long as the model areas of interest are located remote from these cells.

Several solutions may be used to simulate the appropriate recharge boundary condition in such instances and are valid as long as the recharge enters the model in the correct amounts. The approach used in the original RMS model was to model the cells as confined, which keeps them saturated and allows recharge to flow through them even if the heads fall below the base of the model. In such instances, the failure of the model to correctly predict heads in a subset of cells that are far removed from the area where model predictions are made is acceptable and does not affect the reliability of the model for its intended purpose. The model's reliability is validated if it meets the calibration criteria in the area for which predictions must be made and achieves a reasonable mass balance. In the case of the RMS model, the attached Technical Memorandum (Exhibit Water Supply-1) presents two separate approaches to this problem. The first is the approach taken by Worley Parsons originally, but with updates to the model to reflect other comments and questions received from CEC staff. In this case the aquifer cells were designated as confined to keep them saturated during the modeling process and allow them to deliver the requisite recharge. The fact that the model heads are below the base of the aquifer does not reflect the actual condition of the recharge areas, but nevertheless allows the model to correctly deliver recharge and maintain the correct mass balance. The second method consisted of lowering the bedrock surface as had been done by AECOM in the original BSPP model that was accepted by CEC. In this case the hydraulic gradient may be smaller than is actually the case and the aquifer thicker, but again recharge is delivered to the model in the correct amounts. Both methods yield similar results in terms of the predicted model drawdown and meet the model calibration and mass balance criteria. In addition, the predicted drawdowns are similar to those derived in the original model submitted with the AFC, and the updated model presented in the August 14, 2012 Technical Memorandum presented to CEC Staff. In all four cases, the models predict that drawdown impacts associated with the project will be less than significant. Applicant therefore concludes that CEC staff's assertion that the RMS model is unreliable is unfounded.

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4. In the PSA, staff presents an assessment of RMS project drawdown impacts using the USGS WTAQ modeling code. It is technically inappropriate to use the results of the WTAQ modeling in lieu of the more reliable and technical robust analysis derived from the calibrated MODFLOW model discussed in the attached Technical Memorandum. The analysis presented in this section should be replaced as summarized below. WTAQ is a simple, one-dimensional analytical model developed to analyze early time pump test drawdown data for the purpose of estimating aquifer properties (Barlow and Moench, 2011). It assumes that the aquifer is uniform, isotropic, of infinite aerial extent and constant in thickness. WTAQ does not allow for incorporation of boundary conditions, recharge, groundwater gradients, variations in aquifer thickness or variations in aquifer properties. Furthermore, as used by staff, the WTAQ model is not calibrated to verify its ability to predict long term drawdowns. The use of WTAQ to predict project impacts in lieu of a calibrated MODFLOW model is technically unsound, inappropriate and arbitrary. Modeling results presented in the attached Technical Memorandum (Exhibit Water Supply-1), derived from two different configurations of the RMS model that address CEC's concerns, yield similar results and indicate that drawdowns are over-predicted in the PSA by more than an order of magnitude. Based on the best available analysis, therefore, drawdown impacts are projected to be less than significant. In the specific comments below, Applicant points out several examples, but not all instances, of changes conforming to this comment.

5. The analysis of groundwater use and impacts incompletely characterizes regional groundwater conditions and consequently overstates the extent to which Project water use could have any impact, let alone a significant impact, to adjacent wells, vegetation, the aquifer, and to the Colorado River. The analysis does not include, and must incorporate, the following facts and conclusions:
 - (a) The Palo Verde Mesa Groundwater Basin (PVMGB) and the Palo Verde Valley Groundwater Basin (PVVGB) located to the east of the PVMGB are fundamentally characterized by surplus recharge related to agricultural irrigation that has historically increased groundwater levels and has created a groundwater mound between the Colorado River and locations to the west (AFC Appendix 15.5D, page 4).
 - (b) The rising groundwater levels and groundwater mounding that is characteristic of the PVMGB and PVVGB threaten crop roots and chronic surface saturation. In response, the Palo Verde Irrigation District (PVID) has constructed a network of deep drains within the PVVGB to convey surplus groundwater to the Colorado River (AFC Appendix 15.5D, page 4).
 - (c) The groundwater budget, or supply and demand balance, for the PVMGB and PVVGB includes approximately 424,600 acre-feet per year. Of that amount, approximately 357,000 acre-feet per year, or 84.1% is surplus groundwater discharged to the Colorado River through the PVID drains (AFC Appendix 15.5D, Table 2-1).
 - (d) Project construction-period consumption of 405 acre-feet per year would amount to approximately 0.095% of the total annual PVMGB-PVVGB groundwater budget, and 0.11% of the portion of the annual water budget that is comprised of surplus groundwater annually discharged through the PVID drain system. Project operational-period consumption of approximately 173 acre-feet per year would amount to approximately 0.041% of the total annual PVMGB-PVVGB groundwater budget, and 0.048% of the portion of the annual water budget that is comprised of surplus groundwater annually discharged through the PVID drain system.

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- (e) On a project basis, and compared to total energy output, the Project would use substantially less construction-period and operational groundwater than other recently-approved thermal solar projects, and more than 94% less water than the gas-fired Blythe Energy Project I (estimated in PSA Table 8 to use 3,000 acre-feet per year for 520 megawatts of electrical capacity, compared with Project consumption of 173 acre-feet per year for 500 megawatts of electrical capacity).
 - (f) Project construction-period and operational groundwater use cannot reasonably be determined to affect regional groundwater levels, adjacent groundwater wells, or any other groundwater-related beneficial use under conditions in which 84% of the regional groundwater supply, or approximately 357,000 acre-feet per year, must be discharged from the basin to protect plant roots and to avoid chronic surface saturation. Project construction use of approximately 0.11% and operational use of approximately 0.048% of this surplus groundwater would have no impact to regional groundwater conditions. The amount of surplus groundwater discharged annually from the regional groundwater system will remain functionally identical with or without Project-related groundwater use, and this surplus will continue to support and maintain groundwater conditions at existing levels throughout the PVMGB and PVVGB.
 - (g) Project pumping cannot affect flow in the Colorado River because the groundwater mound beneath the PVID irrigated lands creates a hydraulic barrier. The extent to which Project groundwater consumption may affect flow in the PVID drains at the foot of the mesa is uncertain, and in any event less than the project's pumping rates. PVID's margin of error in reporting drain return flow to the Colorado River is +/-50,000 AFY; therefore, the project's impact on drain flow would not be measureable or observable.
6. Groundwater consumption by the Project cannot reasonably be expected to affect local vegetation for several reasons:
- (a) Existing groundwater levels under the project site vary from at least 140 to 160 feet below ground surface, and that the water table is approximately 200 feet or lower than ground surface along an east-to-west geologic cross section running through the approximate center of the project (AFC Appendix 15.5D, page 4 and Figures 2-1 and 2-2).
 - (b) In June 2012, Applicant submitted an Environmental Enhancement Proposal that reduced the number of proposed solar facilities from three to two, and reduced operational water consumption by approximately 33% (from 260 acre-feet per year to 173 acre-feet per year) (Supplemental Response to DR Set 1A (#16 and #26), page 5.15-8). Potential drawdowns that could be associated with Project groundwater use were recalibrated to reflect this lower level of consumption. The results, which reflect conservative assumptions regarding such factors as the continuing influence of surplus groundwater conditions and easterly groundwater mound on local groundwater levels, show that the drawdown would be almost entirely limited to the Project site and would range from about 1.2 feet in the immediate vicinity of the wells to 0.2 feet at the farthest contour (Supplemental Response to DR Set 1A (#16 and #26), Figure 5.15-11 REV). The level of drawdown in almost all locations is within the range of naturally occurring background fluctuations (Supplemental Response to DR Set 1A (#16 and #26), Page 5.15-12).
 - (c) Desert vegetation root depths have been documented to average approximately 9.5 meters (31.2 feet) with a range of 2.4 meters (7.9 feet)(see e.g., J. Canadell, et al., *Maximum*

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- rooting depth of vegetation types at the global scale*, *Oecologia*, Volume 108, Number 4 (1996), 583-595). Certain desert species may have deeper roots, such as mesquite trees, but larger mesquite trees are not present within the site and smaller mesquite plants occur only sporadically in surrounding areas. According to the Arizona-Sonora Desert Museum, no desert plant is known to use very deep roots as a primary strategy for survival. The root systems of most trees—including mesquites—are mostly confined to the upper three feet of soil. Few rains penetrate deeper than this, and at greater depths there is little oxygen to support root respiration (http://www.desertmuseum.org/books/nhsd_plant_ecology.php).
- (d) The seepweed wetland habitat located just below the mesa, east of the project fence line, is supported by surface flows from a large dry wash from the west (Revised Rio Mesa Preliminary Jurisdictional Report (October 2012), 8). Groundwater levels beneath the seepweed habitat are controlled by the PVID drain.
- (e) While the PSA speculates that there may be an as-yet undetected linkage between onsite vegetation and a water table that is substantially lower than desert vegetation root depths, there is no scientific evidence in the record that could possibly support any such determination. The PSA analysis must be revised to reflect the following facts. Groundwater levels within the site range from a minimum of 140-160 feet below ground surface, substantially (nearly 100 feet) below the maximum root depth of desert plant species. Desert plants are subject to significant natural annual rainfall, surface water flow and groundwater variability. The range of groundwater drawdowns associated with Project pumping under conservative assumptions is, in almost all locations in the site, within the range of naturally-occurring background fluctuations and within or below the range of naturally-occurring background fluctuations in all offsite locations. As a result, vegetation located within and in the region of the Project could not reasonably be determined to be affected by the extremely minor groundwater level variability that could be associated with the Project over time. CEC staff performed an alternative groundwater analysis using a model that the PSA acknowledges is inaccurate and incomplete (see General Comment 4). The level of hypothetical drawdowns identified by the incomplete staff analysis, however, would still not affect vegetation located within and in the region of the project due to the existing depth to groundwater. Furthermore, if perched groundwater is located below the microphyll woodlands in the washes at the site as suggested in the PSA, it is by definition hydraulically separated from the underlying aquifer used for project pumping and physically incapable of experiencing drawdown as a result of project pumping.
- (f) Irrespective of the groundwater model results, the fundamental characteristic of the regional groundwater basin is that approximately 84%, or 357,000 acre-feet per year of the PVMGB and the PVVGB annual groundwater budget is discharged from the basin to avoid surface saturation. Under this condition, the withdrawal of 173 acre-feet per year for project use, and approximately 405 acre-feet per year during construction, cannot reasonably be determined under any hydrodynamic theory to cause measurable changes in groundwater levels near the edge of the mesa that are maintained at their current levels by installation of the drains. Thus, the relatively small amount of pumping will not be able to impact surface vegetation east of the mesa.

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7. Project pumping from the PVMGB will not significantly affect, or contribute to significant cumulative effects on, nearby wells (see Specific Comments 1, 20, 36), the PVMGB balance (see General Comment 5, Specific Comments 6, 9, 10, 21, 39), or sensitive vegetation communities (see General Comment 6, Specific Comments 3, 25, 38). While some of the groundwater pumped by the project pumping could reduce the amount of surplus PVMGB groundwater discharged to the PVID drains, the impact of reduced discharge from PVID drains to the Colorado River is virtually immeasurable and cannot be considered to be a significant impact, individually or cumulatively, to Colorado River water users (see General Comment 5, Specific Comments 4, 6, 9, 10, 21, 31, 39). Furthermore, the project's use of PVMGB groundwater does not constitute a consumptive use of Colorado River water requiring an entitlement to divert from the River (see General Comment 1, Specific Comments 7, 11, 31, 33). No mitigation is required or reasonable given the hydrological context of the groundwater basin that could be affected by the Project, the virtually immeasurable extent of Project consumption relative to the basin's surplus annual water budget, and the virtually immeasurable extent of Project consumption relative to the annual amount of surplus groundwater discharged from the basins through the PVID drainage system. Nevertheless, Applicant will voluntarily agree to offset all project groundwater pumping by conserving water within the Colorado River Basin or PVMGB, as discussed in the proposed changes to Condition of Certification WATER SUPPLY-6. Conservation measures may include water conservation technologies, invasive plant removal, crop modifications, acquiring water or water rights, or other measures that will generate an equivalent amount of water in the Colorado River Basin or PVMGB.

~~ADDITIONAL INFORMATION STAFF REQUIRES FROM THE APPLICANT IN ORDER TO COMPLETE THE FSA~~

~~The applicant is required to submit a detailed description of how the applicant would mitigate Colorado River take and define the water conservation method, quantify the conservation amounts, and analyze how the conservation projects mitigate the impacts of the proposed project.~~

FINDINGS OF FACT

No findings of fact listed are in this section of the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

1. **Page 4.9-37:** Please revise **Water Supply-1** as follows:

WATER SUPPLY-1: Groundwater use for all construction activity shall not exceed 405 acre-feet per year (AF/y). Groundwater use for operation of both power plants and drinking and sanitation water shall not exceed 173 AF/y. The quantity of the groundwater used annually for project construction and operation shall be reported annually to the compliance project manager (CPM) to ensure compliance with this condition.

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 (gpd) the total volume(s) of water supplied to the project from this water

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source. The metering devices shall be operational for the life of the project and shall be calibrated and maintained in accordance with the manufacturers recommended methods and schedule.

The project owner shall report all groundwater produced to the State Water Resource Control Board (SWRCB) pursuant to the requirement of Water Code Section 4999 et. seq.

Verification: ~~At least sixty (60) days prior~~ At least sixty (60) days prior to the start of ~~construction~~ groundwater pumping of the proposed project, the project owner shall submit to the CPM a copy of evidence that metering devices have been installed and are operational. Beginning six (6) months after the start of groundwater usage for construction, the project owner shall prepare a semi-annual summary report of the amount of water used for construction purposes. The summary shall include the monthly range and monthly average of daily water usage in gpd. After the start of commercial operation, project owner shall prepare an annual summary report, which will include maximum ~~daily and~~ monthly usage in gpd and the total monthly and annual usage in acre-feet. Following the first year of commercial operation, the annual summary report will summarize the annual usage in tabular form. For calculating the total water use, the term "year" will correspond to the date established for the Annual Compliance Report (ACR). The project owner shall file an annual Notice of Extraction and Diversion of Water with the SWRCB or the local agency designated to oversee the Groundwater Recordation Program in accordance with Water Code Section 4999 et. seq. The project owner shall include a copy of the filing in the ACR.

2. **Page 4.9-38:** Please revise **Water Supply-2** as follows:

WATER SUPPLY-2: The project owner shall construct and operate ~~three or more one~~ three or more one onsite production groundwater wells and ~~one~~ one backup wells. The project owner shall ensure that these wells are completed in accordance with all applicable state and local groundwater well requirements. The project owner shall do all of the following before beginning any project fencing or grading activity:

- a. Well Installation Packet. Submit a groundwater well installation packet to the County of Riverside for review and comment and the CPM for review and approval. This packet shall contain documentation, plans, and fees normally required for a County well installation permit.
- b. Well Completion Report. In accordance with California's Water Code section 13754, the project owner shall ensure that the well driller submits to the California Department of Water Resources a Well Completion Report for each well installed. A copy of the Well Completion Report shall also be submitted to the CPM.

The project shall not construct a groundwater well until the CPM provides approval to construct or operate a groundwater well.

Verification: The project owner shall submit all of the following:

1. A groundwater well installation packet shall be submitted to the County of Riverside for review and comment and the CPM for review and approval at least ninety (90)

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days before groundwater pumping begins, or such time as agreed upon by the Project Owner and the CPM.

2. A Well Completion Report for each groundwater well shall be submitted no later than thirty (30) days after installation of the groundwater well, or such time as agreed upon by the Project Owner and the CPM.
3. **Page 4.9-38:** Please revise the first sentence of **Water Supply-3** as follows:

WATER SUPPLY-3: To the extent the project uses groundwater for potable purposes,
~~t~~The project is subject to the requirements of California Code of Regulations title 22, Sections 64400.80 through 64445 for a non-transient, non-community water system (serving 25 people or more for more than six months).

4. **Page 4.9-39:** Please revise the first sentence of **Water Supply-4** as follows:

WATER SUPPLY-4: Prior to the start of any groundwater pumping, the project owner shall submit the following ~~for CPM review and approval:~~

- a. A Groundwater Well Reconnaissance Report. This report shall identify all groundwater wells within a five-mile radius of the project production wells. The methodology used and results of this well reconnaissance shall be described in detail in a written report.
- b. A Groundwater Monitoring and Reporting Plan. This plan shall describe the methodology and the network of wells to be used to monitor groundwater elevation and quality. This network of wells shall require installation of ~~at least two new groundwater monitoring wells between the project production wells and sensitive woodland vegetation and two monitoring wells between the project production wells and the PVID drains sensitive mesquite vegetation.~~ These wells shall be monitored to evaluate potential groundwater impacts. At least three wells shall be used to monitor groundwater quality for evaporation pond leak detection monitoring. New monitoring wells dedicated to evaporation pond leak detection may be required.
- c. A Baseline Groundwater Monitoring Report. The report shall establish baseline groundwater elevation and quality conditions using the above groundwater monitoring well network ~~within a five-mile radius of the project production wells.~~

A meeting(s) with the CPM is required prior to the submittal of each item above to ensure that the correct information is included in the submittal. This required information will be documented by the CPM. If the project owner fails to provide the required information, this condition of certification is not satisfied.

Beginning six months after groundwater pumping commences, and semi-annually thereafter for the next five years, the project owner shall submit the following to the CPM ~~for review and approval:~~

- d. A Groundwater Monitoring Report. This report shall document current groundwater elevation and quality conditions. These current conditions

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shall, in detail, be quantitatively compared to the baseline conditions. All significant impacts shall be documented and mitigated in accordance with Conditions of Certification **WATER SUPPLY-5** and ~~6~~ and **BIO-8**.

Every five years, the project owner shall evaluate the data and provide a detailed written analysis of whether the monitoring, reporting, and mitigation program frequency should be revised or eliminated.

Verification: The project owner shall submit all of the following. Failure to follow this schedule may result in project construction delays.

1. A Groundwater Well Reconnaissance Report shall be submitted at least six (6) months before groundwater pumping begins, or such time as agreed upon by the Project Owner and the CPM.
2. A Groundwater Monitoring and Reporting Plan shall be submitted at least ninety (90) days before groundwater pumping begins, or such time as agreed upon by the Project Owner and the CPM.
3. A Baseline Groundwater Monitoring Report shall be submitted at least thirty (30) days before groundwater pumping begins, or such time as agreed upon by the Project Owner and the CPM.
4. A Groundwater Monitoring Report shall be submitted every six (6) months beginning six (6) months after groundwater pumping begins, or such time as agreed upon by the Project Owner and the CPM.

5. **Page 4.9-40:** Please revise the first sentence of **Water Supply-5** as follows:

WATER SUPPLY-5: This program will be triggered if groundwater drawdown of 5 feet² or more outside of the project site attributable to project pumping is observed or projected based on data from the groundwater monitoring program described in WATER SUPPLY-4. The type and extent of mitigation shall be determined by the amount of water level decline induced by the project pumping, the type of impact, and site-specific well construction and water use characteristics. If an impact is determined to be caused by drawdown from more than one source, the level of mitigation provided shall be proportional to the amount of drawdown induced by the project relative to other sources.

In order to be eligible, a well owner must provide documentation of the well location and construction, including pump intake depth, and evidence that the well was constructed and in use before project pumping was initiated. The mitigation of impacts shall be determined as follows:

- a. Increased Electrical Usage. If project pumping has lowered a well's water levels by five feet or more and increased pumping lifts, increased energy costs shall be calculated. Payment or reimbursement for the increased costs

² CEC Final Decision, Genesis Solar Energy Project, Condition of Certification Soil&Water-2.

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shall be provided at the option of the affected well owner. In the absence of specific electrical use data supplied by the well owner, the following formula shall be used to calculate the additional electrical usage:

$$\text{Increased Cost for Energy} = (\text{change in lift/total hydraulic head}) \times (\text{total energy consumption times costs/unit of energy})$$

Where:

change in lift (ft) = calculated change in water level in the well

total hydraulic head (ft) = (elevation head) + (discharge pressure head)

elevation head (ft) = (wellhead discharge pressure gauge elevation)
– (water level elevation in well during pumping)

discharge pressure head (ft) = (pressure in pounds per square inch at wellhead discharge gauge) x (2.31 to convert psi to feet of water)

The project owner shall submit to the CPM for review and approval the documentation showing which well owners must be compensated for increased energy costs and that the proposed amount is sufficient compensation to comply with the provisions of this condition.

- i. Any reimbursements (either lump sum or annual) to impacted well owners shall be only to those well owners whose wells were in service within six months of the Commission Decision.
- ii. The project owner shall notify all owners of the impacted wells within one month of the CPM approval of the compensation analysis for increased energy costs.
- iii. The project owner shall provide compensation either on a one-time lump-sum basis or on an annual basis, as described below.

Annual Compensation. Compensation provided on an annual basis shall be calculated prospectively for each year by estimating energy costs that will be incurred to provide the additional lift required as a result of the project. With the permission of the impacted well owner, the project owner shall provide energy meters for each well or well field affected by the project. The impacted well owner to receive compensation must provide documentation of energy consumption in the form of meter readings or other verification of fuel consumption. For each year after the first year of operation, the project owner shall include an adjustment for any deviations between projected and actual energy costs for the previous calendar year.

One-Time Lump-Sum Compensation. Compensation provided on a one-time lump-sum basis shall be based on a well-interference analysis, assuming the maximum project-pumping rate of 173 AF/y. Compensation associated with increased pumping lift for the life of the project shall be estimated as a lump sum payment as follows:

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- i. The current cost of energy to the affected party considering time of use or tiers of energy cost applicable to the party's billing of electricity from the utility providing electric service, or a reasonable equivalent if the party independently generates their electricity;
 - ii. An annual inflation factor for energy cost of 3 percent; and
 - iii. A net present value determination assuming a term of 25 years and a discount rate of 9 percent;
- b. **Well Screen Exposure.** If groundwater monitoring data indicate project pumping has lowered water levels below the top of the well screen, and the well yield is shown to no longer meet pre-project demand, compensation shall be provided to diagnose and treat well screen encrustation. Reimbursement shall be provided at an amount equal to the customary local cost of performing the necessary diagnosis and maintenance for well screen encrustation. Should well yield reductions be reoccurring, the project owner shall provide payment or reimbursement for either periodic maintenance throughout the life of the project or replacement of the well.
- c. **Well Yield.** If project pumping has lowered water levels to significantly impact well yield so that the well can no longer meet its intended purpose, causes the well to go dry, or causes casing collapse, payment or reimbursement of an amount equal to the cost of deepening or replacing the well shall be provided to mitigate these effects. Payment or reimbursement shall be at an amount equal to the customary local cost of deepening the existing well or constructing a new well of comparable design and yield (only deeper). The demand for water, which determines the required well yield, shall be determined on a per well basis using well owner interviews and field verification of property conditions and water requirements compiled as part of the pre-project well reconnaissance. Well yield shall be considered significantly impacted if it is incapable of meeting 1150 percent of the well owner's maximum daily demand, dry-season demand, and annual demand – assuming the pre-project well yield documented by the initial well reconnaissance met or exceeded these yield levels. The contribution of project pumping to observed decreases in observed well yield shall be determined by interpretation of the groundwater monitoring data collected and shall take into consideration the effect of other nearby pumping wells, basin-wide trends, and the condition of the well prior to the commencement of project pumping.
- d. The project owner shall notify any owners of the impacted wells within one month of the CPM approval of the compensation analysis.
- e. **Pump Lowering.** In the event that groundwater is lowered as a result of project pumping to an extent where pumps are exposed but well screens remain submerged, the pumps shall be lowered to maintain production in the well. The project shall reimburse the impacted well owner for the costs associated with lowering pumps in proportion to the project's contribution to the lowering of the groundwater table that resulted in the impact.

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- f. Deepening of Wells. If the groundwater is lowered enough as a result of project pumping that well screens and/or pump intakes are exposed, and pump lowering is not an option, such affected wells shall be deepened or replacement wells constructed. The project shall reimburse the impacted well owner for all costs associated with deepening existing wells or constructing replacement wells in proportion to the project's contribution to the lowering of the water table that resulted in the impact.

Verification: The project owner shall do all of the following:

- ~~1.~~ At least sixty (60) days prior to project construction, the project owner shall submit to the CPM, for review and approval, a comprehensive plan (Groundwater Level Monitoring and Reporting Plan) presenting all the data and information required in Item A above. The project owner shall submit to the CPM all calculations and assumptions made in development of the plan.
- ~~2.~~ During project construction, the project owner shall submit to the CPM quarterly reports presenting all the data and information required in Item B above. The project owner shall submit to the CPM all calculations and assumptions made in development of the report data and interpretations.
- ~~1.3.~~ No later than sixty (60) days after commencing project operation, or such time as agreed upon by the Project Owner and the CPM, the project owner shall provide to the CPM, for review and approval, documentation showing that any mitigation to private well owners during project construction was satisfied, based on the requirements of the property owner as determined by the CPM.
- ~~4.~~ During project operation, the project owner shall submit to the CPM, applicable quarterly, semi-annual, and annual reports presenting all the data and information required in Item C above. The project owner shall submit to the CPM all calculations and assumptions made in development of report data and interpretations, calculations, and assumptions used in development of any reports.
- ~~2.5.~~ The project owner shall provide mitigation as described in ~~Item D~~ above, if the CPM's inspection of the monitoring information confirms project-induced changes to water levels and water level trends relative to measured pre-project water levels, and well yield has been lowered by project pumping. The type and extent of mitigation shall be determined by the amount of water level decline and site-specific well construction and water use characteristics. The mitigation of impacts shall be determined as set forth in ~~Item D~~ above.
- ~~3.6.~~ No later than 30 days after CPM approval of the well drawdown analysis, or such time as agreed upon by the Project Owner and the CPM, the project owner shall submit to the CPM all documentation and calculations describing necessary compensation for energy costs associated with additional lift requirements.
- ~~4.7.~~ The project owner shall submit to the CPM all calculations, along with any letters signed by the well owners indicating agreement with the calculations, and the name and phone numbers of those well owners that do not agree with the calculations.
- ~~5.8.~~ If mitigation includes monetary compensation, the project owner shall provide documentation to the CPM that compensation payments have been made by March 31 of each year of project operation or, if a lump-sum payment is made, payment

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shall be made by March 31 of the following year. Within 30 days after compensation is paid, or such time as agreed upon by the Project Owner and the CPM, the project owner shall submit to the CPM a compliance report describing compensation for increased energy costs necessary to comply with the provisions of this condition.

6. **Page 4.9-44:** Please revise the first sentence of **Water Supply-6** as follows:

Colorado River IMPACT MITIGATION CONSERVATION TO OFFSET GROUNDWATER USAGE

WATER SUPPLY-6: The project owner shall undertake one or more of the activities identified below to offset project groundwater pumping and mitigate potential project impacts to flows in the PVID drain at the foot of Palo Verde Mesa and in the Colorado River. These activities shall result in replacement of up to 5,506 acre-feet (AF) (up to 405 AF/y during construction and 173 AF/y during 25 years of operation) of water in the Colorado River Basin or the PVMGB over the life of the project. The activities ~~may shall~~ include water conservation projects such as payment to MWD for replacement of SWP water for Colorado River water, payment for irrigation improvements in Palo Verde Irrigation District, purchase of water rights within the Colorado River Basin or PVMGB that will be held in reserve, tamarisk eradication, purchase of water from the City of Needles Water Bank, Project Owner participation in agricultural land fallowing, or other proposed ~~mitigation~~ conservation activities acceptable to the CPM. The activities proposed for ~~mitigation~~ conservation shall be described in detail in a Water Conservation ~~Supply~~ Plan that shall be provided to the CPM for review and approval. The Water Conservation Plan shall include the following at a minimum:

- a. Identification of the activities and water source that will replace up to 5,506 AF of diverted water within from the Colorado River Basin or the PVMGB over the life of the project;
- b. Demonstration of the project owner's legal right to the water or ability to conduct the activity and all written agreements demonstrating that right;
- c. Discussion of whether any governmental approval of the identified activities will be needed and compliance with CEQA;
- d. Copies of all correspondence with any local, state, or federal government entities that discuss conditions for approval of the activities and water source that will replace up to 5,506 AF of ~~diverted~~ water from the Colorado River Basin or PVMGB.
- e. Demonstration of how much Colorado River Basin or PVMGB water each of the chosen activities replaces;
- f. An estimated schedule for completion of the activities;
- g. Performance measures that would be used to evaluate the amount of water replaced by the activities; and
- h. A Monitoring and Reporting Plan describing in detail the steps necessary and proposed frequency of reporting to show the activities are achieving

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the intended benefits and replacing the Colorado River Basin or PVMGB water diversions.

Verification: The project owner shall submit a Water Conservation Plan to the CPM for review and approval thirty (30) days before the start of extraction of groundwater for construction, or such time as agreed upon by the Project Owner and the CPM.

7. **Page 4.9-45:** Please revise the first sentence of **Water Supply-7** as follows:

WATER SUPPLY-7: Prior to the start of commercial operation the project owner shall protect groundwater resources by abandoning ~~all~~ groundwater wells existing on the proposed project property that are not proposed for use by the Project Owner for water supply, standby or monitoring use. Abandonment procedures shall be developed consistent with those described in the California Department of Water Resources Bulletins 74-81 & 74-90. The owner shall submit a well abandonment packet and applicable fees to the County of Riverside, for review and comment. The owner shall also submit to the CPM the well abandonment packet containing the County of Riverside's comments and proof of County fee payment. The project shall not abandon a well until the CPM provides approval. In accordance with California's Water Code section 13754, the project owner shall ensure that the well driller submits to the California Department of Water Resources a Well Completion Report for each well abandoned. Once wells have been abandoned in accordance with the approved plan the project owner shall file well completion reports for each abandoned well with Riverside County, California Department of Water Resources, and the CPM.

Prior to commencement of commercial operation, the project owner shall provide a report to the CPM that documents the actual location, conditions, methods and materials used to complete abandonment of each well and confirmation that the ~~all~~ wells ~~within the project property~~ have been abandoned consistent with the requirements of this condition.

Verification: No later than thirty (30) days before well abandonment, or such time as agreed upon by the Project Owner and the CPM, the project owner shall submit copies of the well packets with review and comment from Riverside County to the CPM for review and approval.

No later than thirty (30) days prior to commencement of commercial operation, or such time as agreed upon by the Project Owner and the CPM, the project owner shall provide a report to the CPM that a copy of the Well Completion Report for each well abandoned and documents that show the actual location, conditions, methods, and materials used to complete abandonment of each well and a statement that the ~~all~~ wells ~~within the project property~~ have been abandoned.

Appendix Water Supply 1



DATE	17 October 2012
TO	TECHNICAL MEMORANDUM
FROM	Mark Trudell, Ph.D., PG, CHG
COPY	Michael Rojansky
PROJECT NAME	BrightSource Rio Mesa Impact Assessment Modeling
PROJECT NO.	
SUBJECT	Updated Groundwater Resource Impact Modeling
FILE LOC.	

TECHNICAL MEMORANDUM

Background

This technical memorandum addresses certain questions raised by California Energy Commission (CEC) water staff regarding the groundwater flow and impact analysis provided in the Application for Certification (AFC) for the Rio Mesa Solar (RMS) project in 2011. The questions were included in an internal CEC memorandum dated August 21, 2012 that was referenced in the CEC's Preliminary Staff Assessment (PSA) for the Rio Mesa Solar Electrical Energy Facility (RMS) that was publicly released on September 28, 2012. The August 21, 2012 internal memorandum was provided to WorleyParsons via email on October 9, 2012.

The consultation history between the RMS project consultants and CEC staff regarding water issues includes the following:

- CEC initially submitted a written list of questions regarding the model after an RMS workshop on May 24, 2012.
- Responses to the CEC's questions were provided via email on June 13, 2012 and are included as **Attachment A**. These responses addressed each of the questions contained in the written list of questions received on May 24. The responses also address the issues subsequently discussed in the August 21 internal memorandum.
- The May 24 questions and June 13 responses were discussed with CEC staff during a teleconference on June 28, 2012.
- After the call, additional information was provided to CEC in a Technical Memorandum dated August 14, 2012, which is included as **Attachment B**. The August 14 memorandum



presented an updated impact assessment that revised the project pumping location and the 33% reduction in project water demand associated with the elimination of RMS unit 3 from the project proposal. Based on comments from CEC staff, the model also included a refined recharge distribution and the memorandum provided a discussion of calibration statistics and error messages regarding dry cells encountered when CEC attempted to run the model.

- The August 14 Technical Memorandum was further discussed with CEC at a meeting on August 16, 2012 during which the model was demonstrated to CEC staff.
- A subsequent teleconference occurred on August 20 to discuss the dry cell error concerns raised by CEC staff.

The updated model presented in the August 14 Technical Memorandum concluded that the project's impacts on groundwater resources would be negligible, particularly with the reduced demand associated with the revised two-facility proposal. Maximum predicted drawdowns were 4 feet at the end of project pumping in the immediate vicinity of the well. Drawdown was predicted to be limited to the Palo Verde Mesa Groundwater Basin and did not extend into the Palo Verde Valley Groundwater Basin. The maximum predicted drawdown at simulated monitoring well MW-4, located near the Palo Verde Irrigation District (PVID) drain at the foot of the mesa, was 0.05 foot. Calibration statistics met all of the calibration goals. These results were similar to, but slightly less than, the predicted results using the original model presented in the *Groundwater Impact Assessment Report* (WorleyParsons, 2011), which included demand associated with three, rather than two solar facilities as currently proposed.

The purpose of this Technical Memorandum is to provide additional information in response to CEC water staff's concerns, as expressed in the PSA, that the groundwater model used to analyze potential project impacts may be unreliable. The primary rationale for this conclusion appears to be that, when CEC staff ran the model using the GMS® modeling platform, certain "dry cell" errors occurred.

This memorandum discusses the procedure used to build and refine the RMS model from the original AECOM groundwater model that was developed for the Blythe Solar Power Project (BSPP), a model that was accepted by the CEC during the review and eventual certification of the BSPP. The discussion focuses on modifications that were made to the model Layer 1 top and bottom cell elevations to reflect conditions applicable to the project site. This memorandum then explains why "dry cell errors" were encountered by the CEC and why this result does not affect the model's reliability and RMS project impact predictions. Finally, a sensitivity analysis is included using two versions of the model updated to reflect all of the CEC water staff's comments to demonstrate that the dry cell errors identified in the PSA do not affect the drawdown predictions. Figure 1 is a site plan that includes the location of the wells referenced in this memorandum.

Model Construction

As discussed in the August 14, 2012 memorandum (WorleyParsons, 2012) and in the *Groundwater Impact Assessment Report* (WorleyParsons, 2011), the RMS groundwater model was based on a MODFLOW 2000 model prepared by AECOM for the Blythe Solar Power Project (BSPP) and accepted by the CEC for BSPP review and certification purposes (AECOM, 2010). The AECOM model was originally created using the GMS® modeling platform. WorleyParsons used the MODFLOW 2000 files created by AECOM to generate a model for RMS using the Groundwater Vistas® platform. The



following summarizes changes made to the AECOM model by WorleyParsons to reflect RMS site conditions:

1. The thickness of the alluvial deposits (bottom elevation and ground surface elevation) was revised to reflect known ground surface elevations and geologic principals (zero thickness at the bedrock outcrop) and updated with additional geologic data;
2. Hydraulic conductivity values were adjusted to reflect data near the project site and adjusted during model calibration;
3. Mountain front recharge for the Mule Mountains and Palo Verde Mountains, (in the southern part of the Palo Verde Mesa Groundwater Basin, near the RMS project) was added as uniform recharge flux applied to all mountain front recharge cells to achieve the total mountain front recharge of 5,300 AFY identified in the water balance analysis for the Basin (*Groundwater Characterization Report, WorleyParsons 2010*); and
4. The model grid was refined in the vicinity of the RMS project wells.

Apart from these adjustments, no other modifications were made to the AECOM model. No errors were encountered in the process of converting from the GMS model platform to the Groundwater Vistas® platform. No errors were encountered when the model was run on the Groundwater Vistas® platform to generate steady state and transient predictive scenarios for RMS. After WorleyParsons completed the development and testing of the model, the RMS modeling files were provided to the CEC. The version of the model included with the August 14, 2012 Technical Memorandum included a refinement of mountain front recharge rate variability related to precipitation for each mountain range, and the RMS pumping rate and well locations were updated to reflect the revised, two-facility proposal.

Changes to the AECOM Model Layer 1 (Alluvium) Bottom and Top Elevations

As described in the 2011 Groundwater Impact Assessment Report, WorleyParsons updated the base of alluvium elevation and alluvium thickness in the RMS model to incorporate new geologic data. In particular, the AECOM model was adjusted to more accurately represent the bottom elevation and thickness of alluvium in the mountain front area. These revisions reflected the following, documented inaccuracies in the AECOM model:

1. The base of alluvium elevation over the western approximately one-quarter of the AECOM model domain was a uniform -200 ft mean sea level (msl), despite the fact that ground elevations in the mountain front area of the model domain in places exceed 1000 ft msl to 1200 ft msl. This elevation parameter inaccurately characterized alluvium in the mountain front areas as having an extraordinary depth extending for several hundreds of feet, a result that was not justified by the well established geology of the region. .
2. After the AECOM MODFLOW 2000 model was imported into the Groundwater Vistas platform, the model Layer 1 top elevation (which should correspond to ground surface elevation) was noted to be a uniform 600 ft msl over the entire model domain. This was clearly an inaccurate characterization, and possibly was an artifact of the model import process. If uncorrected, a uniform 600 ft msl Layer 1 top elevation would have generated an assumed alluvium thickness



(model Layer 1) of 800 feet over the entire western one-quarter of the model domain, including mountain front outcrop areas where no alluvium would be present.

To incorporate more refined geologic data about the model area, WorleyParsons implemented the following modifications to the AECOM model:

1. Initiated the analysis on the basis of Figure 8 in the AECOM (2010) model report, which identifies the alluvium base elevation (although the figure caption says “isopach”) with approximate and inferred contours;
2. Converted the contour lines (approximate and inferred) from Figure 8 to GIS polylines with appropriate alluvium bottom elevation attributes;
3. Extended the polylines, where appropriate, to the edge of the Palo Verde Mesa Groundwater Basin, following the implied direction and curvature of the polylines;
4. Converted the polylines to equidistant station points along polylines;
5. Incorporated historical well log data (in three dimensions, X,Y,Z) from 14 Rio Mesa area wells (Stone and Webster, 1976) into alluvium bottom elevation “station points” and created a gridded dataset file;
6. Clipped the output gridded dataset file to correspond with the Palo Verde Mesa Groundwater Basin and Palo Verde Valley Groundwater Basin boundaries; and
7. Imported the alluvial base elevation gridded dataset file (in three dimensions, X,Y,Z) into the Groundwater Vistas® model as bottom elevation, Layer 1 in the model.

As a final step, ground surface topography from the USGS 1/3 arc second grid file (10 meter grid cells) was imported into the model as a gridded dataset file (in three dimensions, X,Y,Z) for the top of Layer 1. A minimum Layer 1 cell thickness of two feet was specified by adjusting the Layer 1 bottom elevation where needed.

The alluvium (Layer 1) characteristics resulting from these adjustments comprise a more realistic and defensible geologic representation of alluvium bottom elevation and thickness than in the original AECOM model. As corrected, the model accurately identifies an alluvium thickness of zero where bedrock outcrops along the basin boundaries (which coincide with model domain boundaries), whereas thick alluvium was attributed to these areas in the AECOM model. The ground surface elevation over the model domain was also corrected to vary from approximately 200 feet msl to over 1200 feet msl in accordance with actual topography from the USGS digital elevation model (DEM).

Dry Cell Error Messages

As CEC staff observed, the simulated hydraulic heads along much of the mountain front areas are below the bottom of the alluvium model layer. This results from steep bedrock topography combined with thin alluvial deposits and relatively shallow hydraulic gradients in the alluvial aquifer approaching the recharge zones. Modeling aquifer geometry near the edges of a groundwater basin is frequently challenging. It can be difficult to geometrically model a thinning and sloping aquifer near the edges of a basin using a single layer model. In the RMS model, improving model geometry near the basin edges



as described above appears to have caused the simulated heads in many cells near the model's edges to be below the base of the model layer. Edge effects of this nature are not an uncommon groundwater model result where drainage basin boundaries occur in areas of elevated topography. Groundwater flow can physically occur in several ways where the bedrock geology is close to the ground surface:

1. Shallow subsurface runoff can occur (Smerdon et al, 2009), where water moves laterally in the shallow subsurface prior to reaching the permanent groundwater surface;
2. Flow may occur along thin, high permeability layers perched on bedrock near the mountain fronts;
3. Flow could occur in upper portions (e.g., in several tens of feet or more) of weathered and/or fractured bedrock via fracture flow; or
4. In the uppermost portions of the aquifer, the alluvial deposits may in fact be dry between significant recharge events.

The possibility that dry cells may occur along the elevated margins of groundwater basin models when MODFLOW models are used is well understood. The standard approach when dry cells are generated by this and other mechanisms is to (1) investigate the source of the problem conceptually and mathematically, (2) evaluate potential impacts on the proper functioning of the model (e.g., is recharge still able to enter the model in the proper amounts and at the proper locations, (3) identify corrections or solutions, (4) assure that the selected solution allows the model to maintain proper calibration and mass balance and does not impact the area of the model in which predictions will be made. The focus in this case is to ensure that the locations in the model from which predictions are derived are remote from potentially problematic edge cells and that the appropriate amount of recharge still enters the model at appropriate locations. Under these circumstances, a failure to correctly predict the hydraulic head in a subset of cells along the extreme margins of a study area does not affect the reliability of the model for its intended purpose. The model's reliability is validated if the calibration criteria are met in the area where specific predictions are derived and a reasonable mass balance is achieved.

In MODFLOW, the confined layer configuration maintains the peripheral cells as fully saturated, and flow from the recharge zone to the aquifer at the base of the mountains occurs in a manner consistent with the mountain front recharge rate. As long as the peripheral model cells are configured as confined, a low hydraulic head result in these locations will not create an error in Groundwater Vistas®. A "Translation to MODFLOW 2000" file is created in Groundwater Vistas which documents if any errors or warnings were reported during the run. **Attachment C** presents this Translation to MODFLOW 2000 file for the revised original model and indicates that zero (0) errors were reported during the MODFLOW 2000 run.

Low hydraulic heads near the mountain fronts were also generated in the original AECOM model, but did not produce errors because the base of alluvium in the AECOM model was lowered below the simulated groundwater elevations. The error messages encountered by CEC staff running the RMS model are likely a result of certain GMS® platform settings, which flag the cells as being dry (i.e. inactive) in a model when the model Layer 1 is configured as unconfined or confined/unconfined. The errors should not occur in these cells in the event the layer is configured as confined because the



model will treat the applicable cells as if fully saturated and flows between the cells will be based on the hydraulic gradient computed from the modelled heads.

Sensitivity Analysis of Alternative Modeling Approaches in the RMS Model to Eliminate Dry Cells

The method used by WorleyParsons to maintain the transmission of recharge through cells near the mountain front (which resulted in “dry cell” error messages in CEC staff applications of the model) was compared to the method used by AECOM (which was previously accepted by CEC staff). As discussed above, the AECOM model avoided peripheral cell issues by lowering bottom elevation of the alluvial aquifer. To approximate this approach, the RMS model Layer 1 thickness was adjusted by lowering the Layer 1 bottom elevation in the mountain front areas at least five feet below the simulated groundwater elevation. Although geologically inaccurate, this adjustment allows the model to mathematically incorporate mountain front recharge in a manner consistent with applicable recharge rates and allows for the propagation of drawdown more accurately toward the edges of the model. This “Lowered Bedrock” version of the model was then compared with the “Revised Original” model, or the RMS model derived by adjusting the AECOM model for the BSPP as described above.

In the comparison of the two models, BSPP pumping was not included in the analysis. Consistent with CEC staff comments, the models also assume that construction period water demand will be 400 acre-feet per year (AFY) and will not decrease by one third as assumed in the revised RMS model presented in the August 14 Technical Memorandum.

Figure 2 shows the project related drawdown predicted by the Lowered Bedrock and Revised Original models. Both model results show that project-related drawdown impacts will be less than significant. Consistent with previous studies provided to the CEC, drawdown decreases rapidly away from the pumping wells in the Lowered Bedrock and Revised Original models and is generally similar in extent. Both models predict that the 0.1 ft drawdown contour to the east of the RMS wells will occur in approximately the same locations and will not extend from Palo Verde Mesa Groundwater Basin into the Palo Verde Valley Groundwater Basin.

The maximum predicted drawdown will occur near the pumping wells for the project at the end of construction pumping, and is predicted to be approximately 7 feet. After construction pumping, operational pumping will decrease and groundwater levels near the pumping wells will recover while the overall drawdown cone continues to spread. The maximum lateral extent of predicted drawdown will occur at the end of project operation. At the end of project pumping, the maximum predicted drawdown near the project wells is 4.29 feet in the Revised Original model, and 4.11 feet in the Lowered Bedrock model. Drawdown is predicted to be less than 1 foot at distances greater than 0.3 to 0.6 miles from the pumping wells at the end of project pumping. Measurable drawdown is not predicted to extend westward beyond the site boundaries. Drawdown beneath the undeveloped land immediately north of the site is predicted to be approximately 2 feet near the site boundary and decreasing rapidly northward to 0.3 feet or less at a distance of about 1 mile from the site. Figure 3 compares the drawdown versus time at simulated monitoring well MW-1 in the cell adjacent to the pumping centroid for each model. The drawdown response at MW-1 is very similar in both cases, and drawdown is slightly lower in the Lowered Bedrock model. The maximum predicted drawdown at



simulated monitoring well MW-4, located near the PVID drain at the foot of the mesa, is 0.17 feet in the Revised Original model, and 0.14 feet in the Lowered Bedrock model (Figure 4).

Based on the above modeling analysis of potential groundwater drawdown by the proposed project, groundwater wells on property adjacent to the proposed project are not expected to experience measurable drawdown. The maximum predicted drawdown at an off site well is 0.1 foot at an inactive well located approximately 2 miles north of the site. As such, off-site wells will not be significantly impacted by the project pumping.

Calibration statistics for the Lowered Bedrock and Revised Original models are summarized in Table 1. Both models meet all applicable calibration goals, including the following :

- A residual standard deviation divided by range of less than 10 percent;
- An absolute residual mean divided by range of less than 10 percent; and
- A residual mean divided by range in target heads of less than 5 percent.

As shown in Table 1, the calibration statistics for the Lowered Bedrock and Revised Original models given in Table are virtually identical.

Table 1. Calibration Statistics Comparison

Model Version	Residual Mean	Residual Standard Deviation	Absolute Residual Mean	RMS Error	Minimum Residual	Maximum Residual	Range in Target Heads	Residual Standard Deviation/Range (<10%)	Absolute Residual Mean/Range (<10%)	Residual Mean/Range (<5%)
Revised Original	-0.34	3.43	2.82	3.45	-8.75	5.93	55.91	6.1%	5.0%	-0.6%
Lowered Bedrock	-0.26	3.45	2.82	3.46	-8.75	6.27	55.91	6.2%	5.0%	-0.5%

Hydrograph for Simulated Monitoring Well MW-4

During the meeting on August 16, a very slight increase in the groundwater level was simulated in the hydrograph for simulated monitoring well MW-4. Although the increase was insignificant (on the order of 0.01 feet), upon closer evaluation (and as pointed out by CEC staff), we found that the revised mountain front recharge rates (discussed in detailed in August 14th memorandum) applied to the recharge cells had not been applied for each stress period of the model at that time. When the recharge rates were corrected across all stress periods in the updated version of the model, the hydrograph for MW-4 no longer showed an increase in water level in both the Lowered Bedrock and Revised Original versions of the model, as shown in Figure 4. As a result, the MW-4 issue identified by CEC staff has been fully addressed in the revised models.

Conclusion

All versions of the RMS model to date (including four different refinements of the model in response to CEC comments) have generated comparable results and calibration statistics. Each shows that the project’s groundwater impacts will be less than significant. The consistency of the results indicates that the RMS models provide a reliable, hydrogeologically realistic and valid method for assessing project impacts.

The PSA includes an assessment of RMS drawdown using the USGS WTAQ modeling code. As the PSA concedes, the WTAQ is a simple, one-dimensional analytical model developed to analyze pump



test drawdown data for the purpose of estimating aquifer properties (Barlow and Moench, 2011). By its nature, the model includes several simplifying assumptions, including an aquifer that is uniform, isotropic, of infinite aerial extent and constant in thickness. None of these assumptions are applicable to the RMS area, and the WTAQ does not allow for the incorporation of boundary conditions, recharge, groundwater gradients, variations in aquifer thickness or variations in aquifer properties that might refine the results for project analysis purposes. As used in the PSA, the WTAQ model is also not calibrated to verify long term drawdown predictions. The use of WTAQ in this manner to discuss project impacts, particularly in lieu of the calibrated MODFLOW model discussed above, is technically unsound. The drawdowns calculated by the WTAQ are in the PSA more than an order of magnitude greater than predicted by an accurate, calibrated model. The best available, scientifically defensible analysis, therefore, demonstrates that project drawdown impacts will be less than significant.

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Stone & Webster Engineering Corporation, 1976. *Evaporation Basin Report. SunDesert Nuclear Plant San Diego Gas & Electric Company, San Diego, California.* June 1976.

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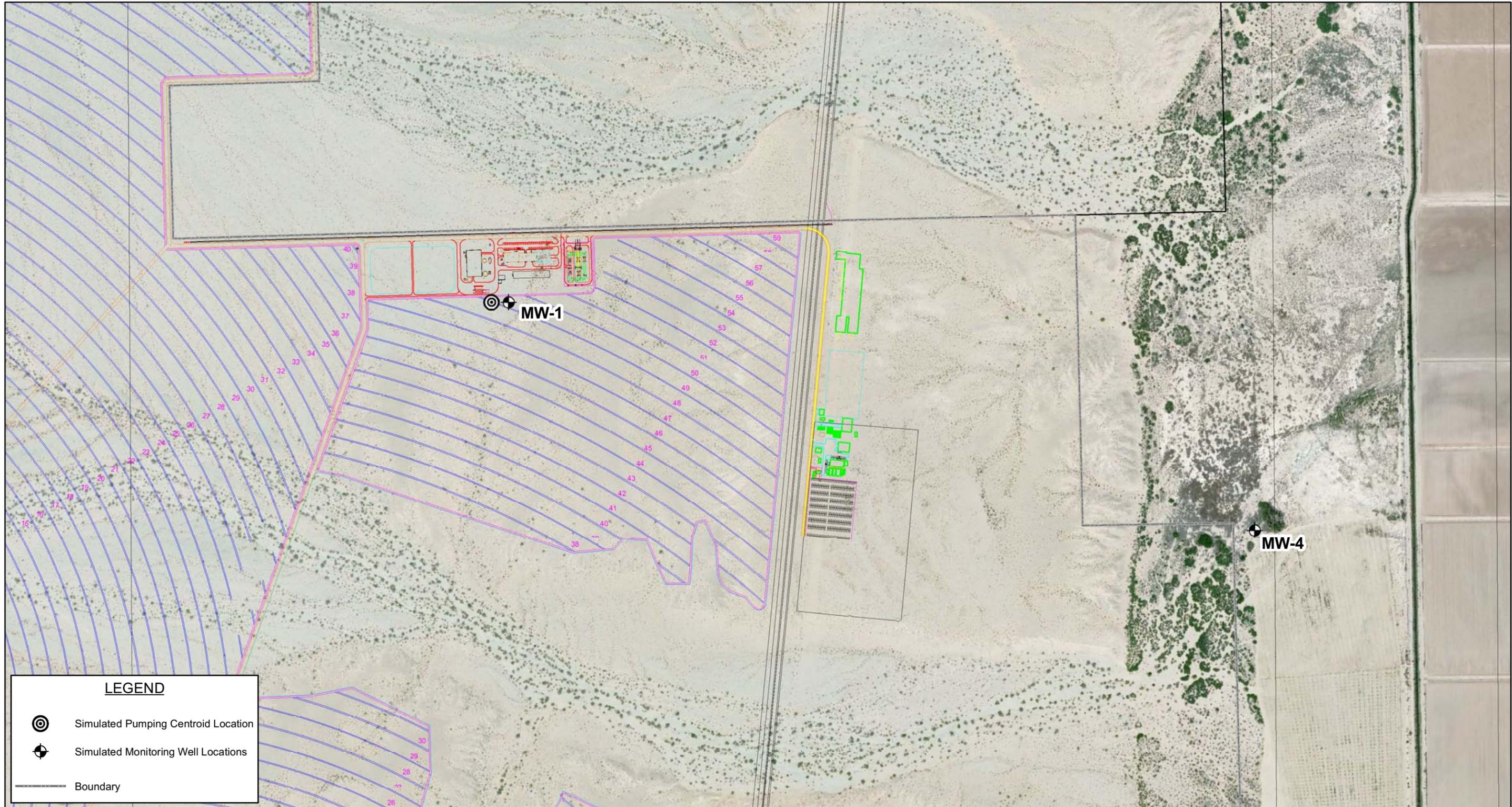
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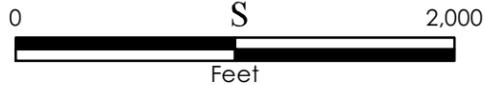
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Figures



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POWER PROJECT

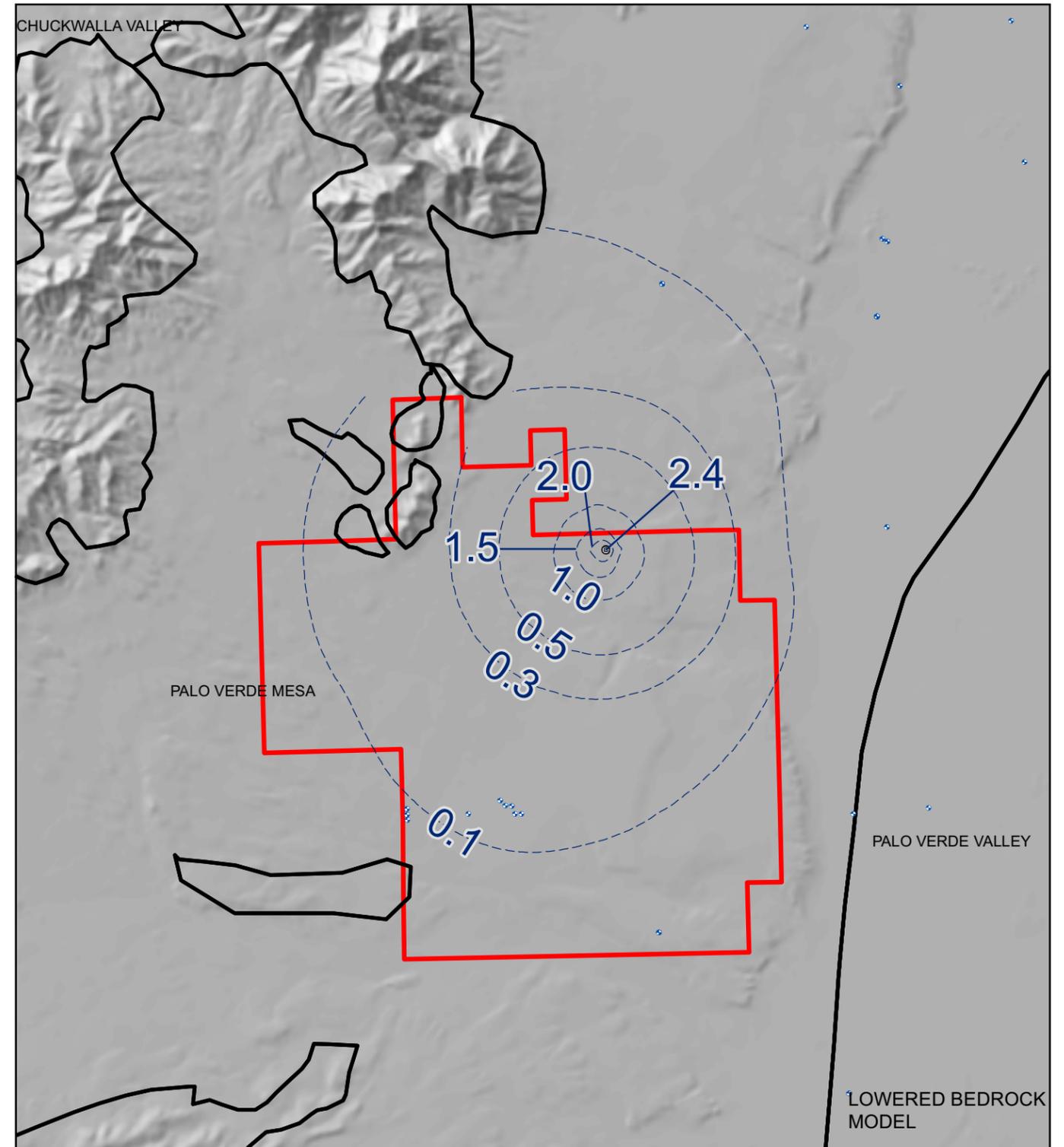
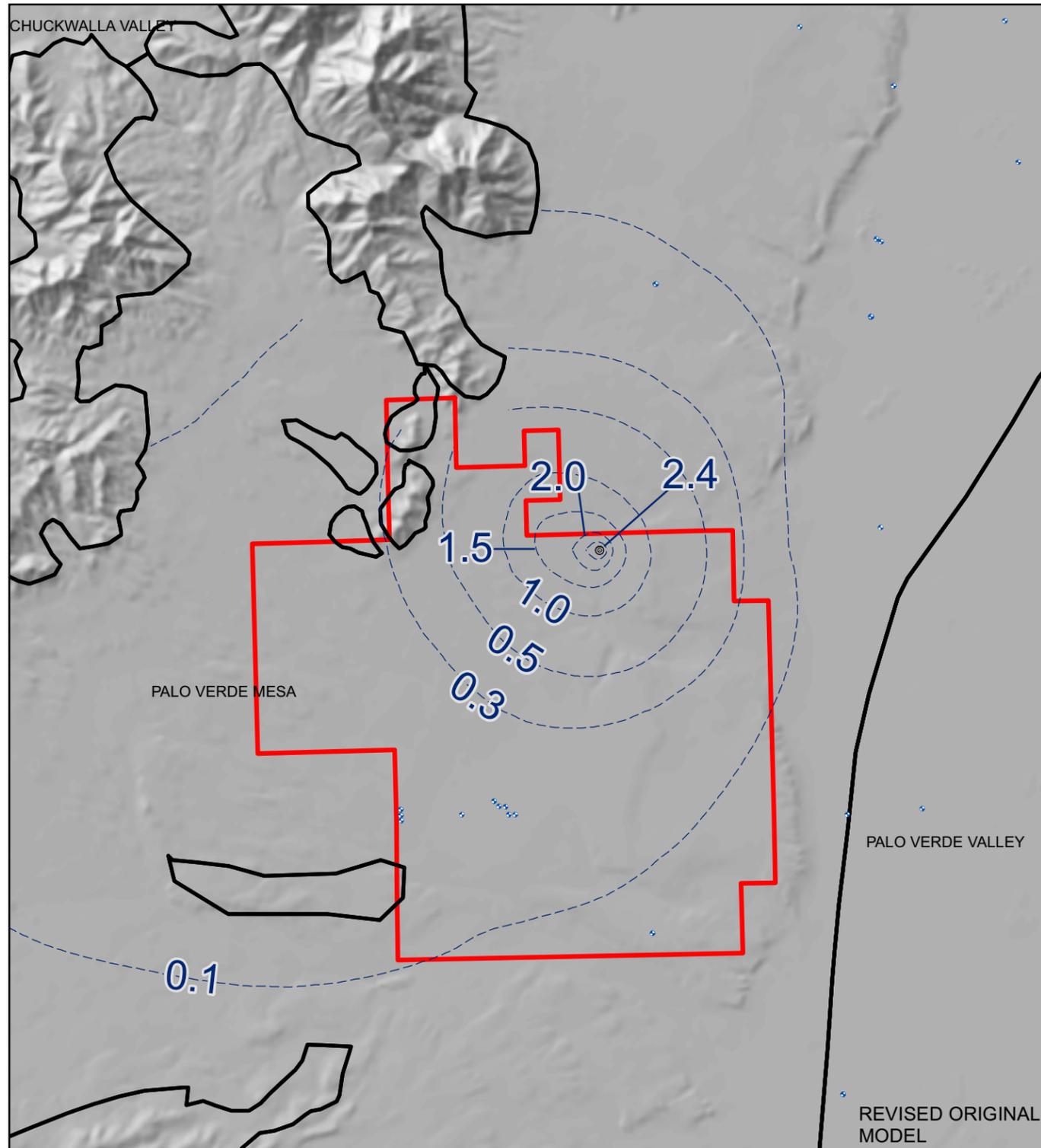


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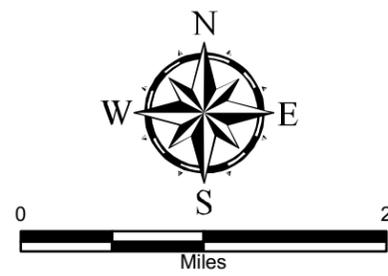
SIMULATED PUMPING CENTER LOCATION

SWL MT 10/2012

308038-03598



SOURCE:
 USGS 10 Meter DEM
 California Department of Water Resources,
 B118_BasinBoundaries_v41
 All locations approximate.



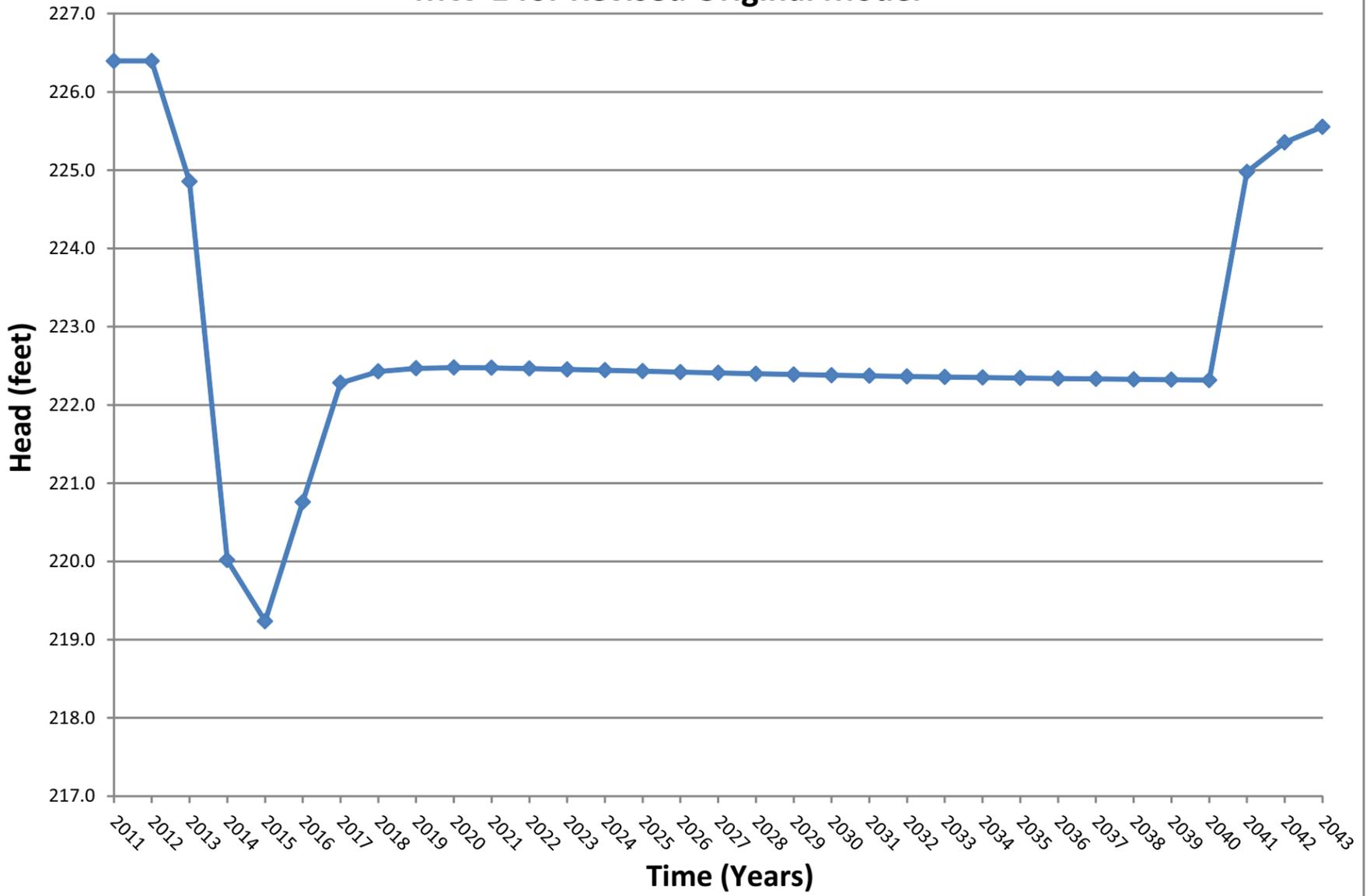
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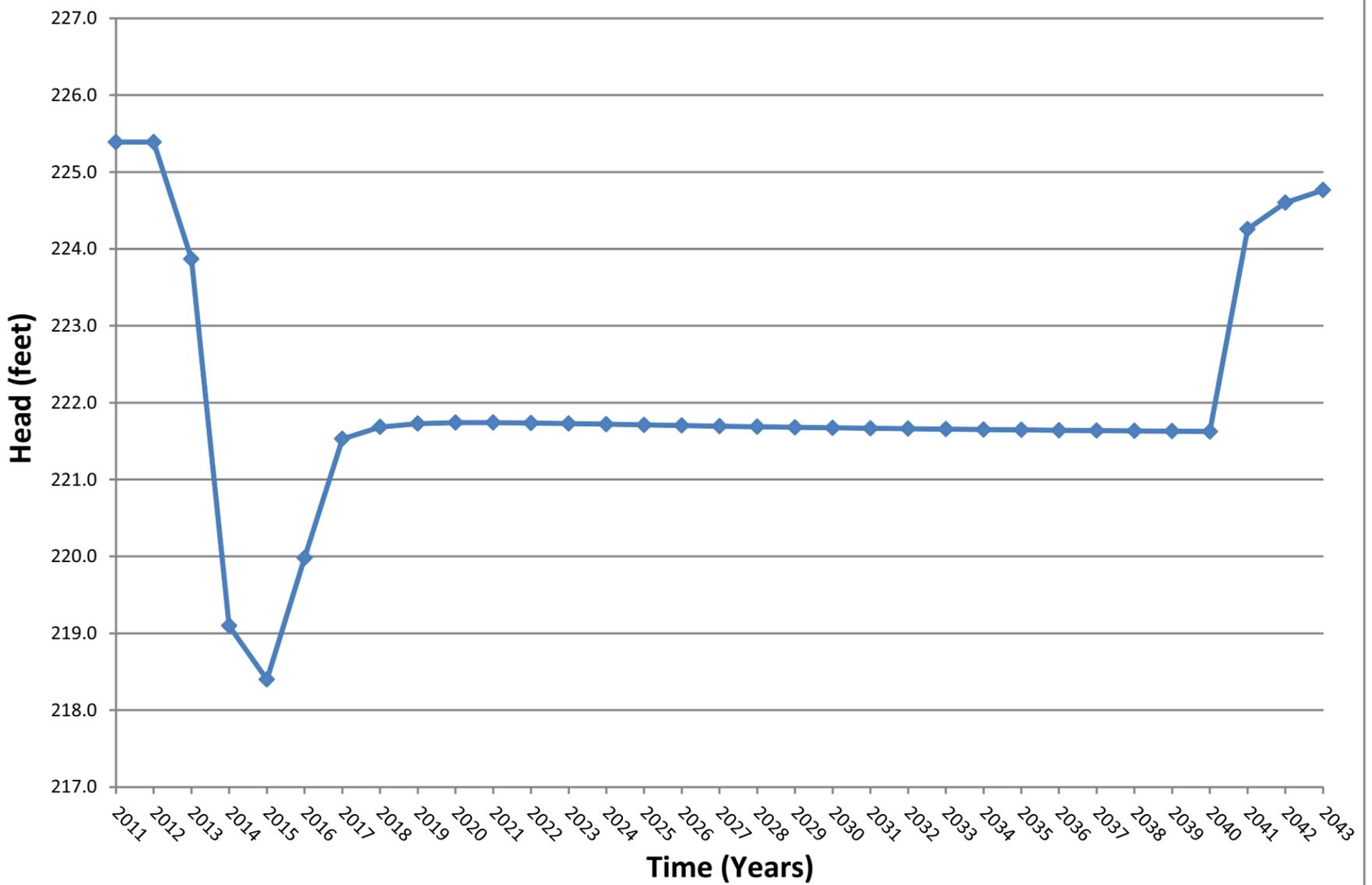
**DRAWDOWN CONTOUR MAP COMPARISON
 YEAR 31 AT END OF RMS PUMPING**

SWL	MT	10/2012
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**Hydrograph of Simulated Monitoring Well
MW-1 for Revised Original Model**



**Hydrograph of Simulated Monitoring Well
MW-1 for Lowered Bedrock Model**



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**HYDROGRAPHS OF SIMULATED MONITORING WELL MW-1
FOR REVISED ORIGINAL AND LOWERED BEDROCK MODEL**

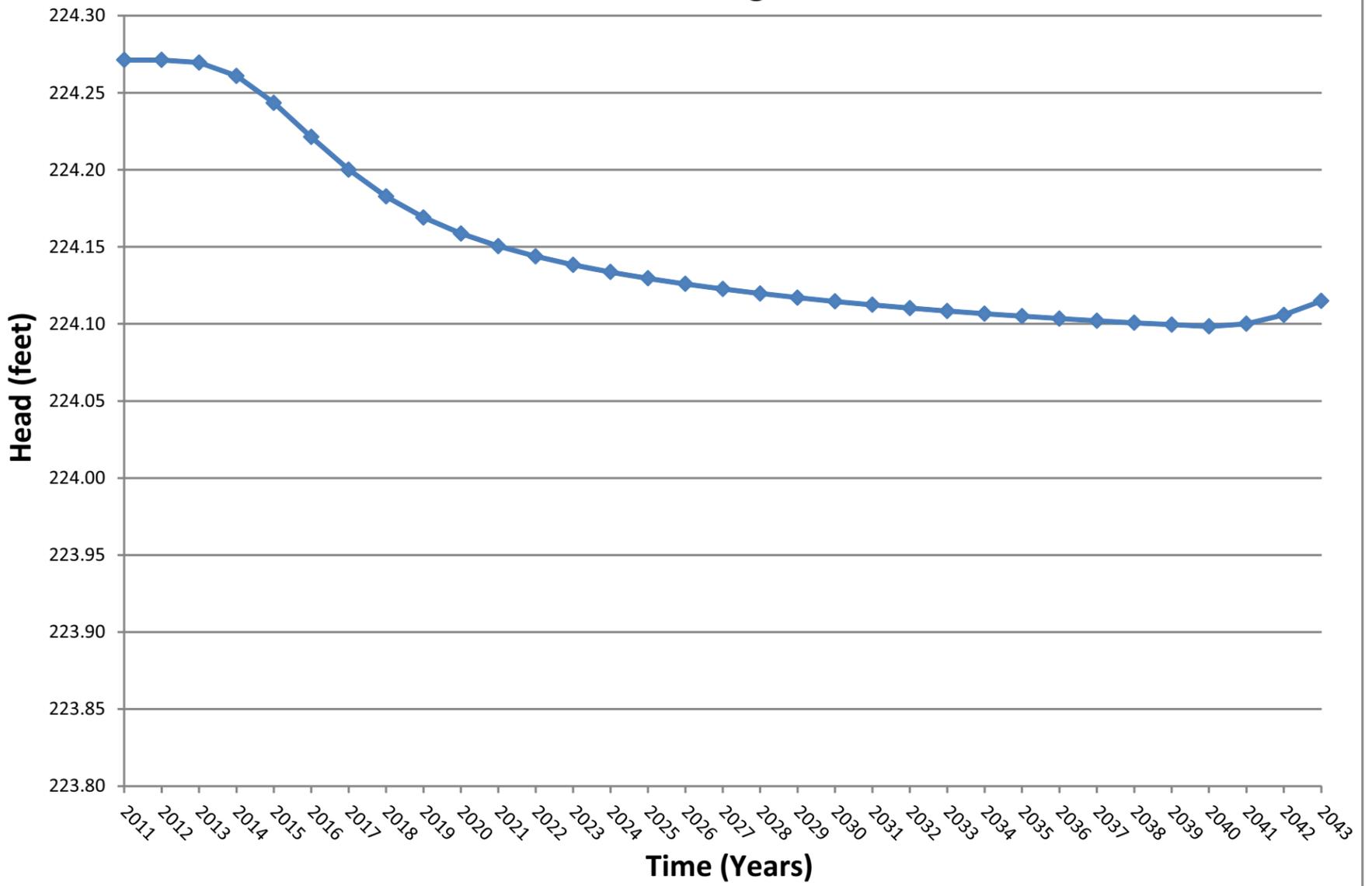
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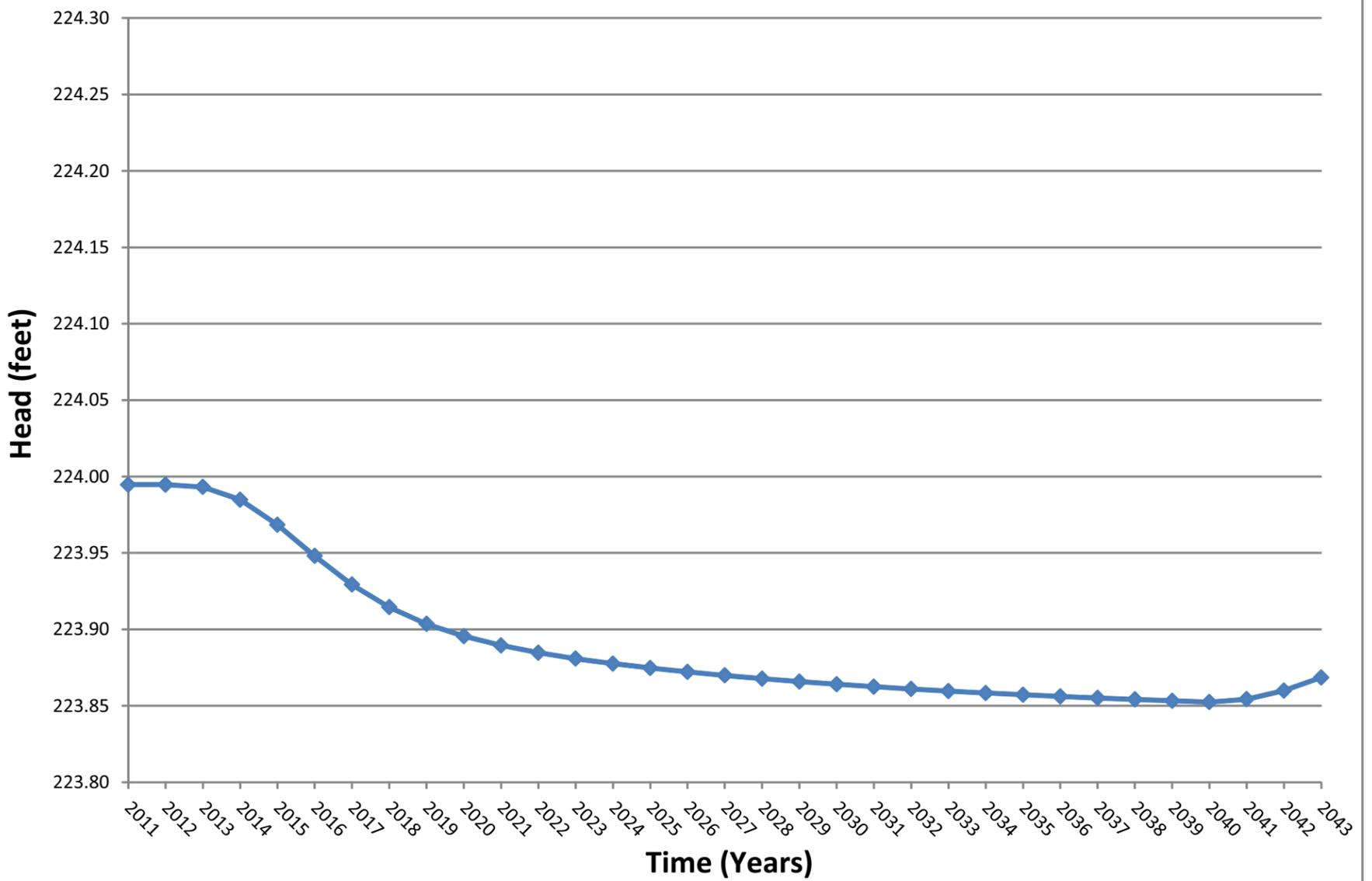
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308038-03598

Hydrograph of Simulated Monitoring Well MW-4 for Revised Original Model



Hydrograph of Simulated Monitoring Well MW-4 for Lowered Bedrock Model



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**HYDROGRAPHS OF SIMULATED MONITORING WELL MW-4
FOR REVISED ORIGINAL AND LOWERED BEDROCK MODEL**

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Attachment A

1. Groundwater Storage Coefficient

- a. The model used a storage coefficient of 0.3 but the Groundwater Impact Assessment Report (GIAR) states that a coefficient of 0.2 was used. Which coefficient should be used?
- b. The USGS model used a coefficient of 0.2. The GIAR states that the model is just a refinement of the USGS model. Why is a coefficient different than the USGS model used?

Response:

The GIAR states that the RMS model is a refinement the existing model for the Blythe Solar Energy Project (BSEP) prepared by AECOM (AECOM, 2010). The existing model by AECOM was the most recent model of the area, was prepared for a similar purpose, and had been reviewed and vetted by the CEC. AECOM's report indicates a Storage Coefficient of 0.2 was used in the BSEP model and the aquifer was modeled as unconfined, consistent with the USGS model on which it was based (Leake, et al, 2008). We did not change the Storage Coefficient from the BSEP model; however, the value used by AECOM differs from the USGS model and the value cited in AECOM's report. Unfortunately, this discrepancy was inadvertently omitted from the RMS model documentation in the GIAR, but is appropriately handled in the model as discussed further below.

Upon reviewing the BSEP model and updating it for the RMS project, we found that it handled the aquifer as confined with a Specific Storage of 0.004 assigned to each cell, which is different from what was stated in AECOM's report and from the properties used in the USGS model. AECOM appears to have made this change as a necessary refinement of the USGS model. On further review, the lower storage coefficient and confined aquifer interpretation are consistent with hydrogeologic data from pumping tests conducted for wells completed in the Older Alluvium. The Specific Storage value derived from the pumping test conducted for the Sun Desert project on the Rio Mesa site was 0.001. Similarly, the analysis of pumping tests conducted on wells PW-1 and PW-2 at the Blythe Energy Project indicated Storage Coefficients of 0.04. Each of these pumping tests thus indicate the aquifer properties of the Older Alluvium may be best characterized as semi-confined. It would be expected in alluvial aquifers where some vertical anisotropy exists to have deeper layers respond as a semi confined, or leaky confined, aquifer. Modeling the aquifer as confined (or semi-confined) with a lower Specific Storage will tend to make it more sensitive to pumping-related effects, resulting in a greater magnitude of drawdown as well as a greater lateral propagation of drawdown. This may be seen in AECOM's original modeling study (Appendix J-1 and J-2 of the AFC, attached), where the aquifer was modeled using Storage Coefficient of 0.2 and 0.05, and maximum drawdown as well as the distance to the 1 foot drawdown contour increased with a decreased Storage Coefficient.

It should be kept in mind that the model simplifies the aquifer as a single layer with the properties of a semi-confined aquifer, which is consistent with the data from pumping wells in the area. It will tend to over-predict drawdown for wells completed in the overlying Younger Alluvium, where unconfined conditions likely prevail. As such, this representation of the aquifer is appropriate for the stated purpose and may be considered conservative.

2. The specific yield in the model is zero. Please check. This could have been a translation error from the GW Vistas platform to GMS.

Response: The aquifer it treated as semi-confined in the model and therefore the Specific Yield is not applicable and set to zero.

3. The report states that injection wells are used for the Parker Valley flux. Injection wells are not present in the model at this location. Please explain.

Response: Underflow from Parker Valley into Palo Verde Valley is simulated by a single injection well located along the river in the northeast area of the model domain. This cell is shown on Figure 3-1. This is the same approach as the BSEP model

4. The model uses injection wells at the Mule and Palo Verde Mountains to simulate mountain front recharge. There are several other locations where these injection wells can be placed. Placement of injection wells at this location will cause the model to reduce project pumping drawdown effects. Explain why this location was chosen for the injection wells.

Response: In the BSEP and RMS models, injection wells are used only to simulate underflow into the basin from Chuckwalla Valley and from Parker Valley as shown on Figure 3-1. Mountain front recharge is simulated using recharge cells spread out along the mountain fronts. The locations of these recharge cells may be observed in the model. AECOM's model for the BSEP did not simulate any mountain front recharge in the southern part of the basin along the Mule and Palo Verde Mountains. Mountain front recharge would be expected to occur along all of the mountains that surround the basin, and not to be limited to just the northern portion. In the RMS model, mountain front recharge cells were therefore added along the Mule and Palo Verde Mountains to correct this omission. The calculated mountain front recharge for the basin was then divided equally among all of the recharge cells on a unit area basis. The result is a more accurate and reasonable handling of recharge throughout the entire model domain in the RMS model than in the BSEP model.

5. A model program error check states that the starting head elevation is lower than the base of the aquifer layer. Please check. This could have been a translation error from the GW Vistas platform to GMS.

Response: Some of the cells in the higher and thinner parts of the basin would be expected to be dry, and this is reflected in the model's starting condition. The model handles this by simulating a water level in those cells that is below the base of the aquifer, which generates an error message for those cells.

6. Calibration Standard Deviation
 - a. What is the range? Is it the min/max of the residual relative head values or the min/max of the residual heads values relative to a datum such as mean sea level?

Response: The values are relative to mean sea level as indicated in Table 3-1.

- b. The GIAR states that a residual Std Dev target of 10% was used for the calibration statistics. This seems high to us and that a 5% Std Dev is appropriate. The difference in residuals heads is almost 10 feet for some coordinate locations. This seems great when the overall gradient in the model area varies by only about 50 feet.

Response: *The 10% criterion was adopted from AECOM's BSEP model, which was previously accepted by the CEC. Regardless of this, Table 3-1 indicates a Residual Standard*

Deviation/Range of 6.3% and an Absolute Residual Mean/Range of 5.3%, which are both very close to 5%.

7. Groundwater Contouring

- a. In the northwest area of the modeled zone, the observed groundwater gradient is 90 degrees different than the gradient produced by the model. Why was the gradient forced in the model?

Response: As shown on Figure 3-6, there is only one well located in the approximately 140 square mile area that makes up the northwestern-most portion of the Palo Verde Mesa and model domain. This single value was not used in contouring, as it would have created a “bullseye effect” without adding additional artificial data points. The contouring program therefore extended the 250 foot contour into this area based on data further to the south, and at a 90 degree angle to actual anticipated contour direction. We could have inferred contours to reflect our understanding of groundwater flow in this area or truncated the contours in a question mark, but did not do so since this portion of the basin is remote from the area of interest to the study. Our failure to manipulate the contours in this area in no way affects the outcome of the modeling analysis.

The contoured model outputs are also shown in Figure 3-6, and are based on the modeled water level elevations for each cell. The results were not forced by manipulation or addition of artificial data points. The predicted water level elevations reflect the influence of mountain front recharge in the model and show the expected direction of groundwater flow, which is toward the southeast.

Interestingly, the groundwater level elevation for the one well in this area is 318 feet. This is approximately consistent with the water level contouring and flow direction suggested by the model outputs.

- b. GSA report states that the McCoy Mountains are sedimentary rock overlaying Jurassic volcanic rocks (rhyodacite porphyry). Where the groundwater intercepts the Mtns, the rock appears to be sandstone/conglomerate/mudstone. Given the high permeability of this rock, the groundwater gradient could be towards the McCoy Mountains.

Response: In its description of the Palo Verde Mesa and Chuckwalla Valley Groundwater Basins, DWR describes the bedrock of the surrounding mountains as being generally impermeable. USGS has adopted the same assumption in its evaluation of the Colorado River Aquifer (Leake, 2008 and others). Although the McCoy Mountain Formation includes fluvial sandstone and conglomerate members, they are well lithified (turned into rock) by consolidation, cementation and alteration of the mineral grains. As a result, these rocks stand in bold vertical relief. The GSA paper indicates that the lithification process (diagenesis) of these rocks included deposition of silica, ferrous and carbonate cements, as well as alteration of the lithic and feldspar grains. This process would have resulted in a significant

loss of permeability. Beyond this, the cited GSA paper describes the formation as having undergone low level metamorphic alteration, with resulting deposition of up to 20 percent of secondary mineralization in the rock matrix. The permeability of the McCoy Mountain Formation would therefore be expected to be very low compared to the adjacent basin fill alluvial deposits of the Palo Verde Mesa. Flow into this formation from the Palo Verde Mesa is therefore extremely unlikely.

- c. Try removing the one data point in the far northwest corner of the modeled area and redraw the contours. Do the contours map out differently?

Response: The point was not used in contouring

8. Re-run model and revise report with above corrections and now that 1/3 less operation groundwater would be used. The construction water volume used would also be less.

Response: BSE intends to update and re-run the model once we receive concurrence from CEC regarding the modeling parameters and confirm the updated pumping rates and locations for the amended two-unit project. Since pumping rates are expected to decrease, the results of the modeling conducted so far may be considered conservative.

TABLE J-1
RESULTS OF NUMERICAL GROUNDWATER MODELING
PROPOSED CONSTRUCTION AND OPERATIONAL WATER USE
STORAGE COEFFICIENT OF 0.20
BLYTHE SOLAR POWER PROJECT
PALO VERDE MESA, RIVERSIDE COUNTY, CALIFORNIA

MODEL SCENARIO ¹	Pumping Rate Construction/Operation (gpm)	Period Construction/Operation (years)	Storage Coefficient	Transmissivity	Maximum Depression in the Pumping Well	Distance to a Drawdown of 5 Feet ²	Distance to a Drawdown of 1 foot ²
			--	(ft ² /day)	(ft)		
Construction							
Average Transmissivity	700	5.67	0.2	26,200	6.88	60	7,760
Low Transmissivity	700	5.67	0.2	6,300	25.94	2,720	11,330
Maximum Transmissivity	700	5.67	0.2	93,600	2.14	--	840
Operation							
Average Transmissivity	400	30	0.2	26,200	4.67	--	12,100
Low Transmissivity	400	30	0.2	6,300	17.06	2,790	22,810
Maximum Transmissivity	400	30	0.2	93,600	1.51	--	285

Notes

- 1 Model results shown on Figure J-2 through J-4 of this technical memorandum.
- 2 Distance measured from the pumping well to the referenced contour.

**TABLE J-2
RESULTS OF NUMERICAL GROUNDWATER MODEL
CONSTRUCTION AND OPERATIONAL WATER USE
STORAGE COEFFICIENT - 0.05
BLYTHE SOLAR POWER PROJECT
PALO VERDE MESA, RIVERSIDE COUNTY, CALIFORNIA**

MODEL SCENARIO ¹	Pumping Rate Construction/Operation (gpm)	Period Construction/Operation (years)	Storage Coefficient	Transmissivity	Maximum Depression in the Pumping Well	Distance to a Drawdown of 5 Feet ²	Distance to a Drawdown of 1 foot ²
			—	(ft ² /day)	(ft)		
Construction							
Average Transmissivity	700	5.67	0.05	26,200	7.71	165	17,350
Low Transmissivity	700	5.67	0.05	6,300	28.54	5,770	22,440
Maximum Transmissivity	700	5.67	0.05	93,600	2.48	—	3480
Operation							
Average Transmissivity	400	30	0.05	26,200	5.43	15	25,650
Low Transmissivity	400	30	0.05	6,300	19.33	8,350	44,000
Maximum Transmissivity	400	30	0.05	93,600	1.59	—	540

Notes

- 1 Model results shown on Figure J-5 through J-7 of this technical memorandum.
- 2 Distance measured from the pumping well to the referenced contour.



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Attachment B



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14 August 2012

TO	TECHNICAL MEMORANDUM
FROM	Mark Trudell
COPY	Michael Rojansky
PROJECT NAME	BrightSource Rio Mesa Impact Assessment Modeling
PROJECT NO.	
SUBJECT	Updated Groundwater Resource Impact Modeling
FILE LOC.	

TECHNICAL MEMORANDUM

A groundwater flow model was developed to assess potential impacts of groundwater pumping for the Rio Mesa Solar (RMS) project water supply on flows related to the Colorado River in the Palo Verde Valley. The existing single layer MODFLOW model developed for the Blythe Solar Energy (BSE) project by AECOM was used as the starting point for the RMS modeling. The BSE model was modified for the RMS project and the results were presented in the Groundwater Impact Assessment Report (WorleyParsons 2011a). On July 17, 2012, after reviewing the WorleyParsons model, the California Energy Commission (CEC) had requested that a technical memorandum be presented to discuss the following items:

- New pumping locations with a decrease in flow of 1/3 the original rate;
- Redistribution of recharge along the mountain range fronts;
- Elimination of the Palo Verde Mesa recharge;
- Determination of new drawdown as a result of a new pumping location and rate;
- Review of new calibration statistics; and
- Investigation of the error messages indicating dry cells around the mountain front perimeter of the model domain.



New Pumping Well Locations and Rate

As part of the proposed environmental enhancement, the project proposed to eliminate one of the three units. Groundwater demand will decrease by approximately 1/3 during the construction and operation phases. The common area wells were proposed to be moved south of Common Area of the site. In the Groundwater Vistas® model developed and reported in Groundwater Impact Assessment Report, dated September 2011 (WorleyParsons 2011b), three pumping wells were inserted into the model. These pumping wells were defined as constant flux (well) boundary conditions with each pumping well occupying a single grid cell. Each of these constant flux (pumping well) boundary condition cells were approximately 25 feet in length by 25 feet in width (625 square feet). When these pumping wells were moved to be located near the southern portion of the Common Area of the site, the grid cells in the new area were 100 feet in length by 25 feet (2,500 square feet). As a result the three pumping wells were combined into the single cell as pumping centroid and defined again as a constant flux (well) boundary condition. **Figure 1** illustrates the new pumping location which is referred to as a pumping centroid as the cell now contains the sum of the three original pumping rates with a decrease in 1/3 of the original flow rate. **Figure 1** also includes the location of one monitoring well, moved to be located adjacently to the east of the pumping centroid remaining in between the Palo Verde Irrigation Drain (PVID) and the pumping centroid. A second monitoring well (MW-4) was retained along the edge of the Palo Verde Valley to monitor drawdown near the PVID drains.

Redistribution of Mountain Front Recharge

As explained in detail in WorleyParsons 2011a, recharge from precipitation was estimated by applying the runoff-recharge method of Hely and Peck (1964) in the same manner as applied by AECOM (2010) and CEC (2010). AECOM (2010) divided the Palo Verde Mesa Groundwater Basin into localities that approximated the localities as described by Hely and Peck (i.e. mountains, hills, alluvium-steep slope or alluvium-shallow slope) and then calculated the area for each locality. WorleyParsons verified the areas used by AECOM (2010) and in some cases, particularly for the runoff areas of the Mule and Palo Verde Mountains, expanded the areal analysis used by AECOM (2010). The revised mapping and areas are shown in **Figure 6-2** and given in **Table 6-2** of WorleyParsons 2011a (included herein for reader convenience).

The recharge calculation of CEC (2010) used 3 to 5% of precipitation to estimate recharge from precipitation. For mountain front recharge with 302,000 acres and an average annual precipitation of 4.3 inches, these percentages yield 3,159 acre-feet per year (AFY) (3%) and 5,265 AFY (5%). Based on the CEC calculation, we assumed a value of 5,300 AFY for recharge from precipitation (5%). According to AECOM (2010), the majority of this recharge is expected to occur as mountain front recharge. Consequently, the combined recharge from precipitation in the mountains and related alluvial fan areas was applied in the model as an areal recharge rate applied in the band of model cells closest to the mountains within the model domain. The proportion of recharge for each mountain range was made proportional to its precipitation, as a percentage of overall mountain precipitation. That is, the percentage of total mountain precipitation for each range was multiplied by 5,300 AFY to give the amount of recharge to be applied to the recharge boundary cells in each range. The total recharge for each range in cubic feet per year (ft³/yr) was divided by the total area of recharge cells in



the range to give the recharge rate as cubic feet per day (ft³/day). The results are given in the attached **Table 1**, which is a modified version of **Table 6-2** from WorleyParsons 2011a.

Metzger et al. (1973) and Owens-Joyce (1984) estimated that recharge from surface water through the McCoy Wash was 800 AFY and from the Palo Verde Mountains was 1,200 AFY, for a combined total of approximately 2,000 AFY. As shown in **Table 1**, our recharge estimates for the Mule Mountains and Palo Verde mountain ranges is 2,063 AFY (i.e., 203 + 1,860 AFY, respectively).

Elimination of the Palo Verde Mesa Recharge

CEC had requested that the areal recharge across the Palo Verde Mesa be eliminated. As a result the recharge values in the Palo Verde Mesa grid cells were set to zero (0).

New Drawdown Resulting from New Pumping Rate and Location

Contours of drawdown in response to the new RMS pumping rate with newly distributed recharge rates for the mountain fronts and zero recharge in the Palo Verde Mesa Basin after 31 years of simulation time (end of RMS pumping) are shown in **Figure 2**. **Figure 2** shows that drawdown from new RMS pumping (mapped to 1.5 feet of drawdown) is limited to the Mesa Basin and does not extend in to the Palo Verde Valley. Maximum drawdown near the RMS pumping wells is 4.0 feet at the end of pumping. Because this drawdown is relatively small, modeling of other pumping scenarios using additional on-Site wells during construction was deemed to be unwarranted. The second monitoring well (MW-4) which was retained along the edge of the Palo Verde Valley to monitor drawdown near the PVID drains indicated a drawdown of approximately 0.05 feet at the end of pumping.

Drawdown impacts from BSE project pumping are shown in AECOM 2010 and are not predicted to extend to the RMS Site. This was also observed during the modeling study performed by WorleyParsons in 2011 (WorleyParsons 2011a).

Based on the similarity of modeled drawdown results with those previously obtained (proportionally reduced by the pumping rate) and application of the same total mountain front recharge (albeit distributed differently), we believe it is fair to conclude that changes in groundwater discharge to the PVID drains and/or the Colorado River will be negligible under the revised project conditions, as they were reported for the previous project conditions.

Review of Calibration Statistics

The Groundwater Impact Assessment Report (WorleyParsons 2011b) indicates the method used to obtain model calibration. Calibration statistics for the updated model are provided below. Typically used calibration goals are summarized as follows:

- Residual standard deviation divided by range in less than 10 percent;
- Absolute residual mean divided by range in less than 10 percent;



- Residual mean divided by range in target heads less than 5 percent; and
- Limited spatial bias in the distribution of residuals.

Table 2. Calibration Statistics, Final Calibrated Updated RMS Model

Residual Mean	Residual Standard Deviation	Absolute Residual Mean	RMS Error	Minimum Residual	Maximum Residual	Range in Target Heads	Residual Standard Deviation/Range (<10%)	Absolute Residual Mean/Range (<10%)	Residual Mean/Range (<5%)
-0.46	3.45	2.84	3.48	-8.75	5.93	55.91	6.2%	5.1%	-0.8%

The calibration statistics in **Table 2** above show that the calibrated model meets all of the calibration goals.

Error Messages Regarding Dry Cells

Datasets were created within the revised model that is discussed in this Technical Memorandum and the model was run with MODFLOW 2000. When the model was run, a Translation to MODFLOW 2000 file was created which indicates if any errors or warnings were reported during the run. **Attachment A** presents this Translation to MODFLOW 2000 file and indicates that zero (0) errors were reported during the MODFLOW 2000 run. The error message regarding dry cells around the mountain front perimeter of the model domain obtained by CEC may be a Groundwater Model System (GMS) implementation error.



References

AECOM, 2010. *Blythe Solar Power Project – Numerical Groundwater Flow Model of the Palo Verde Valley and Palo Verde Mesa*, Prepared for Palo Verde Solar I, LLC, October 2010.

California Energy Commission (CEC), 2010. *Final Decision – Blythe Solar Power Project: Conditions of Certification SOIL&WATER-2 and -16*, California Energy Commission, Sacramento, California.

Hely, A.G., and Peck, E.L., 1964. *Precipitation, Runoff and Water Loss in the Lower Colorado River-Salton Sea Area*, Geological Survey Professional Paper 486-B.

Metzger, D.G. and others, 1973. *Geohydrology of the Parker-Blythe-Cibola Area, Arizona and California*. U.S. Geological Survey Professional Paper 486-G. 130 pages.

Owen-Joyce, S.J., 1984. *A Method for Estimating Ground-Water Return Flow to the Colorado River in the Palo Verde Cibola Area, California and Arizona*: U.S. Geological Survey Water – Resources Investigations Report, 84-4236, 48p.

WorleyParsons, 2011a. *Groundwater Impact Assessment Report, Rio Mesa Solar Electric Generating Facility Riverside County, California*, September.

WorleyParsons, 2011b. *Assessment of Existing Groundwater Conditions Report, Rio Mesa Solar Electric Generating Facility Riverside County, California*, September.



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Tables



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Table 1

Mountain Front Recharge Estimate for Boundary Cells

Palo Verde Mesa Groundwater Basin

Layer (1)	Area (acres)	Mean Annual Precipitation (inches) (2)	Total Volume of Rainwater from Mean Annual Precipitation (af)	Total Annual Volume of Infiltration (AF) based on 5 percent of Precip.	Total Area of Recharge Cells (ft ²)	Bedrock area pptn as % of total pptn	Total Annual Volume of Infiltration (AF) based on 5 percent of precip.	Recharge Rate for Recharge Cells, ft ³ /d, based on 5 percent of precip.
unit1-pvm	23,731	4	7,910	396				
bedrock1-pvm Little Maria Mts	7,807	4	2,602	130	3.7730E+07	9.39%	494	1.5626E-03
bedrock2-pvm Mule Mts	3,664	3.5	1,069	53	3.4075E+07	3.86%	203	7.1052E-04
bedrock3-pvm McCoy Mts	12,661	4	4,220	211	7.8360E+07	15.23%	802	1.2202E-03
bedrock4-pvm Big Maria Mts	20,073	6	10,037	305	8.0690E+07	36.21%	1907	2.8179E-03
bedrock5-pvm Palo Verde Mts	33,564	3.5	9,790	489	7.6121E+07	35.32%	1860	2.9136E-03
unit1-pvm	78,714	5	32,798	1640				
unit2-pvm	122,451	4	40,817	2041				
Totals	302,665	---	109,242	5,265		100.00%	5265	0

Notes:

1) See Figure 6-1

2) From Hely & Peck, 1964.

Source: Layer mapping from AECOM, 2010. Areas derived by WorleyParsons



Table 6-2

**Runoff and Infiltration Estimates
Palo Verde Mesa Groundwater Basin**

Layer (1)	Area (acres)	Mean Annual Precipitation (inches) (2)	Total Volume of Rainwater from Mean Annual Precipitation (af)	Runoff Curve Classification (2)	Runoff Curve Number (2)	Runoff (percent of Precipitation)	Total Annual Volume of Runoff (Infiltration) Hely & Peck (AF)	Total Annual Volume of Infiltration AFf based on 3 percent (3)	Total Annual Volume of Infiltration (AF) based on 5 percent (3)
unit1-pvm	23,731	4	7,910	Alluvium, Steep Slope	74	3.50%	277	237	396
bedrock1-pvm	7,807	4	2,602	Hills	83	10%	260	78	130
bedrock2-pvm	3,664	3.5	1,069	Mountains	93	29.10%	311	32	53
bedrock3-pvm	12,661	4	4,220	Mountains	93	29.10%	1,228	127	211
bedrock4-pvm	20,073	6	10,037	Mountains	93	29.10%	2,921	183	305
bedrock5-pvm	33,564	3.5	9,790	Mountains	93	29.10%	2,849	294	489
unit1-pvm	78,714	5	32,798	Alluvium, Steep Slope	74	3.50%	1,148	984	1640
unit2-pvm	122,451	4	40,817	Alluvium ,Flat Slope	69	2%	816	1225	2041
Totals	302,665	---	109,242	---	---	---	9,810	3,159	5,265

Notes:

- 1) See Figure 6-1
- 2) From Hely & Peck, 1964.
- 3) Based on a percent of Total Volume of Rainwater from Mean Annual Precipitation (Column 4).

Source: Layer mapping from AECOM, 2010. Areas derived by WorleyParsons

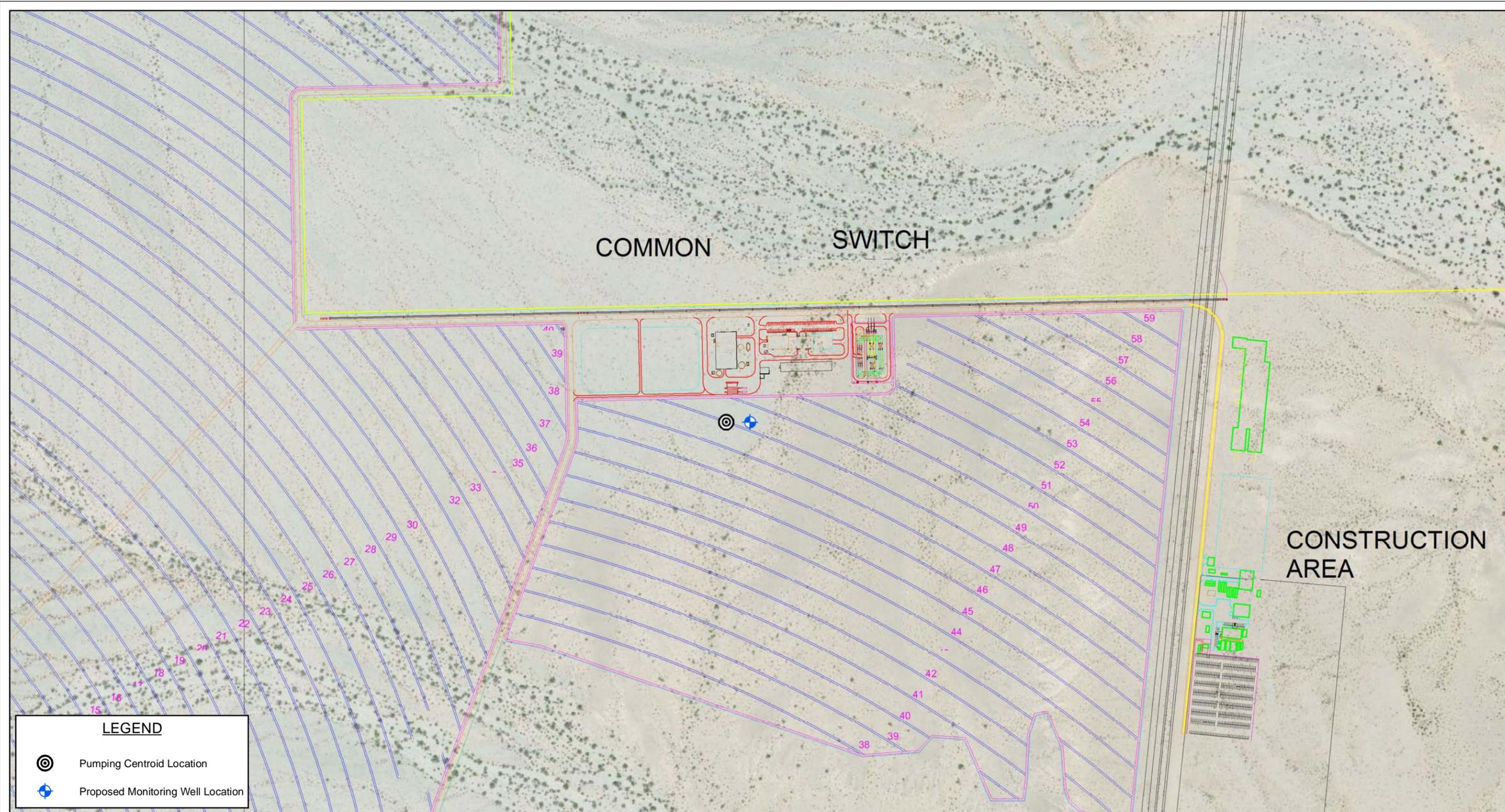


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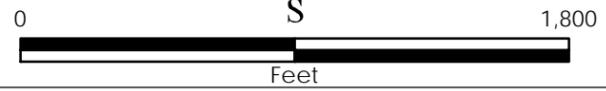
Figures



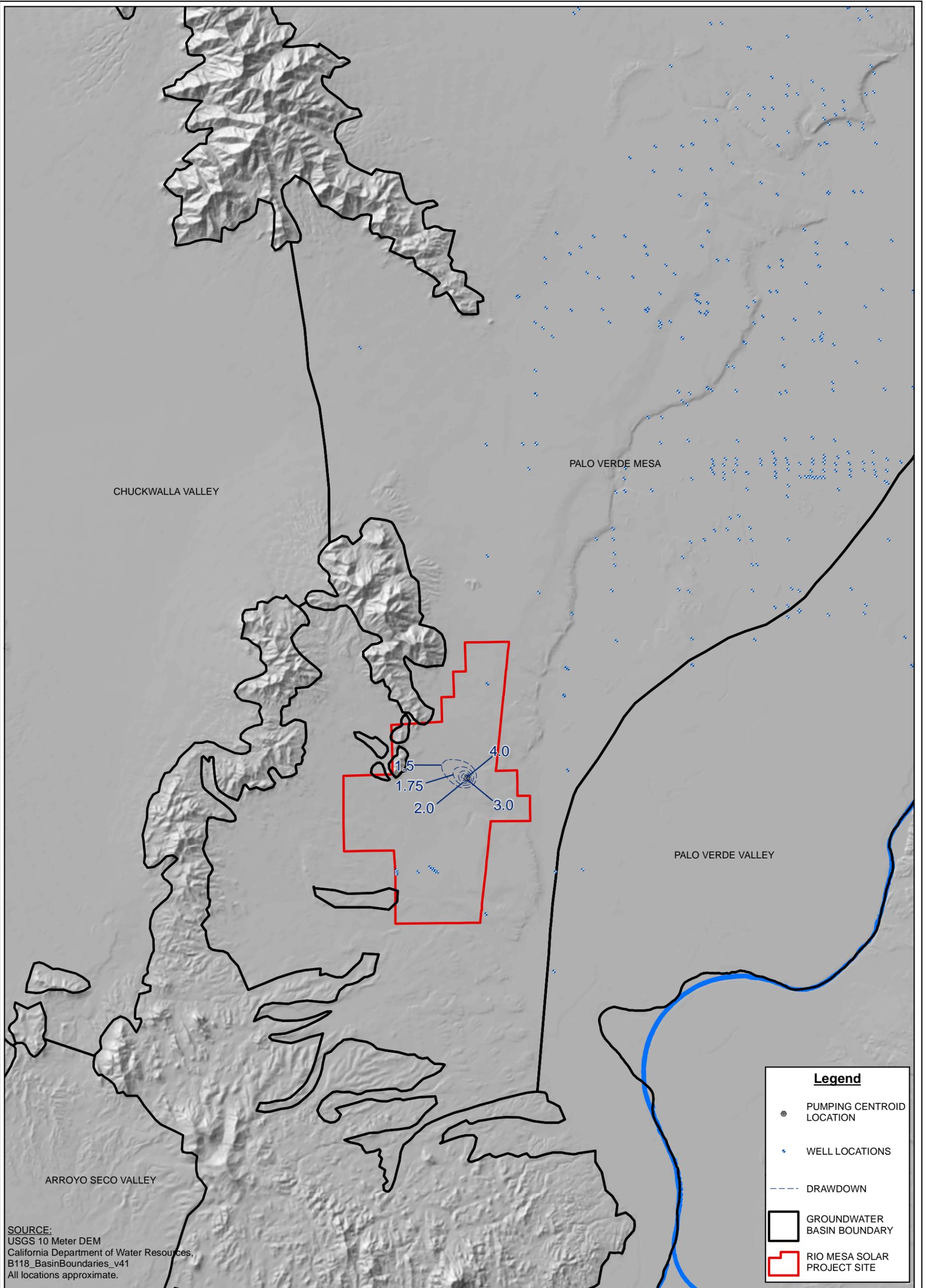
LEGEND

- Pumping Centroid Location
- Proposed Monitoring Well Location

SOURCE: Image courtesy of USGS ' 2012 Microsoft Corporation . Bechtel Power Corp. 25755-000-C2-0000-00001A.dwg



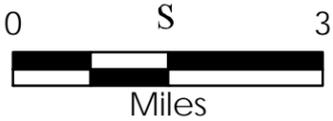
RIO MESA SOLAR POWER PROJECT		WorleyParsons resources & energy	
PROPOSED PUMPING CENTER LOCATION		SWL	MT
		8/2012	
		308038-03598	1



SOURCE:
 USGS 10 Meter DEM
 California Department of Water Resources,
 B118_BasinBoundaries_v41
 All locations approximate.

Legend

- PUMPING CENTROID LOCATION
- WELL LOCATIONS
- DRAWDOWN
- GROUNDWATER BASIN BOUNDARY
- ▭ RIO MESA SOLAR PROJECT SITE



RIO MESA SOLAR
 POWER PROJECT

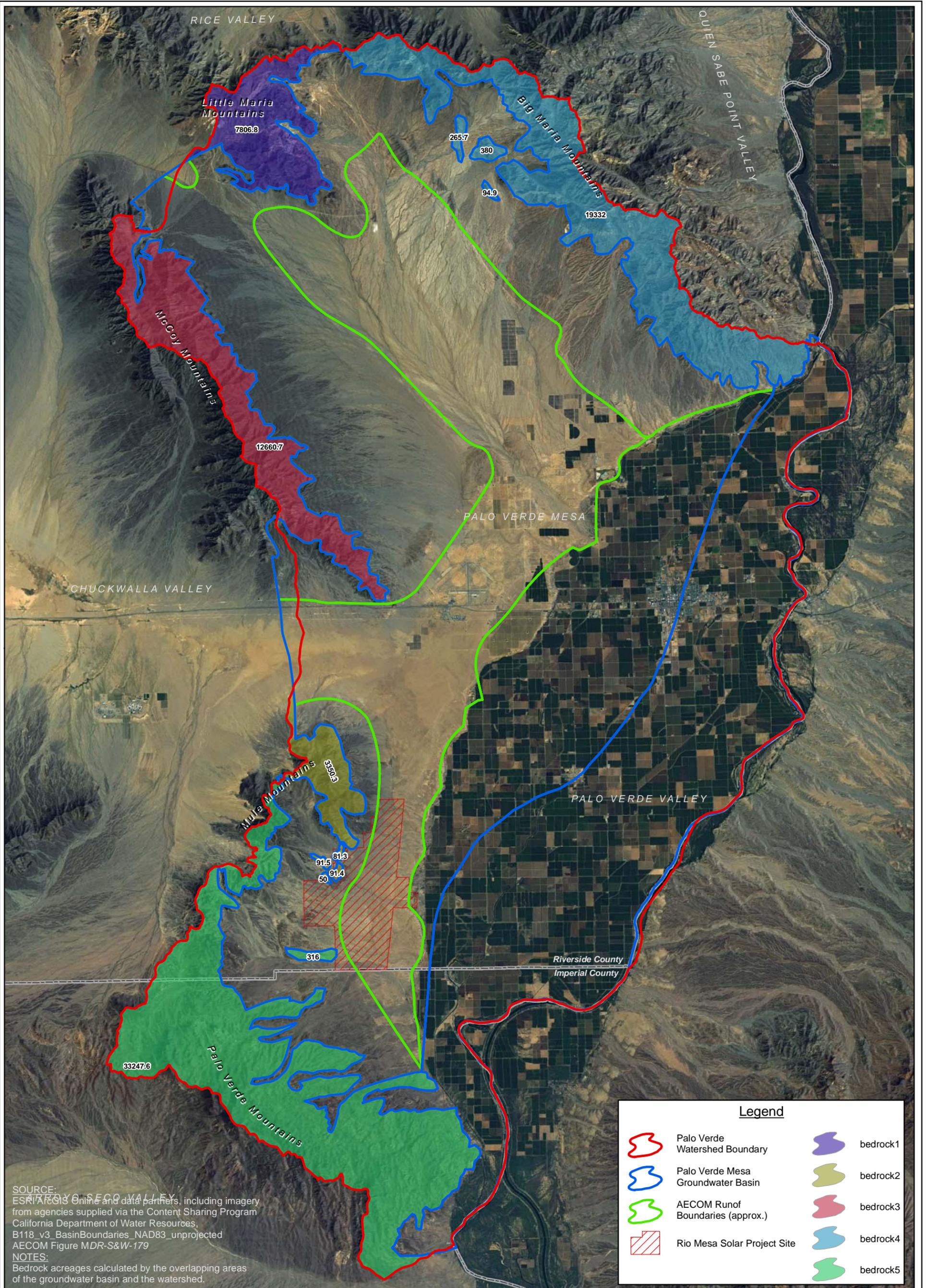


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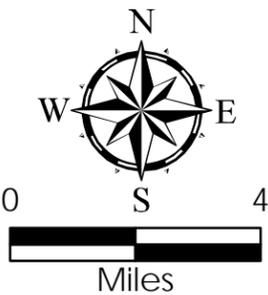
**DRAWDOWN CONTOUR MAP
 YEAR 31 AT END OF RMS PUMPING**

SWL MT 8/2012

308038-03598



SOURCE:
 ESRI/AECOM Online and data partners, including imagery
 from agencies supplied via the Content Sharing Program
 California Department of Water Resources,
 B118_v3_BasinBoundaries_NAD83_unprojected
 AECOM Figure MDR-S&W-179
 NOTES:
 Bedrock acreages calculated by the overlapping areas
 of the groundwater basin and the watershed.



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 POWER PROJECT



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**DISTRIBUTION OF RUNOFF
 TYPES AND AREAS**

SWL MT 9/2011

308038-03598

6-2



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Appendix A

modflow.err

===== TRANSLATION TO MODFLOW2000 =====

>>>> Testing Layer Elevations <<<<<
0 ERRORS, 0 WARNINGS

>>>> Translating LAYER-PROPERTY-FLOW Package <<<<<

Warning -- When using the MODFLOW2000 LPF Package, be sure that S in the GV database represents Specific Storage
This is different from the MODFLOW BCF Package where Storage is defined.

>>>> Translating RIVER Package <<<<<

>>>> Translating DRAIN Package <<<<<

>>>> Translating WELL 1 Package <<<<<

>>>> Translating RECHARGE Package <<<<<

>>>> Translating EVAPOTRANSPIRATION Package <<<<<

>>>> Translating BASIC Package <<<<<
0 ERRORS, 0 WARNINGS

>>>> Translating Discretization Package <<<<<

WARNING -- Transition from column 81 to 82 violates 50 percent convention

WARNING -- Transition from column 83 to 82 violates 50 percent convention

WARNING -- Transition from column 130 to 131 violates 50 percent convention
0 ERRORS, 3 WARNINGS

===== TRANSLATION COMPLETE! =====



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Attachment C



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Attachment A

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===== TRANSLATION TO MODFLOW2000 =====

>>>> Testing Layer Elevations <<<<<
0 ERRORS, 0 WARNINGS

>>>> Translating LAYER-PROPERTY-FLOW Package <<<<<

Warning -- When using the MODFLOW2000 LPF Package, be sure that S in the GV
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This is different from the MODFLOW BCF Package where Storage is defined.

>>>> Translating RIVER Package <<<<<

>>>> Translating DRAIN Package <<<<<

>>>> Translating WELL 1 Package <<<<<

>>>> Translating RECHARGE Package <<<<<

>>>> Translating EVAPOTRANSPIRATION Package <<<<<

>>>> Translating BASIC Package <<<<<
0 ERRORS, 0 WARNINGS

>>>> Translating Discretization Package <<<<<

WARNING -- Transition from column 81 to 82 violates 50 percent convention

WARNING -- Transition from column 83 to 82 violates 50 percent convention

WARNING -- Transition from column 130 to 131 violates 50 percent convention
0 ERRORS, 3 WARNINGS

===== TRANSLATION COMPLETE! =====

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

**Applicant's General Comments and Comments to Conditions of Certification
on the Preliminary Staff Assessment**

SOIL AND SURFACE WATER

GENERAL COMMENTS

1. Applicant submitted a preliminary construction Stormwater Pollution Prevention Plan (SWPPP) and Drainage Erosion and Sediment Control Plan (DESCP) as part of Data Response Set 1A, Attachments DR 80-1 and 80-2 that identified practices that would be used on the project site to manage storm water erosion and sedimentation. This should be referenced and included in the PSA. In addition, Applicant has recently completed a revision to the SWPPP and DESCP to reflect the two-unit project described in Applicant's Environmental Enhancement Proposal. The revised documents are attached to these comments.
2. Applicant is submitting a Revised Preliminary Jurisdictional Delineation for Waters of the United States as Appendix Soil and Surface Water 2.

FINDINGS OF FACT

No findings of fact are included in the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

1. **Page 4.10-32, DRAINAGE EROSION AND SEDIMENTATION CONTROL PLAN:** Please revise Condition of Certification Soil & Surface Water-1 as follows:

Soil & Surface Water-1: Prior to site mobilization, the project owner shall obtain the compliance project manager's (CPM) approval for a site specific DESCP 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.

Verification: The project owner shall complete all engineering plans, reports, and documents necessary for the CPM 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:

SOIL AND SURFACE WATER

- **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 DESC shall include the following elements:
 - a. **Topography.** Topography for off-site areas is 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 on-site ephemeral washes, drainage ditches, and tie-ins to the existing topography. A clear indication of on-site storm water containment features (berm, etc.) should also be delineated.
 - c. **Hydrology.** Existing and proposed hydrologic calculations for on-site areas and off-site 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 on-site drainage network, diversion facilities and BMPs.
 - e. ~~Containment. Description of on site storm water containment features. Indicate how the project will maintain a "no discharge" status.~~
- **Watercourses and Critical Areas:** The DESC shall show the location of all on-site 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 and areas to be preserved. 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 DESC 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 AND SURFACE WATER

- **Soil Wind and Water Erosion Control:** The plan shall describe 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 the CPM prior to use.
- **Project Schedule:** The DESCP 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). BMP implementation schedules shall be provided for each project element for each phase of construction.
- **Best Management Practices:** The DESCP 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 DESCP shall include copies of recommendations from the Riverside County and CRB RWQCB.
- **Monitoring Plan:** Monitoring activities shall include routine measurement of the volume of accumulated sediment in the on-site containment berms, drainage ditches, and storm water diversions.

~~Verification:~~ The DESCP shall be consistent with the grading and drainage plan as required by Condition of Certification **CIVIL-1**, and relevant portions of the DESCP shall be submitted to the Chief Building Official (CBO) for review and approval. The DESCP may be combined with the construction SWPPP. In addition, the project owner shall do all of the following:

1. No later than sixty (60) days prior to start of site mobilization, the project owner shall submit a copy of the DESCP to Riverside County and the CRB RWQCB for review and comment and to the CPM for review and approval. The CPM shall consider comments received from Riverside County and CRB RWQCB and approve the DESCP based on comments as appropriate.
2. 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.

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3. Once operational, the project owner shall provide in the annual compliance report information on the results of storm water BMP monitoring and maintenance activities. ~~The project owner shall also indicate what maintenance activities were completed.~~ Provide the CPM with two (2) copies each of all monitoring or compliance reports.
2. **Page 4.10-35, CONSTRUCTION – NPDES GENERAL PERMIT (SOLAR PLANT I & II):** Please revise the verification language of SOIL & SURFACE WATER-2 as follows:

Verification: Thirty (30) days prior to site mobilization, the project owner shall submit the construction SWPPP to the CBO and CPM for approval. A copy of the approved construction SWPPP shall be kept accessible onsite at all times. The DESC P may be combined with the construction SWPPP.

3. **Page 4.10-35, STORM WATER DAMAGE MONITORING AND RESPONSE PLAN:** Please revise Soil & Surface Water-4 as follows:

Soil & Surface Water-4: The project owner shall ensure that the heliostats are designed and installed to withstand storm water scour 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 storm water modeling performed by the applicant. The modeling will be completed using methodology and assumptions approved by the CPM.

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.

The basis for determination of pylon embedment depths shall employ a step-by-step process as identified below and approved by the CPM:

- A. Determination of peak storm water flow within each sub-watershed from a 100-year event:
 - Use of Riverside County Hydrology Manual to specify hydrologic parameters to use in calculations; and
 - HEC -1 and Flo-2D models shall 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 Riverside County.
- B. Determination of potential total pylon scour depth:
 - Potential channel erosion depths shall be determined using the calculated design flows, as determined in A above, combined with the ~~methodology~~

SOIL AND SURFACE WATER

presented in “FAN, An Alluvial Fan Flooding Computer Program, FEMA, 1990.” Flo-2D model results.

- Potential local scour shall 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.”
- C. The results of the scour depth calculations and pylon stability testing shall be used to determine the minimum necessary pylon embedment depth within the active channels. 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.
- 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 CPM for review and approval sixty (60) days before the start of heliostat installation.

The Storm Water Damage Monitoring and Response Plan shall be submitted to the CPM for review and approval and shall include the following:

- 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 shall 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 downstream 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 resulting in rainfall of 10mm or more within a 24-hour period as measured at or within 1 mile of the Project site:

- Security and Tortoise Exclusion Fence: Inspect for damage and buildup of sediment or debris

SOIL AND SURFACE WATER

- 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.
- ~~Downstream 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 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 project boundaries. For activities outside of the project boundaries the owner shall ensure all appropriate environmental review and approval has been completed before field activities begin.

Verification: At least sixty (60) days prior to ~~construction~~ installation of the pylons, the project owner shall submit to the CPM a copy of the Pylon Insertion Depth and Heliostat Stability Report for review and approval. At least sixty (60) days prior to commercial operation, the project owner shall submit to the CPM a copy of the Storm Water Damage Monitoring and Response Plan for review and approval. The project owner shall retain a copy of this plan onsite at the power plant at all times. ~~The project owner shall~~

SOIL AND SURFACE WATER

~~prepare an annual summary of the number of heliostats failed, cause of the failure, and cleanup and mitigation performed for each failed heliostat.~~

Appendix Soil and Surface Water 1

Provided on CD

Appendix Soil and Surface Water 2



BrightSource

October 8, 2012

James E. Mace
Senior Project Manager
Regulatory Division
U.S. Army Corps of Engineers
Los Angeles District
U.S. Army Corps of Engineers
Riverside Regulatory Field Office
1451 Research Park Drive, Suite 100
Riverside, CA 92507-2154

Subject: Revised Rio Mesa SEGF Preliminary Jurisdictional Determination Report

Mr. Mace,

BrightSource Energy is pleased to submit the enclosed Rio Mesa Solar Electric Generating Facility Preliminary Jurisdictional Determination Report. The report provides documentation of field investigations that were performed subsequent to the prior studies that utilized remote testing techniques.

We look forward to cooperating with the Army Corps of Engineers on this project. If you have questions or require further information please do not hesitate to contact me at (510)-410-3211.

Regards,

Marc Sydnor
Director – Environmental Affairs
BrightSource Energy, Inc.

Revised Preliminary Jurisdictional Determination Report

Rio Mesa Solar Power Generating Facility Riverside County, California

Prepared For:

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October 5, 2012



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1.0 INTRODUCTION AND PURPOSE

On behalf of BrightSource Energy Inc. (BrightSource), WRA, Inc. (WRA) has prepared this report containing additional information on the United States Army Corps of Engineers (Corps) preliminary jurisdictional determination (PJD; Corps File #SPL-2011-0972-JEM) of wetlands and Waters of the U.S. (WoUS) found within the Rio Mesa Solar Electric Generating Facility Project (Project Area). The original wetland delineation for the Project Area was performed by URS Americas, Inc. (URS). URS performed the initial delineation from the desktop using aerial photography interpretation with limited field verification (URS 2012; URS Personal Comm. 2012). Additionally, no on-site data were collected for WoUS using ordinary high water mark (OHWM) methods outlined by the Corps nor were detailed site investigations conducted using the Corps Arid West Regional Supplement (Corps 2008) for wetlands.

WRA submits this additional delineation information to inform a refined PJD process which will accurately capture the location and extent of WoUS in the Project Area.

A field analysis was conducted from September 24 to 28, 2012. This survey was conducted during a normal rainfall year. A significant storm event occurred on August 16, 2012.

1.1 Purpose of providing additional information

This additional information is being submitted to refine the previously mapped WoUS in the Project Area, as the previous desktop analysis was conducted using aerial imagery without field confirmation of the presence of indicators of OHWM nor detailed field investigation on the extent of any wetlands.

1.1.1 Following guidance issued by the Corps on wetland determinations

The additional information provided herein for wetlands follows the methods outlined in *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0* (Corps 2008). Data was recorded on standard Corps delineation data forms which are provided in Appendix B.

1.1.2 Using guidance on determination of OHWM in the arid west

Dry and ephemeral washes throughout the Project Area were examined using the methods outlined in the *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region* (Lichvar and McColley 2008) and *Updated Datasheet for the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* (Curtis and Lichvar 2010). Data was recorded on standard Corps OHWM forms which are provided in Appendix B.

1.2 Previous Corps Submittal

Original delineation information for the Project Area was submitted to the Corps in a January 2012 letter report from URS (URS 2012). This letter report described URS delineation

methodology and presented their findings on total acreages of wetlands and WoUS in the Project Area with an associated map depicting the location and extent of wetlands and waters features.

URS identified a total of 1,178.78 acres of potentially jurisdictional wetlands and WoUS in the Project Area. An additional 254.82 acres of potentially jurisdictional wetlands and WoUS was mapped outside of the Project Area in an associated Biological Study Area (BSA) that was examined as part of their delineation. See URS letter report (provided in Appendix C), containing tables of potentially jurisdictional acreages and associated maps, for additional information on their delineation methods and results.

2.0 EXISTING CONDITIONS

2.1 Location and Setting

The Project Area is located on the Palo Verde Mesa, primarily on land owned by the Metropolitan Water District of Southern California (MWD). A portion of the Project Area is located on lands administered by the Bureau of Land Management (BLM), all within Riverside County. The Project Area is approximately two miles west of the town of Palo Verde, California and State Route 78 (Figures 1, 2). The Project Area is located on the Thumb Peak U.S. Geologic Survey (USGS) 7.5-minute quadrangle map (USGS 1983, Figure 3). The Project Area is currently undeveloped and surrounded by undeveloped land to the north, south, and west with agricultural lands located to the east. The site is comprised primarily of creosote desert scrub with areas of desert wash scrub within the onsite washes. Portions of the site are disturbed due to existing infrastructure (transmission lines, pipelines, past military training activities, etc.).

The Project Fenceline describes the area of project activities including solar generating towers, heliostats and heliostat accessways, roads, substation, and other related development.

2.2 Soils

The United States Department of Agriculture (USDA) Soil Survey of the Palo Verde Area, California (USDA 1974) indicates that six native soil map units are present in the eastern portion of the Project Area in the vicinity of the mapped wetlands: Badlands, Carrizo gravelly sand, Duneland, Gilman fine sandy loam, Orita gravelly fine sandy loam and Rositas fine sand, 0 to 2 percent slopes. None of these soil types are considered hydric by federal, state, or local hydric soils lists (USDA 2012). These soil types are described in more detail below. Soils in the western portion of the Project Area have not been described by a USDA soil survey. Soils within the eastern portion of the Project Area are shown on Figure 4.

Badland. Badland slopes range from 9 to 75 percent. Vegetation is sparse or lacking except for short periods after rains. Runoff is rapid, and the hazard for erosion is high.

Carrizo gravelly sand. The Carrizo series consists of very deep, excessively drained soils formed in mixed igneous alluvium. Carrizo soils are on numerous landforms on flood plains, fan piedmonts and bolson floors. Slopes range from 0 to 15 percent. The soil surface is covered by approximately 70 percent gravel. A representative profile for Carrizo gravelly sand is 0-2 inches; pale brown (10YR 6/3) extremely gravelly sand, brown (10YR 4/3) moist; 2-60 inches; pale brown (10YR 6/3) stratified extremely gravelly and very gravelly coarse sand, brown (10YR 4/3) moist. Available water capacity is between 2.5 and 3.5 inches and permeability is rapid. This soil unit is slightly saline with limited potential for erosion.

Duneland. The Duneland series consists of fine sand hills that have a slope of 9 to 20 percent, where dunes have recently stabilized or are being slowly drifted by wind.

Gilman fine sandy loam. The Gilman series consists of very deep, well drained soils that formed in stratified stream alluvium. Gilman soils are on flood plains and alluvial fans and have slopes of 0 to 3 percent. A representative profile for Gilman fine sandy loam is 0-3 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; 13-28 inches; 13 to 28 inches; pale brown (10YR 6/3) stratified very fine sandy loam, brown (10YR 4/3) moist; 28-60 inches; brown (10YR 5/3) stratified very fine sandy loam, brown (10YR 4/3) moist. The available water capacity is between 5 and 6 inches and permeability is moderately rapid to rapid. Runoff is slight with little to no potential for erosion. This soil unit is nonsaline.

Orita gravelly fine sandy loam. The Orita series consist of very deep, well drained soils that formed in alluvium from mixed sources. Orita soils are on fan remnants and terraces. Slopes are 0 to 2 percent. The soil surface is covered with a continuous pavement of fine gravel of leucogranite and some schist and quartz; some gravel are weakly varnished by dark coatings, some by calcium carbonate. A representative profile is 0 to 4 inches; light brown (7.5YR 6/4) gravelly fine sandy loam, brown (7.5YR 4/4) moist; 4 to 10 inches; light brown (7.5YR 6/4) gravelly sand, brown (7.5YR 5/4) moist; 10 to 22 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 4/4) moist; 22 to 42 inches; reddish yellow (5YR 6/6) gravelly clay loam, yellowish red (5YR 4/6) moist; 42 to 60 inches; light reddish brown (5YR 6/4) gravelly clay loam, reddish brown (5YR 4/4) moist; 60 to 68 inches; reddish yellow (5YR 7/6) gravelly clay loam, yellowish red (5YR 4/6) moist; 68 to 80 inches; light brown (7.5YR 6/4) gravelly fine sandy loam, brown (7.5YR 5/4) moist.

Rositas fine sand, 0 to 2 percent slopes. The Rositas series consists of very deep, somewhat excessively drained soils formed in sandy eolian material. Rositas soils are on dunes and sand sheets. Slope ranges from 0 to 30 percent with hummocky or dune micro relief. A representative profile for Rositas fine sand is 0 to 9 inches; reddish yellow (7.5YR 7/6) fine sand, strong brown (7.5YR 5/6) moist; 9 to 60 inches; reddish yellow (7.5YR 7/6) fine sand, strong brown (7.5YR 5/6) moist. Available water capacity is 3.5 to 4.5 inches and permeability is rapid. The potential for erosion is slight to moderate, and this unit is slightly saline to nonsaline.

2.3 Hydrology and Precipitation

Local and Regional Flow Patterns

The eastern portion of the Project Area, east of the Rio Mesa, was historically situated within the floodplain of the Colorado River. The primary hydrological sources in this area include surface runoff from adjacent mesa lands to the west during precipitation events, and to a lesser extent, direct precipitation. Flows from the mesa lands to the west collect in a large, dry wash feature ("Wash 25B" [VTN 2011]), within the central portion of the Project Area. This wash transport flows east and down gradient towards the historic floodplain of the Colorado River in the far eastern portion of the Project Area.

Hydrologic/hydraulic Analysis

A hydrologic and hydraulic analysis has been performed within the Project Area (VTN 2011). The large dry wash feature referenced above ("Wash 25B") is the third largest wash system present in the Project Area, with a contributing basin size of approximately 2.6 square miles within the Project Area. Two- and five-year event flows within this wash are 25 and 89 cubic feet per second (cfs), respectively. This wash system flows into the eastern portion of the Project Area, eventually discharging into the vicinity of the mapped wetlands described in this section.

Precipitation Analysis

Annual rainfall amounts in the Colorado River Hydrologic Region range from less than 3 to approximately 6 inches. Most of the precipitation for the region occurs in the winter and spring. However, monsoonal thunderstorms, created by the movement of subtropical air from the south, do occur in the summer and have generated significant rainfall in some years. Table 1 compares the total monthly precipitation received in Blythe (Blythe Northeast Station) with long-term (30-year record) monthly averages for this region (USDA 1995). These weather stations are located approximately 11-15 miles northeast of the center of the Project Area. Table 1 also shows total monthly precipitation received at the Palo Verde II Station, which is located approximately three miles southeast of the center of the Project Area. No long term data is available for the Palo Verde II station, though precipitation recorded at this station may more closely correlate to precipitation received within the Project Area due to local relief and rain shadowing effects.

Total recorded precipitation for the 2012 water year (October 2011 through October 2012) was 2.72 at the Blythe NE station and 2.63 inches at the Palo Verde II station (UCANR 2012). These values are below the long-term yearly average of 3.91 inches at the Blythe Airport station; however, both values fall within the long term normal range of 2.55 to 4.48 inches (USDA 1995). A recent significant precipitation event occurred in the Project Area vicinity on August 16, 2012, when 0.5 inches of rainfall were recorded at Blythe NE station and 0.39 inches were recorded at Palo Verde II station.

Table 1. Regional Precipitation Compared to Monthly and Annual Averages

Month (Year)	Monthly Totals: Palo Verde II Station (in)	Monthly Totals: Blythe NE Station (in)	Long-term Averages (Blythe Airport Station)		
			Average (in)	30 Percent Chance of:	
				less than (in)	more than (in)
October 2011	0	0.01	0.27	0.0	0.27
November 2011	0.15	0.59	0.23	0.0	0.22
December 2011	0.18	0.4	0.51	0.0	0.51
January 2012	0	0	0.50	0.09	0.59
February 2012	0	0	0.53	0.0	0.60
March 2012	0.32	0.33	0.28	0.2	0.35
April 2012	0.09	0.15	0.11	0.0	0.0
May 2012	0	0	0.05	0.0	0.0
June 2012	0	0	0.04	0.0	0.0
July 2012	1.35	0.3	0.19	0.0	0.21
August 2012	0.45	0.89	0.65	0.03	0.67
September 2012	0.09	0.05	0.55	0.0	0.62
Total	2.63	2.72	3.91	2.55	4.48

2.4 Vegetation

Vegetation communities within the Project Area are described based on vegetation alliance descriptions in the Manual of California Vegetation, Second Edition (Sawyer et al. 2009) and vegetation community classifications given in the Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986). Vegetation communities were identified by URS as part of previous Project Area biological investigations (URS 2011) and are included in this section for reference. Plant names given within this report follow Baldwin et al. (2012), with those from Hickman (1993) noted in brackets if applicable. Wetland indicator status follows the Corps 2012 Arid West Draft Final Ratings (USACE 2012).

Blue Palo Verde – Ironwood Woodland Alliance. Blue palo verde – ironwood woodland occurs on the margins of desert arroyos, seasonal watercourses and washes, bottomlands, middle and upper bajadas and alluvial fans. Soils are often sandy and well-drained, and derived from alluvium or colluvium. Blue palo verde – ironwood woodland occurs throughout the Colorado Desert (Sawyer et al. 2009). In the Project Area this woodland community is generally restricted to washes, where it grows at the edge of the active floodplain. Blue palo verde (*Parkinsonia florida* [*Cercidium floridum*], FAC) and ironwood (*Olneya tesota*, NL) are the dominant trees. Associated species include creosote bush (*Larrea tridentata*, NL), white bursage (*Ambrosia dumosa*, NL), indigobush (*Psoralea arborescens*, FACU), cheesebush (*Ambrosia* [*Hymenoclea*] *salsola*, NL), spiderling (*Boerhavia* sp., FACU-NL), chinchweed (*Pectis papposa*, NL), big galleta grass (*Hilaria* [*Pleuraphis*] *rigida*, NL) and sixweeks gramma (*Bouteloua barbata*, NL).

Mesquite Bosque Woodland Alliance. Mesquite bosque occurs on the fringes of playa lakes, river terraces, stream banks, floodplains, rarely-flooded margins of arroyos and washes, and sand dunes. Mesquite bosque occurs throughout California's southeastern deserts and in the southern San Joaquin Valley (Sawyer et al. 2009). This community does not occur in and around large perennial streams with high hydrologic input, but rather in drier areas with substantial near-surface groundwater supplies. Honey mesquite (*Prosopis glandulosa*, NL) dominated mesquite bosque in the Project Area, and common associated taxa include white bursage, bush seepweed (*Suaeda nigra* [*S. moquinii*], allscale (*Atriplex polycarpa*, FACU) and spiderling.

Creosote Bush Scrub Shrubland Alliance. Creosote bush scrub occurs in alluvial fans, bajadas, upland slopes, minor intermittent washes, and on desert pavement across California's southeastern deserts (Sawyer et al. 2009). Creosote bush scrub typically occurs on well-drained secondary soils rather than thin, residual upland soils or areas with high salinity. In the Sonoran Desert, creosote bush scrub is common on desert pavement. This community is dominated by creosote bush, but other common associates include ocotillo (*Fouquieria splendens*, NL), white bursage, brittlebush (*Encelia farinosa*, NL), *Cylindropuntia* [*Opuntia*] *ramosissima*, NL).

Bush Seepweed Scrub Shrubland Alliance. Bush seepweed scrub occurs on flat to gently sloping valley bottoms, playas, toe slopes adjacent to alluvial fans, and in bajadas, where soils are deep, saline or alkaline. Bush seepweed scrub occurs across California's southeastern deserts, and in the Central Coast Ranges, the Southern Mountains and Valleys, the San Joaquin Valley, and in the Northwestern Basin and Range. However, the alliance is restricted primarily to alkaline substrates in desert and semi-desert habitats (Sawyer et al. 2009). Stands were generally monotypic in the Project Area, though associated taxa at the edge of stands included allscale, honey mesquite and spiderling.

Desert Saltbush Scrub (*Atriplex polycarpa*) Shrubland Alliance. Desert saltbush scrub occurs in washes, playa lake beds and shores, and other areas with poorly drained, finely textured alkaline soils, throughout the Colorado, Mojave and Great Basin deserts. This community is composed of low, grayish microphyllous shrubs, generally dominated by one species of *Atriplex* (Sawyer et al. 2009, Holland 1986). Total cover is often low with much bare

ground between widely spaced shrubs. Allscale is the dominant species within saltbush scrub in the Project Area. Other species observed in this community include bush seepweed and honey mesquite.

3.0 WETLANDS

This section describes the basis for the original determination on potential jurisdictional wetland areas within the Project Area contained in the original URS delineation (URS 2012). This section also contains background information that WRA considered preparing this updated delineation report, including existing soils, hydrology and vegetation conditions.

3.1 Basis for Original Determination

Presence of NWI Polygon in the Project Area

A query of the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map (USFWS 2010) shows that one wetland feature is located within the Project Area (Figure 5). This feature is a freshwater, intermittently flooded, palustrine wetland dominated by broad-leaved, deciduous scrub (NWI Code PSS1J).

3.2 Background Information

3.2.1 Wetland delineation methodology

Previous delineation report

The original letter report used remote sensing techniques to map the extent of the wetland feature indicated on the NWI map, relying primarily on aerial photograph interpretation. The extent of the wetland was based on an assumption that the feature on the NWI map was applicable throughout the entire eastern face of the mesa lands within the Project Area. Prior to the fieldwork described in this report, no verification of the aerial imagery used to map the wetland was completed in this area. Additionally, no data describing wetland or surrounding upland conditions in this area were collected on standard Corps Arid West data forms.

WRA delineation report

WRA followed guidance in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0* (Corps 2008) to delineate wetlands within the Project Area. Data was recorded on standard Corps delineation data forms which are provided in Appendix B.

3.3 Results

Potentially jurisdictional Section 404 wetlands are summarized in Table 2 and depicted in Figure

6. Standard Corps Arid West wetland delineation data forms are included in Appendix B. Photographs of representative portions of the Project Area are presented in Appendix D.

3.3.1 *Potential Section 404 Waters of the U.S.*

No wetlands are located within the Project Fenceline. Approximately 2.36 acres of bush seepweed seasonal wetland was mapped in the eastern portion of the Project Area, outside of the Project Fenceline (Figure 6), in topographically low areas that collect runoff from the adjacent mesa lands to the west.

Vegetation in these wetlands was comprised entirely of bush seepweed (*Suaeda nigra* [S. *moquinii*], OBL). Notably, approximately 40-60 percent of bush seepweed appeared dead or dying, possibly indicating drying conditions within the wetlands. Upland areas lacked indicators of wetland hydrology and were not dominated by bush seepweed, but were dominated by allscale (*Atriplex polycarpa*, FACU). Because soils in the wetland lacked hydric soil indicators (see discussion below), areas dominated by bush seepweed but without wetland hydrology indicators were determined to be uplands, and the boundary of the wetland was thusly delineated.

Multiple primary indicators of wetland hydrology were observed in the mapped wetland, including surface soil cracks, salt crusts, and sediment deposits. The wetland appears to receive and collect flows from the large dry wash to the west (Wash 25B).

Hydric soil indicators were not observed in the mapped wetland areas. However, due to the presence of dominant hydrophytic vegetation, and multiple primary indicators of wetland hydrology, soils in these areas were determined to be problematic and considered hydric. Detailed rationale for this is described in the following section.

3.3.2 *Difficult situations in the Arid West (problematic areas)*

The Arid West Supplement (Corps 2008) includes procedures for identifying wetlands that may lack indicators due to natural processes. These “problem area” wetlands are defined as naturally occurring wetland types that periodically lack indicators of hydrophytic vegetation, hydric soil, or wetland hydrology due to normal seasonal or annual variability. Some problem area wetlands may permanently lack certain indicators due to the nature of the soils or plant species on the site. WRA interpreted the gathered data using best professional judgment and our knowledge of the ecology of the wetlands in the region to make the decisions presented in this section.

Problematic hydric soils

Indicators of hydric soils were not apparent within the mapped wetlands. At two sampled locations, faint or indistinct redoximorphic concentrations were observed within the soil matrix, but not of enough to be considered indicators of hydric soils. Soils were typically layered and may indicate that large amounts of sediment are transported into this area during significant precipitation events. The rate of soil deposition in this area may prevent development of

redoximorphic features in the soil profile. However, because the area was dominated by OBL-classified vegetation, and displayed multiple primary indicators of wetland hydrology, soils were assumed to be hydric.

Problematic vegetation

Bush seepweed is listed as an obligate wetland plant in the new 2012 National Wetland Plat List (Lichvar and Kartesz 2009). Obligate species occur in wetland areas greater than 99 percent of the time and are almost always considered hydrophytes. However, seepweed was also observed growing on upland soils with no apparent indicators of wetland hydrology.

Bush seepweed can occur in non-wetland areas in desert habitats, and its presence may be dictated by other habitat characteristics. The Flora of North America describes that:

Suaeda nigra exhibits much phenotypic plasticity, as well as genetic variability, and is wide-ranging. This combination has resulted in the naming of many variants that often reflect a response to localized or regional habitat conditions such as degree of wetness, salinity, or freezing temperatures (Hopkins and Blackwell 1977) (FNA 1993)

The Flora of North America additionally describes bush seepweed habitat as “Alkaline, saline, and gypseous places of the interior, mostly in deserts, occasionally coastal, rarely estuarine” (FNA 1993). From these descriptions and in-the-field observations, it is clear that bush seepweed is able to occupy a variety of habitats and its presence may be determined by other factors than moisture availability. The Manual of California Vegetation notes that bush seepweed “appears opportunistic in occupying roadsides and other recently disturbed areas” (Sawyer et al. 2009).

For these reasons, WRA considers bush seepweed-dominated communities which do not have additional indicators of wetland hydrology or hydric soils to be upland areas

4.0 “WATERS OF THE U.S.”: LARGE DRY WASHES

4.1 Description of Large Dry Washes

Four large dry wash systems traverse the Project Area from a west-to-east direction. The four large washes are described in detail in the project hydrologic analysis (VTN 2011), and summarized here:

- “Wash 45” – This is the largest of the washes and is located along the Project Area’s southern boundary.
- “Wash 30” – This wash is located approximately 0.75 mile north of Wash 45.
- “Wash 25B” – Located approximately 2.4 miles north of Wash 30.

- “Wash 0” – This wash traverses the Project Area’s northern boundary, and is located approximately 1.1 mile north of Wash 25B.

The large dry washes on the Project Area are compound channels as described in Lichvar and McColley (2008), where a complex mosaic of terraces are located within an active floodplain with frequently shifting low-flow channels. We used OHWM indicators as outlined in Corps guidance (Lichvar and McColley 2008) to delineate the ordinary high water mark of individual channels. Most often, these included mudcracks, crested ripples, benches, drift deposits, change in particle size distribution, and surface relief. The Corps guidance on ordinary high water mark in the arid west provides for separation of these systems into separate “waters” and terraces. WRA interpreted these systems based on hydrologic modeling, knowledge of recent storm events and rain gauge data, and experience working in similar dry wash systems in the Arid West.

4.2 Background Information

4.2.1 Large dry wash delineation methodology

Previous delineation report

The original delineation used remote sensing techniques exclusively to map these large dry wash systems, and not published guidance from the Corps (Lichvar and McColley 2008) for mapping the OHWM in dry wash systems in the Arid West. In doing so, the boundaries between active floodplain and terraces were not delineated. Instead, the wash boundaries were mapped as extending broadly across the entire system, overstating potential jurisdiction.

WRA delineation report

The methods used by WRA in this study to delineate the OHWM in large dry washes in the Project Area followed guidance described in the publication *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008) and the *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (“Updated Datasheet”, Curtis and Lichvar 2010). At least one Updated Datasheet was completed for each large wash system in the Project Area. Data collected on the Corps Updated Datasheet are presented in Appendix B.

Refinement of the previous delineation map began with a review of background resources. An office review of available resources including the previous delineation map (URS 2011), USGS 7.5-minute topographic maps (USGS 1983), soils maps (USDA 1974) and high-quality aerial imagery was conducted to determine the probable locations of WoUS within the Project Area. Recent rainfall data (UCANR 2012) as well as long-term climatic data (USDA 1995) were reviewed to determine if any significant rainfall events had occurred in the months preceding the field assessment. No stream gauge data is available for watercourses within the Project Area. Using GIS, potential areas of terrace floodplain within the large washes were digitized and loaded onto Trimble GeoXH handheld GPS units with submeter accuracy.

Fieldwork to verify OHWM extent followed the office remote assessment. Areas identified as potential terrace floodplain within the large washes were inspected to determine potential jurisdictional status. Transitional areas between the low-flow channels, active floodplains and terrace floodplains were determined, and OHWM indicators associated with the system were noted as per the procedures in Lichvar and McColley (2008). Once the boundaries between low-flow channels, active floodplains and terrace floodplains were identified, transects were conducted perpendicular to direction of flow at intervals in the large wash systems. Using GPS, the OHWM locations (i.e. between the active floodplain and terrace floodplain) were mapped in the field to help inform further digitization of the large wash systems using GIS.

At six locations throughout the Project Area, updated OHWM datasheets (Curtis and Lichvar 2010) were used to describe the wash system in detail.

Lichvar and McColley (2008) describe that low to moderate rainfall events in the 5- to 10-year recurrence size range may be necessary to engage the active floodplain in wash systems in the Arid West, and that the shifts in vegetative and textural signatures brought on by events of this size are generally used to identify the limits of the OHWM. Therefore, WRA examined hydrologic models (FLO-2D and HEC-RAS) prepared for the Project Area (VTN 2011). Models depicting the extent of 5- and 10-year recurrence events were examined and considered in making potential jurisdiction determinations.

4.3 Results

The large dry washes in the Project Area can be described as compound channels as described in Lichvar and McColley (2008), where a complex mosaic of terraces are located within an active floodplain with frequently shifting low-flow channels. Low-flow channels and active floodplains contained substrates of sand or gravel, and were generally devoid of vegetation. Terrace floodplains, located within the large wash systems but outside of potential jurisdiction, sometimes contained high-flow channels, which only receive and transport flows during extremely large precipitation events. Large wash systems are shown in Figure 6. The locations of the updated datasheet transects are shown on Figure 7.

Numerous geomorphic and vegetative indicators of OHWM described in Lichvar and McColley (2008) were observed in the large wash systems. These included, but are not limited to, mudcracks, low-flow channel dunes, gravel sheets and sediment sorting, cobble bars, benches, drift, and vegetation shifts. See Appendix D for photographs of indicators of OHWM observed in the Project Area.

Vegetation within large washes typically varied by geomorphic position within the system. Low-flow channels and active floodplains were often devoid of vegetation or contained only scattered annual herbs and young shrubs. On terraces, vegetation was more developed, and some terraces within large wash systems supported mature trees and shrubs including blue palo verde, ironwood, smoke tree (*Psoralea argophylla*, NL) water jacket (*Lycium andersonii*, NL), cheesebush, indigo bush, creosote bush, big galleta grass, trailing windmills (*Allionia incarnata*, NL), spiderling and chinchweed. Low terraces adjacent to the large wash systems

typically supported creosote bush shrubland, with associated species as described in Section 2 of this report.

5.0 “WATERS OF THE U.S.”: SMALL DRY WASHES

5.1 Description of Small Dry Washes

Aside from the four large wash systems, smaller, ephemeral dry washes traverse the Project Area, generally from west to east. Most of these washes are tributary to the larger systems described above.

5.2 Background Information

5.2.1 Small dry wash delineation methodology

Previous delineation

The original delineation used remote sensing techniques including aerial photo interpretation in mapping these small dry washes, and not published guidance from the Corps (Lichvar and McColley 2008) for mapping the OHWM in dry wash systems in the Arid West. In digitizing each individual small wash, the previous delineator assigned a width class to describe the width of the wash. For instance, any wash estimated to be between zero and three feet wide was assigned a width of three feet. Any wash estimated to be between three and six feet wide was assigned a width of six feet, and so on.

The previous delineation considered many relict or swale features to be potentially jurisdictional. Since these features do not have an ordinary high water mark, these features were removed from the updated delineation map, as described below.

WRA delineation

In order to accurately characterize the extent and width of ephemeral washes within the Project Area, the previous delineation data was loaded onto handheld Trimble GeoXH receivers with sub-meter accuracy. Linear transects perpendicular to the ephemeral drainages were established at intervals as shown on Figure 7. Transects were traversed on foot. Where a wash with an ordinary high water mark crossed the transect, data describing the actual wash width and characteristic vegetation present were recorded. Where a relict or swale feature was encountered, GPS data indicating lack of jurisdiction were recorded. Transect data were then exported into GIS, and data collected in the field were used to inform further mapping refinement in the office.

The previous delineation considered many relict or swale features to be potentially jurisdictional. Due to the shifting nature of these ephemeral systems, channels that previously carried ordinary flows can be completely abandoned. Indicators that may have been present from these historic flows can remain intact for many years in these relict features. Alternatively, swales are

features that may carry flows during high-flow (25-year or greater events), but normally do not transport flows during low to moderate (up to 10-year) events. The OHWM is generally poorly defined in these features due to the lack of regular flows. When relict features or swales were encountered during transects, the location was noted with GPS and the feature subsequently removed from the delineation map. In other cases, features were delineated based on aerial imagery that did not exist and were subsequently removed from the delineation.

5.3 Results

Aside from the four large wash systems, numerous smaller, ephemeral dry washes traverse the Project Area, generally from west to east (Figure 6). These washes range from small (one-half to one foot wide) to relatively broad (over 10 feet wide). These smaller washes are generally less complex than the larger systems, and usually lack compound channels containing active and terrace floodplains present in the large washes. Substrates of active channels range from sandy to gravelly. Larger cobbles and small boulders that are present in the larger systems are generally absent from these smaller features.

Vegetation within smaller washes typically varies by size of the wash and location within the active floodplain. Active low-flow channels were typically devoid of vegetation. Vegetation was generally concentrated outside of the active channel. Most small washes were located within creosote bush scrub. Typical vegetation included creosote bush, big galleta grass, trailing windmills, spiderling, and chinchweed,

Small wash widths

Because the previous delineation had used size classes to describe the width of small washes within the Project Area, all washes below a certain width threshold were automatically rounded up when potential jurisdiction was reported. WRA found that many of these widths were overstated. By reporting the actual average width of small washes the total acreage of small washes within the Project Area was reduced from what was reported in the previous delineation.

Due to size classes used in previous delineation many small wash widths were overstated. WRA subsequently narrowed many washes in the transect areas.

Small wash 'headwaters' areas

Wash 'headwaters' are located at the upper extent of OHWM in small washes, where flows are less and indicators of OHWM become less apparent. WRA found that indicators of OHWM in many wash headwaters areas were insufficient to define the area as a WoUS. The uppermost portions of such washes were determined to be non-jurisdictional and were removed from the delineation map.

6.0 SUMMARY OF RESULTS

The conclusions of this report are based on conditions observed at the time of the delineation conducted between September 20 and 24, 2012.

6.1 Summary of Potential Jurisdictional Areas

Based on the findings of the wetland delineation, the Project Area contains approximately 2.36 acres of potentially jurisdictional wetlands and 367.97 acres of potentially jurisdictional dry washes (Table 2), for a total of 370.33 acres of potential jurisdictional Waters of the U.S.

The Project Fenceline contains no potentially jurisdictional wetland areas and 144.66 acres of potentially jurisdictional dry washes (Table 2), for a total of 144.66 acres of potential jurisdictional Waters of the U.S.

Table 2. Summary of Potential Jurisdictional Areas within the Project Area and Project Fenceline

Potentially Jurisdictional Waters of the U.S.	Within the Project Area (acres)	Within the Project Fenceline (acres)
Wetlands	2.36 acres	0.00 acres
Dry Washes	367.97 acres	144.66 acres
Total	370.33 acres	144.66 acres

7.0 REFERENCES

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APPENDIX A
PROJECT FIGURES

Figure 1. Project Area Vicinity Map

Figure 2. Project Area Detail Map

Figure 3. USGS Map with Project Area

Figure 4. Project Area Soils Map

Figure 5. NWI Features within the Project Area

Figure 6. Potentially Jurisdictional Wetlands and “Waters of the U.S.” within the Project Area

Figure 7. Transect Locations: OHWM Datasheet Locations and Wash Transects

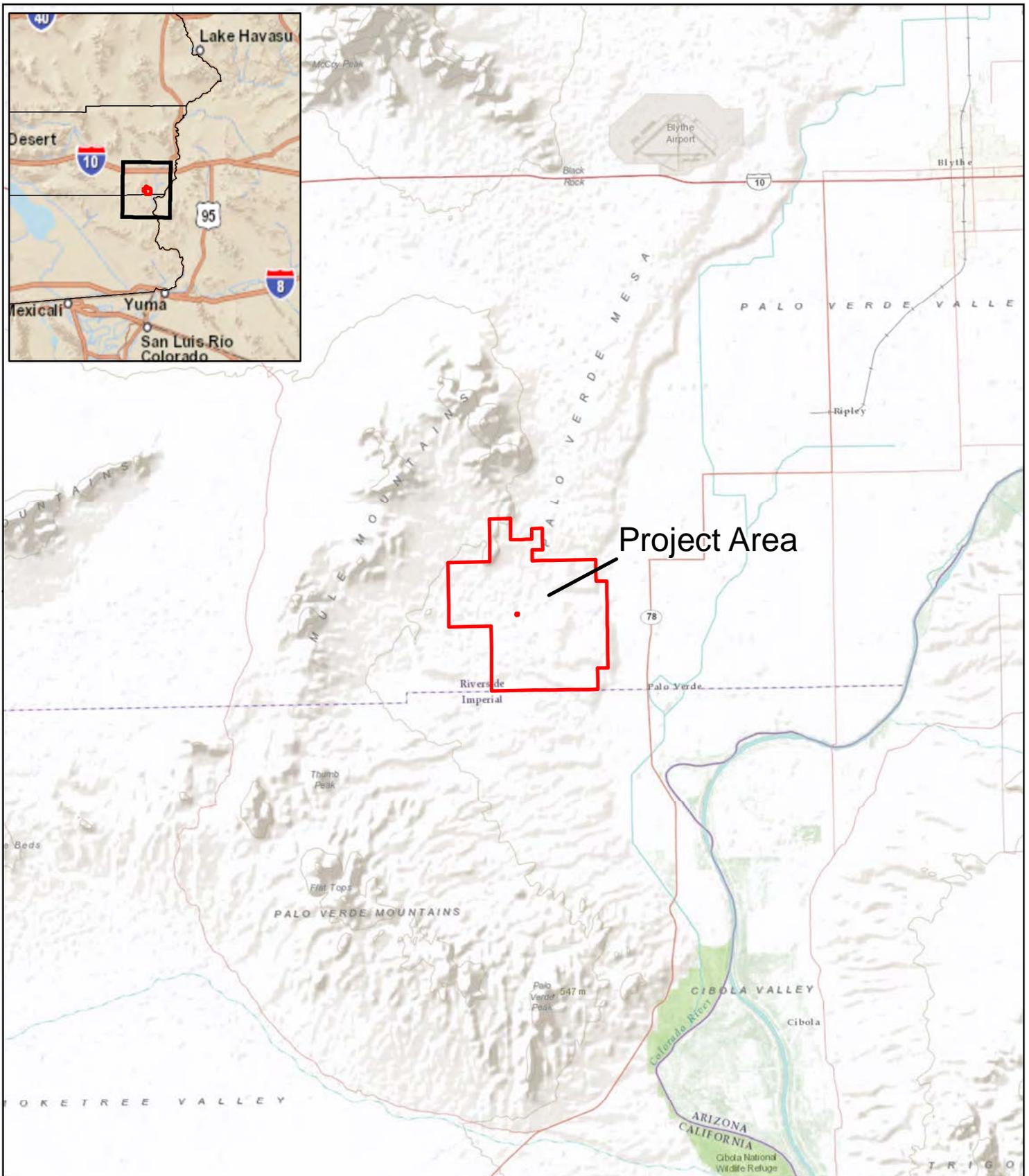
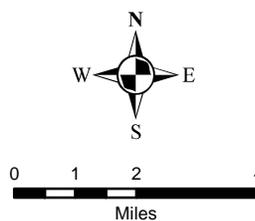


Figure 1. Project Area Vicinity Map

BrightSource Rio Mesa Site
 Blythe, California



Date: October 2012
 Map By: Sundaran Gillespie
 Basemap: ESRI World Topo

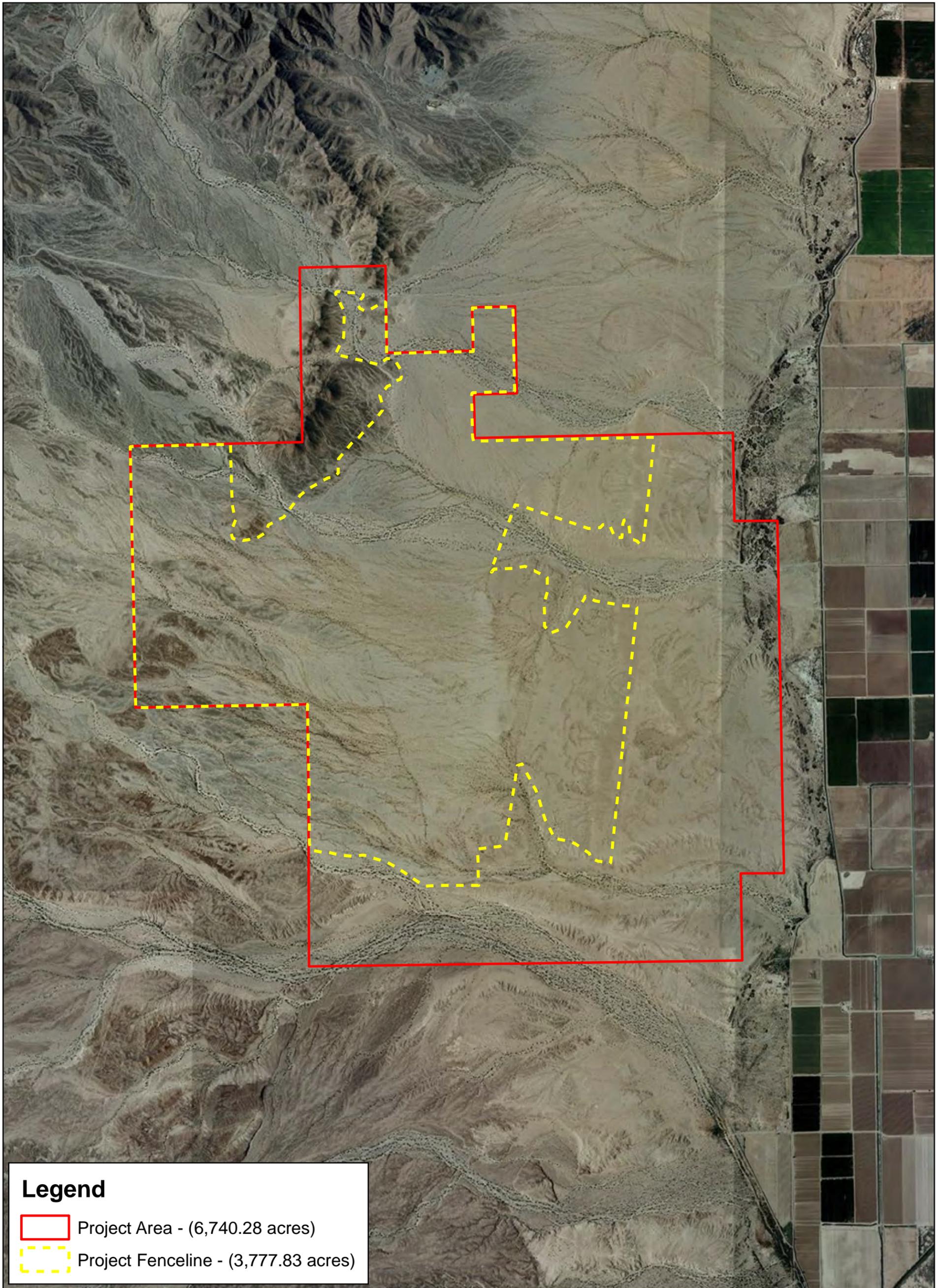
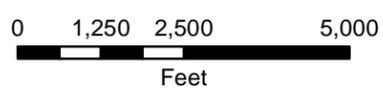


Figure 2. Aerial Site Map

BrightSource Rio Mesa Site
Blythe, California



Date: October 2012
Map By: Sundaran Gillespie
Basemap: ESRI World Imagery

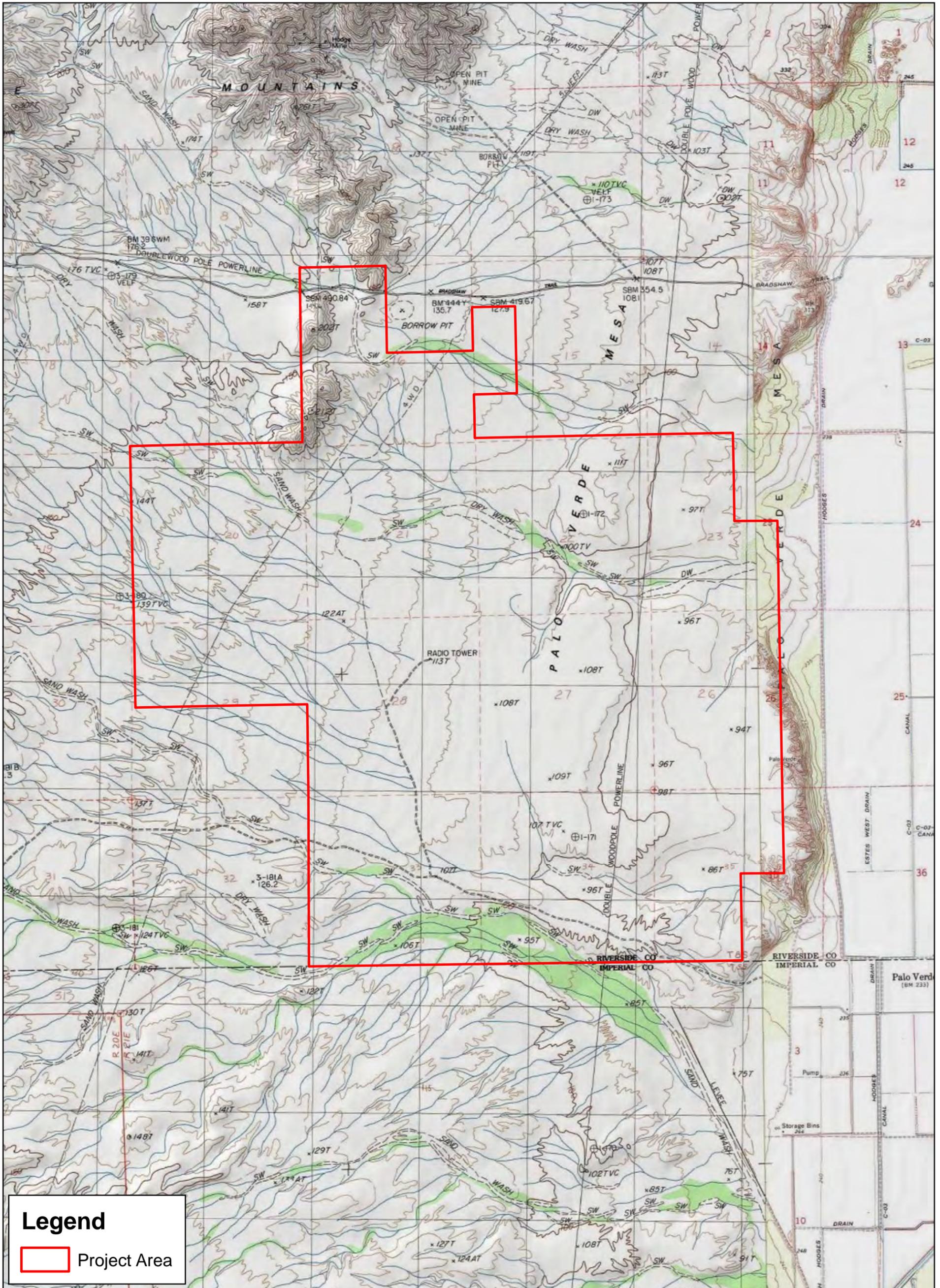


Figure 3. USGS 7.5' Topographic Quadrangle Map with Project Area

BrightSource Rio Mesa Site
Blythe, California



0 1,250 2,500 5,000
Feet

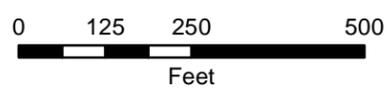


Date: October 2012
Map By: Sundaran Gillespie
Basemap: ESRI World Imagery



Figure 4. Soils in Vicinity of Mapped Wetlands

BrightSource Rio Mesa Site
Blythe, California



Date: October 2012
Map By: Sundaran Gillespie
Basemap: ESRI World Imagery

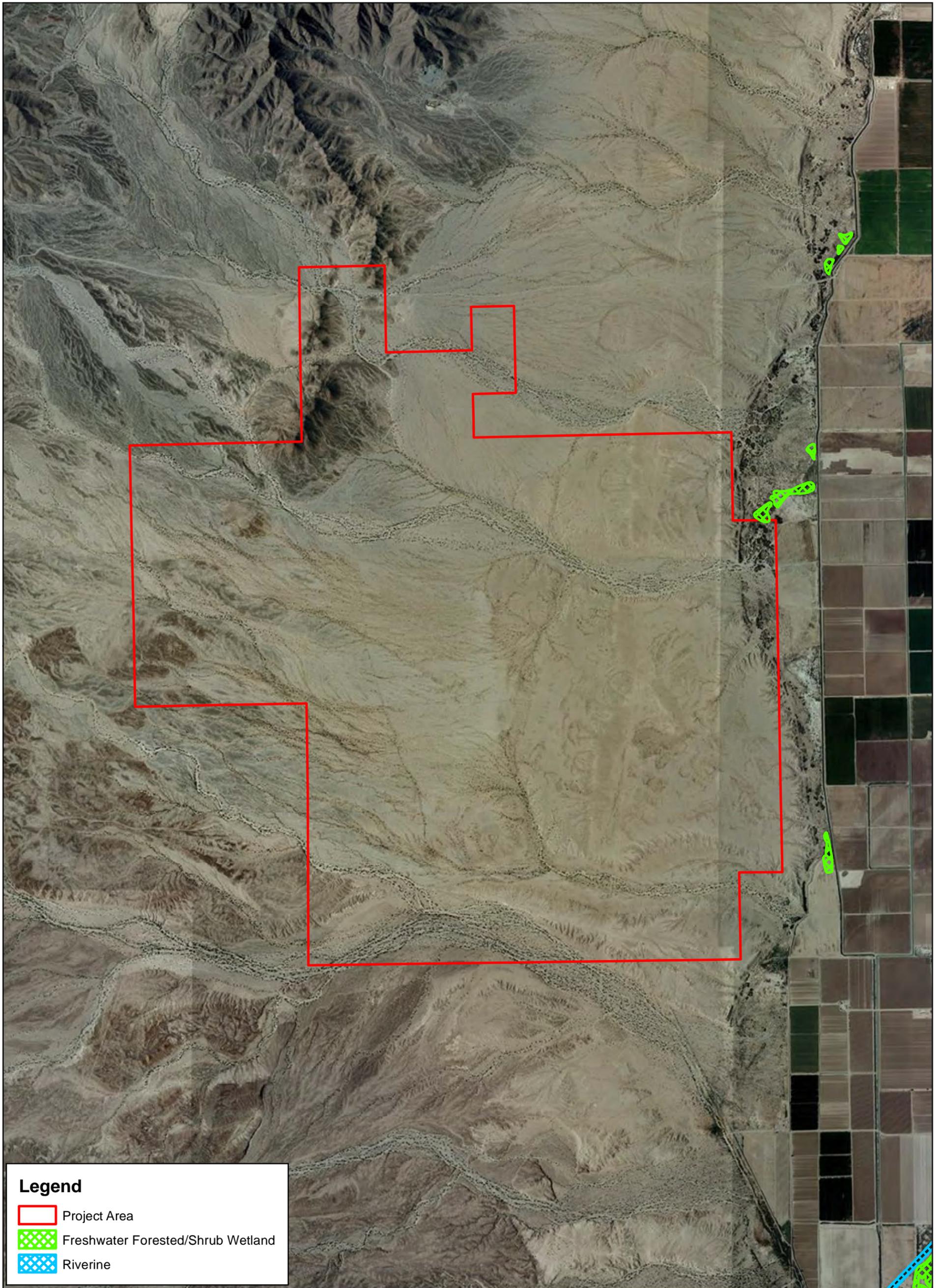
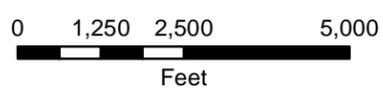


Figure 5. National Wetlands Inventory Features in the Project Area Vicinity

BrightSource Rio Mesa Site
Blythe, California



Date: October 2012
Map By: Sundaran Gillespie
Basemap: ESRI World Imagery

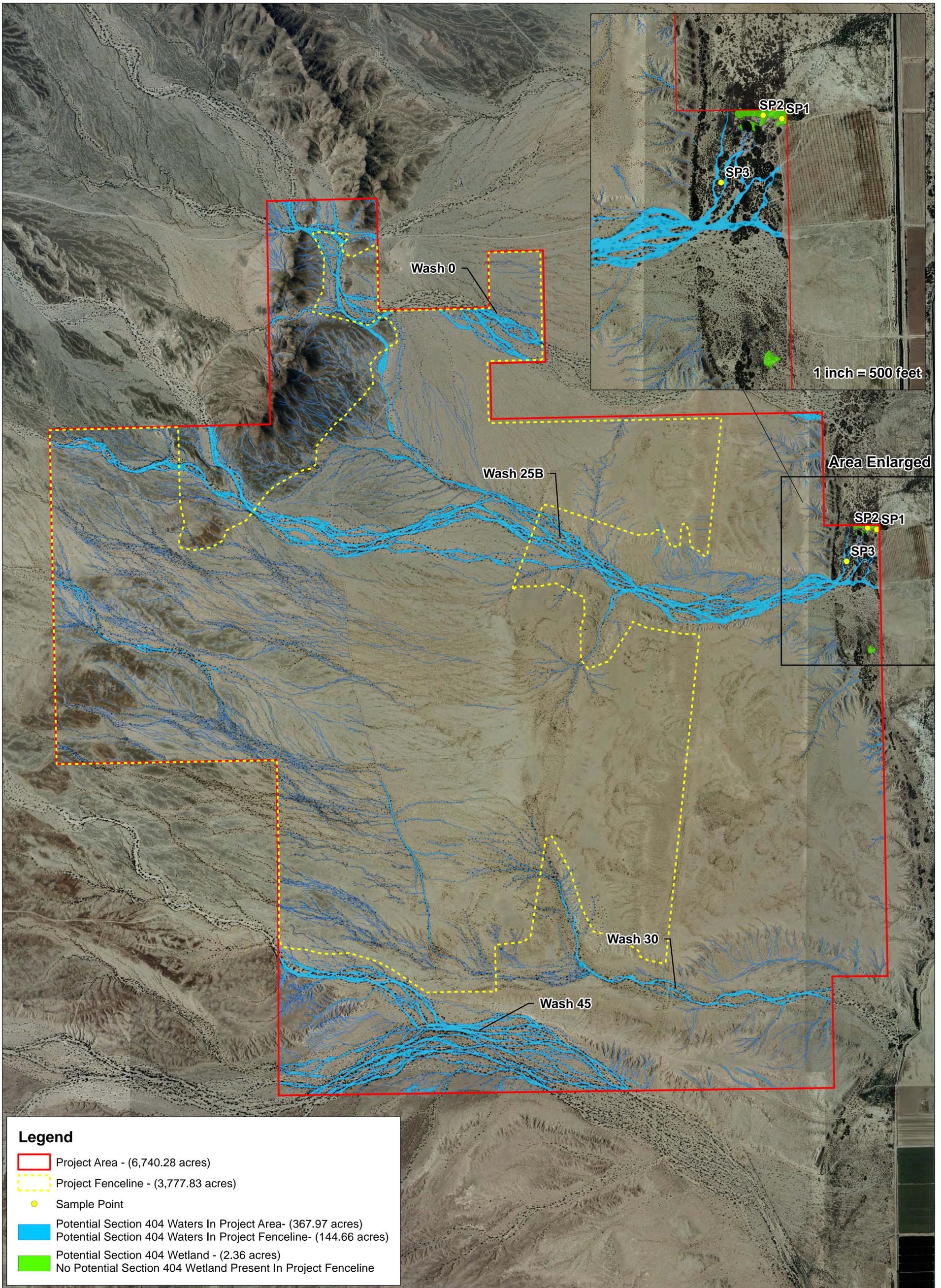
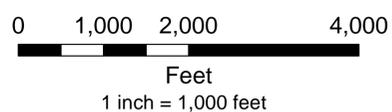
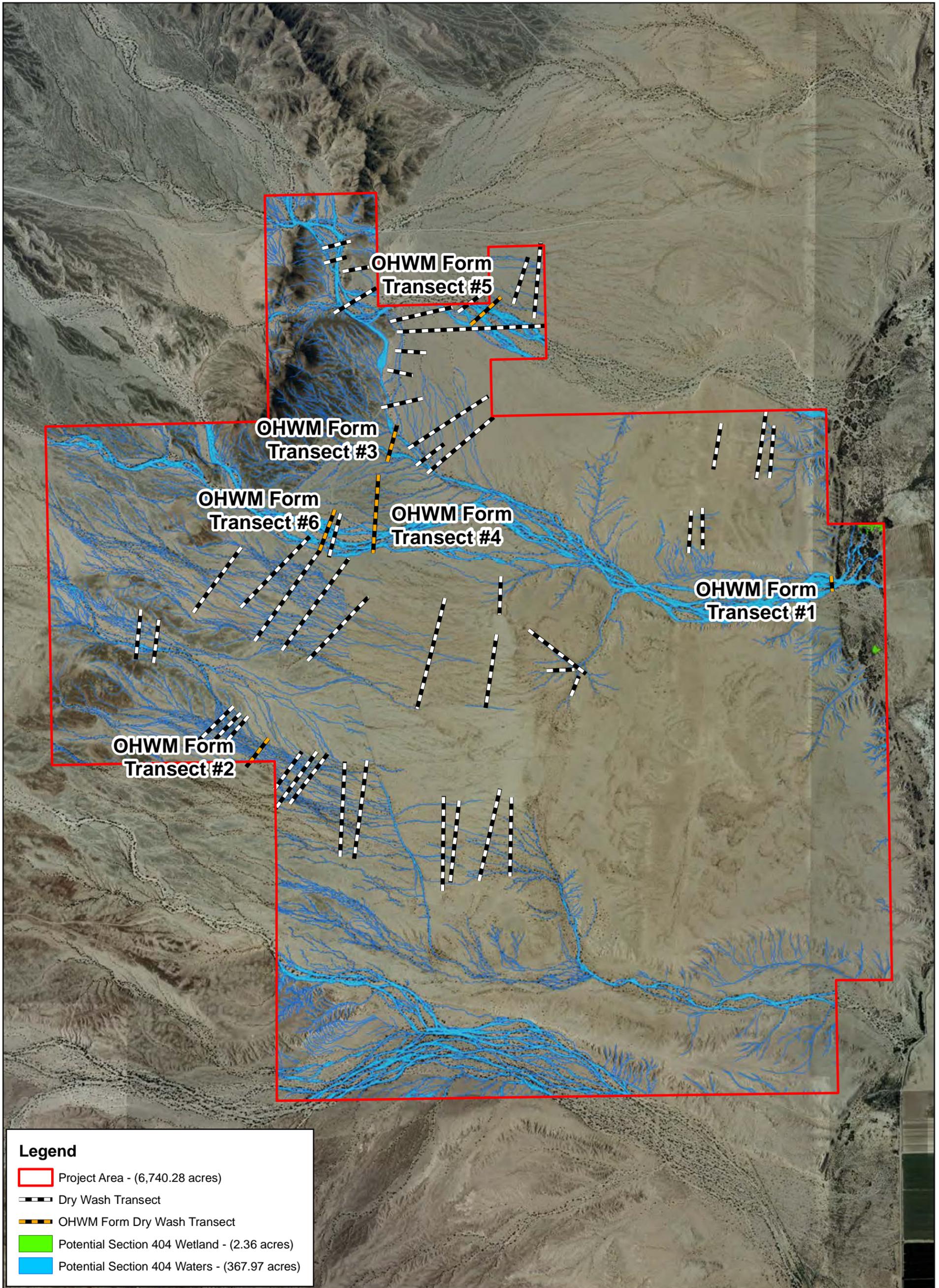


Figure 6. Potential Section 404 Waters and Wetlands of the U.S.

BrightSource Rio Mesa Site
Blythe, California



Date: October 2012
Map By: Sundaran Gillespie
Basemap: ESRI World Imagery



APPENDIX B
CORPS ARID WEST AND OHWM DATA FORMS

Wetland Determination Data Form - Arid West Region

Project/Site Rio mesa City Rio Verde County Riverside Sampling Date 9/24/12
 Applicant/Owner BSE State CA Sampling Point SP1
 Investigator(s) MT, TH, AM, RB, JK Section, Township, Range 523 T85 R21E
 Landform (hillslope, terrace, etc.) terrace Local Relief (concave, convex, none) none Slope(%) 0
 Subregion(LRR) D Lat: 33° 28' 13.72" N Long: 114° 44' 56.46" W Datum: NAD 83
 Soil Map Unit Name Gilman fine sandy loam NWI classification none

Are climatic/hydrologic conditions on-site typical for this time of year? Yes No (If no, explain in remarks)
 Are any of the following significantly disturbed? Vegetation Soil Hydrology Are "Normal Circumstances" present? Yes No
 Are any of the following naturally problematic? Vegetation Soil Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is the Sampled Area within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Hydric Soil Present? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Remarks: Wetland near project boundary at low point in terrace adjacent to Hodges drain. Water from mesa appears to collect in this area. Problematic soils present. Sample point is in a wetland.

VEGETATION (use scientific names)

STRATUM	Plot Size:	Absolute % cover	Dominant Species?	Indicator Status	Dominance Test Worksheet	
TREE STRATUM	<u>50' R</u>				Number of Dominant Species that are OBL, FACW, or FAC?	<u>1</u> (A)
1. <u>Tamarix ramosissima</u>		<u>5</u>	<u>NO</u>	<u>UPL</u>	Total number of dominant species across all strata?	<u>1</u> (B)
2. _____					% of dominant species that are OBL, FACW, or FAC?	<u>100</u> (A/B)
3. _____					Prevalence Index Worksheet	
4. _____					Total % cover of:	Multiply by:
Tree Stratum Total Cover: _____					OBL species	x1 _____
SAPLING/SHRUB STRATUM					FACW species	x2 _____
1. <u>Suaeda nigra</u>		<u>60</u>	<u>yes</u>	<u>OBL</u>	FAC species	x3 _____
2. <u>(live Suaeda = 20%)</u>					FACU species	x4 _____
3. _____					UPL species	x5 _____
4. _____					Column Totals	(A) _____ (B) _____
Sapling/Shrub Stratum Total Cover: _____					Prevalence Index = B/A = _____	
HERB STRATUM					Hydrophytic Vegetation Indicators	
1. <u>Allionia incarnata</u>		<u>10</u>	<u>NO</u>	<u>UPL</u>	<input checked="" type="checkbox"/> Dominance Test is >50%	
2. <u>Boerhavia coulteri</u>		<u>15</u>	<u>NO</u>	<u>UPL</u>	<input type="checkbox"/> Prevalence Index is <= 3.0 ¹	
3. <u>Pectis papposa</u>		<u>3</u>	<u>NO</u>	<u>UPL</u>	<input type="checkbox"/> Morphological adaptations (provide supporting data in remarks)	
4. <u>Bouteloua barbata</u>		<u>2</u>	<u>NO</u>	<u>UPL</u>	<input type="checkbox"/> Problematic hydrophytic vegetation ¹ (explain)	
5. _____					¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
6. _____					Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
7. _____						
8. _____						
Herb Stratum Total Cover: _____						
WOODY VINE STRATUM						
1. _____						
2. _____						
Woody Vines Total Cover: <u>0</u>						
% Bare ground in herb stratum _____		% cover of biotic crust _____				

Remarks: Suaeda nigra (OBL) is the only dominant vegetation

SOIL

Sampling Point

SP1

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ¹		
0-12	10YR 4/3	100	7.5Y 4/4	1	C	M	Sandy, silty loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix. ²Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Stratified Layers (A5)(LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> 1cm Muck (A9)(LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

1cm Muck (A9) (LRR C)
 2cm Muck (A10)(LRR B)
 Reduced Vertic (F18)
 Red Parent Material (TF2)
 Other (explain in remarks)

³Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks: Soils are entisols, with no apparent hydric soil indicators. Buried organic matter, layering in soil profile. Some redox concentrations in matrix. Problematic hydric soils present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	Secondary Indicators (2 or more required)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input checked="" type="checkbox"/> Water Marks (B1)(Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input checked="" type="checkbox"/> Sediment Deposits (B2)(Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Drift Deposits (B3)(Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input checked="" type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Water-Stained Leaves (B9)		

Field Observations:

Surface water present? Yes No Depth (inches): _____

Water table present? Yes No Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes No Depth (inches): _____

Wetland Hydrology Present? Yes No

Describe recorded data (stream gauge, monitoring well, aerial photos, etc.) if available.

Remarks: Multiple primary wetland hydrology indicators observed.

Wetland Determination Data Form - Arid West Region

Project/Site Rio Mesa City Palo Verde County Riverside Sampling Date 9/24/12
 Applicant/Owner BSE State CA Sampling Point SP2
 Investigator(s) MT, JK, TH, AM, RB Section, Township, Range S23 T8S R21E
 Landform (hillslope, terrace, etc.) terrace Local Relief (concave, convex, none) None Slope(%) <1
 Subregion(LRR) D Lat: 33° 28' 14.13" N Long: 114° 44' 58.04" W Datum: NAD 83
 Soil Map Unit Name Carrizo gravelly sand NWI classification None

Are climatic/hydrologic conditions on-site typical for this time of year? Yes No (If no, explain in remarks)
 Are any of the following significantly disturbed? Vegetation Soil Hydrology Are "Normal Circumstances" present? Yes No
 Are any of the following naturally problematic? Vegetation Soil Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is the Sampled Area within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
---	---

Remarks: Wetland is in lowest portion of terrace adjacent to Hodges Drain. Area appears to receive flow from mesa to west, and flows appear to collect in this area. Problematic hydric soils present. Sample point is in a wetland.

VEGETATION (use scientific names)

TREE STRATUM	Plot Size:	Absolute % cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	_____	Dominance Test Worksheet Number of Dominant Species that are OBL, FACW, or FAC? <u>1</u> (A) Total number of dominant species across all strata? <u>0</u> (B) % of dominant species that are OBL, FACW, or FAC? <u>100</u> (A/B)
2. _____	_____	_____	_____	_____	
3. _____	_____	_____	_____	_____	
4. _____	_____	_____	_____	_____	
Tree Stratum Total Cover:		<u>0</u>			Prevalence Index Worksheet Total % cover of: _____ Multiply by: _____ OBL species <u>80</u> x1 <u>80</u> FACW species _____ x2 _____ FAC species _____ x3 _____ FACU species _____ x4 _____ UPL species _____ x5 _____ Column Totals <u>80</u> (A) <u>80</u> (B) Prevalence Index = B/A = <u>1</u>
SAPLING/SHRUB STRATUM	Plot Size:	Absolute % cover	Dominant Species?	Indicator Status	
1. <u>Suaeda nigra</u>	_____	<u>80</u>	<u>Yes</u>	<u>OBL</u>	
2. <u>(live Suaeda = 30%)</u>	_____	_____	_____	_____	
3. _____	_____	_____	_____	_____	
4. _____	_____	_____	_____	_____	
Sapling/Shrub Stratum Total Cover:		<u>80</u>			
HERB STRATUM	Plot Size:	Absolute % cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	_____	Hydrophytic Vegetation Indicators <input checked="" type="checkbox"/> Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is <= 3.0 ¹ <input type="checkbox"/> Morphological adaptations (provide supporting data in remarks) <input type="checkbox"/> Problematic hydrophytic vegetation ¹ (explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	_____	_____	_____	_____	
3. _____	_____	_____	_____	_____	
4. _____	_____	_____	_____	_____	
5. _____	_____	_____	_____	_____	
6. _____	_____	_____	_____	_____	
7. _____	_____	_____	_____	_____	
8. _____	_____	_____	_____	_____	
Herb Stratum Total Cover:		<u>0</u>			
WOODY VINE STRATUM	Plot Size:	Absolute % cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	_____	Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2. _____	_____	_____	_____	_____	
Woody Vines Total Cover:		<u>0</u>			
% Bare ground in herb stratum <u>100%</u>		% cover of biotic crust _____			

Remarks: Approx -50% of S. nigra is dead.

SOIL

Sampling Point SP 2

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features		Type ¹	Loc ¹	Texture	Remarks
	Color (moist)	%	Color (moist)	%				
0-12	10YR 4/3	100	N/A				Sandy silty loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix. ²Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- | | |
|--|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> Stratified Layers (A5)(LRR C) | <input type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> 1cm Muck (A9)(LRR D) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Vernal Pools (F9) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | |

Indicators for Problematic Hydric Soils³:

- 1cm Muck (A9) (LRR C)
- 2cm Muck (A10)(LRR B)
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Other (explain in remarks)

³Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____
Depth (inches): _____

Hydric Soil Present ? Yes No

Remarks: Soils are *entisols*, with no apparent hydric soil indicators. Dominant hydrophytic vegetation and wetland hydrology present. Problematic hydric soils present. Layering of sediment present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

Secondary Indicators (2 or more required)

- | | |
|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Biotic Crust (B12) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Water Marks (B1)(Nonriverine) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input checked="" type="checkbox"/> Sediment Deposits (B2)(Nonriverine) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)(Nonriverine) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input checked="" type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Recent Iron Reduction in PLOWed Soils (C6) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |

- Water Marks (B1)(Riverine)
- Sediment Deposits (B2)(Riverine)
- Drift Deposits (B3)(Riverine)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Thin Muck Surface (C7)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)

Field Observations:

Surface water present? Yes No Depth (inches): _____
 Water table present? Yes No Depth (inches): _____
 Saturation Present? Yes No Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present ? Yes No

Describe recorded data (stream gauge, monitoring well, aerial photos, etc.) if available.

Remarks: Multiple primary wetland hydrology indicators observed.

Wetland Determination Data Form - Arid West Region

9/24/12
Upland w/ W2

Project/Site Rio Mesa City Del Verde County Riverside Sampling Date 9/24/12
 Applicant/Owner BSE State CA Sampling Point SP 3
 Investigator(s) MT, TH, AM, RB, JK Section, Township, Range 523 T8S R21E
 Landform (hillslope, terrace, etc.) Terrace Local Relief (concave, convex, none) none Slope(%) 0
 Subregion(LRR) D Lat: 38° 28' 6.244N Long: 114° 45' 4.079W Datum: NAD 83
 Soil Map Unit Name Rositas Fine Sand + Dune Sand NWI classification _____

Are climatic/hydrologic conditions on-site typical for this time of year? Yes No (If no, explain in remarks)
 Are any of the following significantly disturbed? Vegetation Soil Hydrology Are "Normal Circumstances" present? Yes No
 Are any of the following naturally problematic? Vegetation Soil Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Hydric Soil Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is the Sampled Area within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Remarks: <u>Upland terrace within mesquite bosque near active channels</u>	

VEGETATION (use scientific names)

TREE STRATUM	Plot Size:	Absolute % cover	Dominant Species?	Indicator Status	Dominance Test Worksheet
1.					Number of Dominant Species that are OBL, FACW, or FAC? <u>0</u> (A)
2.					Total number of dominant species across all strata? <u>4</u> (B)
3.					% of dominant species that are OBL, FACW, or FAC? <u>0%</u> (A/B)
4.					
Tree Stratum Total Cover: _____					
SAPLING/SHRUB STRATUM	Plot Size:	Absolute % cover	Dominant Species?	Indicator Status	Prevalence Index Worksheet
1.	<u>5x5</u>				Total % cover of: _____ Multiply by: _____
2.		<u>10</u>	<u>yes</u>	<u>upl</u>	OBL species _____ x1 _____
3.		<u>30</u>	<u>yes</u>	<u>upl</u>	FACW species _____ x2 _____
4.					FAC species _____ x3 _____
Sapling/Shrub Stratum Total Cover: <u>40</u>					FACU species _____ x4 _____
					UPL species _____ x5 _____
					Column Totals _____ (A) _____ (B)
					Prevalence Index = B/A = _____
HERB STRATUM	Plot Size:	Absolute % cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators
1.					<input type="checkbox"/> Dominance Test is >50%
2.		<u>2</u>	<u>yes</u>	<u>upl</u>	<input type="checkbox"/> Prevalence Index is <= 3.0 ¹
3.		<u><1</u>	<u>no</u>	<u>upl</u>	<input type="checkbox"/> Morphological adaptations (provide supporting data in remarks)
4.		<u>1</u>	<u>yes</u>	<u>upl</u>	<input type="checkbox"/> Problematic hydrophytic vegetation ¹ (explain)
5.					
6.					
7.					
8.					
Herb Stratum Total Cover: <u>3</u>					
WOODY VINE STRATUM	Plot Size:	Absolute % cover	Dominant Species?	Indicator Status	Footnote
1.					¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2.					
Woody Vines Total Cover: _____					
% Bare ground in herb stratum <u>100%</u> % cover of biotic crust <u>0%</u>					Hydrophytic Vegetation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Remarks: Upland vegetatn within floodplain adjacent to historic Colorado River floodplain bluff.

SOIL

Sampling Point **SP3**

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ¹		
0-12	7.5 YR 5/6	100	NA	NA	NA	NA	Sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix. ²Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Stratified Layers (A5)(LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> 1cm Muck (A9)(LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

³Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? Yes No

Remarks: Soils entisols within active floodplain, NRCS has soils listed as DuneLand (DvD). This appears inaccurate as soils more closely resemble nearby Rositas fine sand (LoA)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1)(Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2)(Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3)(Riverine)
<input type="checkbox"/> Water Marks (B1)(Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2)(Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)(Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in PLOWed Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Shallow Aquitard (D3)
		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

Surface water present? Yes No Depth (inches): _____

Water table present? Yes No Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes No Depth (inches): _____

Wetland Hydrology Present ? Yes No

Describe recorded data (stream gauge, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of wetland hydrology present

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Rio Mesa Solar Generating Facility	Date: 9/24/2012	Time: 11:00 AM
Project Number: 22208	Town: Palo Verde	State: CA
Stream: Blue/G Wash	Photo begin file#:	Photo end file#:
Investigator(s): AM, MT, JH, RB, JK	RB camera	

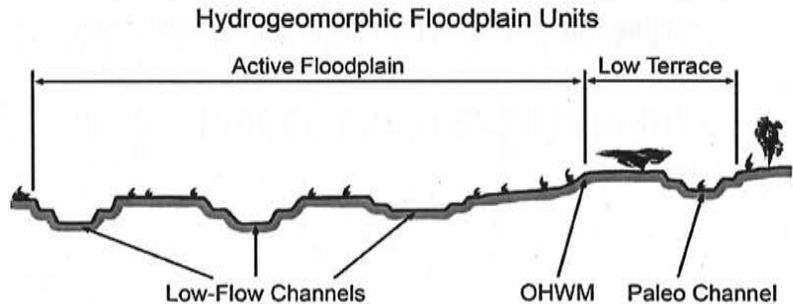
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?	Location Details: large wash, NE of Project Area near mapped Suaeda nigra wetland
Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?	Projection: Datum:
	Coordinates: 33.466° N 114.752° W WGS 1984

Potential anthropogenic influences on the channel system:
 Vehicles, oaks, hunting, historic debris within channel

Brief site description: large dry wash w/ many late successional vegetated islands

Checklist of resources (if available):

<input checked="" type="checkbox"/> Aerial photography	<input type="checkbox"/> Stream gage data
Dates:	Gage number:
<input type="checkbox"/> Topographic maps	Period of record:
<input type="checkbox"/> Geologic maps	<input type="checkbox"/> History of recent effective discharges
<input type="checkbox"/> Vegetation maps	<input type="checkbox"/> Results of flood frequency analysis
<input checked="" type="checkbox"/> Soils maps	<input type="checkbox"/> Most recent shift-adjusted rating
<input type="checkbox"/> Rainfall/precipitation maps	<input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event
<input checked="" type="checkbox"/> Existing delineation(s) for site	
<input checked="" type="checkbox"/> Global positioning system (GPS)	
<input type="checkbox"/> Other studies	



Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

- Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
- Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
- Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - Record the floodplain unit and GPS position.
 - Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - Identify any indicators present at the location.
- Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
- Identify the OHWM and record the indicators. Record the OHWM position via:

<input type="checkbox"/> Mapping on aerial photograph	<input checked="" type="checkbox"/> GPS
<input checked="" type="checkbox"/> Digitized on computer	<input type="checkbox"/> Other:

Wentworth Size Classes

Millimeters (mm)	Inches (in)	Wentworth size class
10.08	256	Boulder
2.56	64	Cobble
0.157	4	Pebble
0.079	2.00	Granule
0.039	1.00	Very coarse sand
0.020	0.50	Coarse sand
1/2 0.0098	0.25	Medium sand
1/4 0.005	0.125	Fine sand
1/8 0.0025	0.0625	Very fine sand
1/16 0.0012	0.031	Coarse silt
1/32 0.00061	0.0156	Medium silt
1/64 0.00031	0.0078	Fine silt
1/128 0.00015	0.0039	Very fine silt
		Clay



photos

OHW #1

-JK6866-JK Wash 1 - overview from terrace

Photo - JK 6862 - JK Wash 1 - Facing S

- JK 6863 - JK Wash 1 - facing N

- JK 6864 - 6865 - JK Wash 1 - braided channels

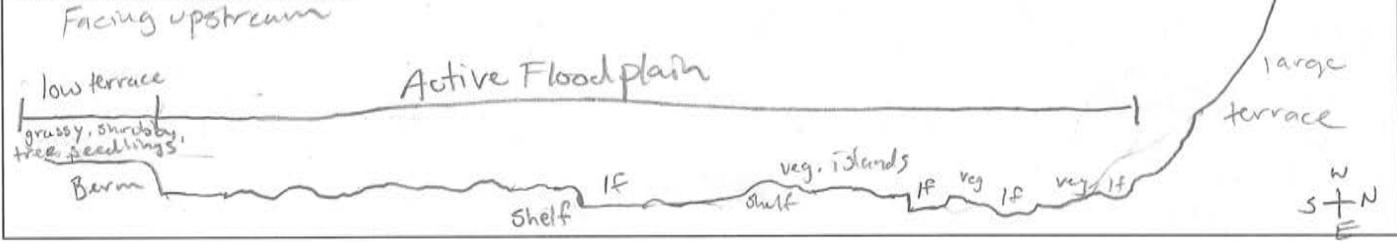
Project ID: 22208

Cross section ID: OHWM 1

Date: 9/24/12

Time: 11:00 AM

Cross section drawing:



OHW

GPS point: OHW transect 1

Indicators:

- Change in average sediment texture
- Change in vegetation species
- Change in vegetation cover
- Break in bank slope
- Other: See comments
- Other: _____

Comments:

Shelving; wrack around *Larrea tridentata*, *Prosopis glandulosa*, sediment sorting

Floodplain unit:

- Low-Flow Channel
- Active Floodplain
- Low Terrace

GPS point: OHW transect 1

Characteristics of the floodplain unit:

Average sediment texture: loamy sand
 Total veg cover: 5 % Tree: 0 % Shrub: 4 % Herb: 1 %

Community successional stage:

- NA
- Early (herbaceous & seedlings)
- Mid (herbaceous, shrubs, saplings)
- Late (herbaceous, shrubs, mature trees)

Indicators:

- Mudcracks
- Ripples
- Drift and/or debris
- Presence of bed and bank
- Benches
- Soil development
- Surface relief
- Other: sediment sorting
- Other: _____
- Other: _____

Comments:

Mudcracks, Drift and debris present, and sediment sorting observed. Benches + bed and bank present.

Project ID: 22208 Cross section ID: OHWM #1 Date: 9/24/12 Time: 11:00 AM

Floodplain unit: Low-Flow Channel Active Floodplain Low Terrace

GPS point: OHWM transect 1

Characteristics of the floodplain unit:

Average sediment texture: loamy sand

Total veg cover: 25 % Tree: 15 % Shrub: 8 % Herb: 2 %

Community successional stage:

- | | |
|---|---|
| <input type="checkbox"/> NA | <input type="checkbox"/> Mid (herbaceous, shrubs, saplings) |
| <input type="checkbox"/> Early (herbaceous & seedlings) | <input checked="" type="checkbox"/> Late (herbaceous, shrubs, mature trees) |

Indicators:

- | | |
|--|---|
| <input checked="" type="checkbox"/> Mudcracks | <input type="checkbox"/> Soil development |
| <input type="checkbox"/> Ripples | <input type="checkbox"/> Surface relief |
| <input checked="" type="checkbox"/> Drift and/or debris | <input checked="" type="checkbox"/> Other: <u>Sediment sorting on islands</u> |
| <input checked="" type="checkbox"/> Presence of bed and bank | <input type="checkbox"/> Other: _____ |
| <input checked="" type="checkbox"/> Benches | <input type="checkbox"/> Other: _____ |

Comments:

old, large Paloverde / ironwood woodland

Floodplain unit: Low-Flow Channel Active Floodplain Low Terrace

GPS point: OHWM transect 1

Characteristics of the floodplain unit:

Average sediment texture: Sandy loam w/ gravel

Total veg cover: 30 % Tree: 5 % Shrub: 13 % Herb: 12 %

Community successional stage:

- | | |
|---|---|
| <input type="checkbox"/> NA | <input type="checkbox"/> Mid (herbaceous, shrubs, saplings) |
| <input type="checkbox"/> Early (herbaceous & seedlings) | <input checked="" type="checkbox"/> Late (herbaceous, shrubs, mature trees) |

Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Mudcracks | <input type="checkbox"/> Soil development |
| <input type="checkbox"/> Ripples | <input type="checkbox"/> Surface relief |
| <input type="checkbox"/> Drift and/or debris | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Presence of bed and bank | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Benches | <input type="checkbox"/> Other: _____ |

Comments:

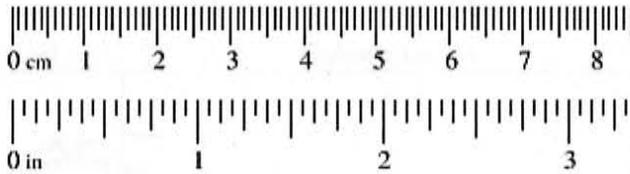
grassy low terrace, old creosote and microphyll woodland
no indicators observed

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Rio Mesa Solar EGF		Date: 9/26	Time: 9:00 AM				
Project Number: 22208		Town: W. of Palo Verde	State: CA				
Stream: H2 Wash		Photo begin file#: 1715	Photo end file#: 1719 (RB camera)				
Investigator(s): AM, JK, MT, TH, RB							
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?		Location Details: H2 Wash, south of North Tower site					
Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?		Projection: Datum: WGS 1984					
Potential anthropogenic influences on the channel system: Vehicles, OHVS, Hunting, Garbage Dumping		Coordinates: 33° 27' 25.780" N, 114° 47' 48.485" W					
Brief site description: Broad floodplain wash w/ many low flow channels and higher elevation vegetated islands. Some overflow channels + historic/relict features, lots of overflow in select areas. Microphyll woodland across area.							
Checklist of resources (if available):							
<input checked="" type="checkbox"/> Aerial photography		<input type="checkbox"/> Stream gage data					
Dates:		Gage number:					
<input type="checkbox"/> Topographic maps		Period of record:					
<input type="checkbox"/> Geologic maps		<input type="checkbox"/> History of recent effective discharges					
<input checked="" type="checkbox"/> Vegetation maps		<input type="checkbox"/> Results of flood frequency analysis					
<input checked="" type="checkbox"/> Soils maps		<input type="checkbox"/> Most recent shift-adjusted rating					
<input type="checkbox"/> Rainfall/precipitation maps		<input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event					
<input checked="" type="checkbox"/> Existing delineation(s) for site							
<input checked="" type="checkbox"/> Global positioning system (GPS)							
<input type="checkbox"/> Other studies							
<p style="text-align: center;">Hydrogeomorphic Floodplain Units</p>							
<p>Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:</p> <ol style="list-style-type: none"> Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site. Select a representative cross section across the channel. Draw the cross section and label the floodplain units. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units. <ol style="list-style-type: none"> Record the floodplain unit and GPS position. Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit. Identify any indicators present at the location. Repeat for other points in different hydrogeomorphic floodplain units across the cross section. Identify the OHWM and record the indicators. Record the OHWM position via: <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Mapping on aerial photograph</td> <td><input checked="" type="checkbox"/> GPS</td> </tr> <tr> <td><input checked="" type="checkbox"/> Digitized on computer</td> <td><input type="checkbox"/> Other:</td> </tr> </table> 				<input type="checkbox"/> Mapping on aerial photograph	<input checked="" type="checkbox"/> GPS	<input checked="" type="checkbox"/> Digitized on computer	<input type="checkbox"/> Other:
<input type="checkbox"/> Mapping on aerial photograph	<input checked="" type="checkbox"/> GPS						
<input checked="" type="checkbox"/> Digitized on computer	<input type="checkbox"/> Other:						

Wentworth Size Classes

Millimeters (mm)	Inches (in)	Wentworth size class
10.08	256	Boulder
2.56	64	Cobble
0.157	4	Pebble
0.079	2.00	Granule
0.039	1.00	Very coarse sand
0.020	0.50	Coarse sand
1/2 0.0098	0.25	Medium sand
1/4 0.005	0.125	Fine sand
1/8 0.0025	0.0625	Very fine sand
1/16 0.0012	0.031	Coarse silt
1/32 0.00061	0.0156	Medium silt
1/64 0.00031	0.0078	Fine silt
1/128 0.00015	0.0039	Very fine silt
		Clay



Project ID: 22208 Cross section ID: OHWM 2 Date: 9/26/12 Time: 9:00 AM

Floodplain unit: Low-Flow Channel Active Floodplain Low TerraceGPS point: OHWM transect 2**Characteristics of the floodplain unit:**Average sediment texture: Sandy w/ low amount gravelTotal veg cover: ~1 % Tree: % Shrub: % Herb: ~1 %

Community successional stage:

- | | |
|--|--|
| <input type="checkbox"/> NA | <input type="checkbox"/> Mid (herbaceous, shrubs, saplings) |
| <input checked="" type="checkbox"/> Early (herbaceous & seedlings) | <input type="checkbox"/> Late (herbaceous, shrubs, mature trees) |

Indicators:

- | | |
|---|--|
| <input type="checkbox"/> Mudcracks | <input type="checkbox"/> Soil development |
| <input checked="" type="checkbox"/> Ripples | <input type="checkbox"/> Surface relief |
| <input checked="" type="checkbox"/> Drift and/or debris | <input checked="" type="checkbox"/> Other: <u>sediment sorting</u> |
| <input type="checkbox"/> Presence of bed and bank | <input type="checkbox"/> Other: _____ |
| <input checked="" type="checkbox"/> Benches | <input type="checkbox"/> Other: _____ |

Comments:

Mostly unvegetated from recent flow disturbance, very sandy soils, defined shelving

Floodplain unit: Low-Flow Channel Active Floodplain Low TerraceGPS point: OHWM transect 2**Characteristics of the floodplain unit:**Average sediment texture: Sandy w/ lots of gravel + cobbleTotal veg cover: 35 % Tree: ~1 % Shrub: 70 % Herb: 30 %

Community successional stage:

- | | |
|---|--|
| <input type="checkbox"/> NA | <input type="checkbox"/> Mid (herbaceous, shrubs, saplings) |
| <input type="checkbox"/> Early (herbaceous & seedlings) | <input type="checkbox"/> Late (herbaceous, shrubs, mature trees) |

Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Mudcracks | <input type="checkbox"/> Soil development |
| <input type="checkbox"/> Ripples | <input type="checkbox"/> Surface relief |
| <input type="checkbox"/> Drift and/or debris | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Presence of bed and bank | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Benches | <input type="checkbox"/> Other: _____ |

Comments:

Creosote bush scrub-dominated, microphyll woodland drops out, No indicators observed

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Rio Mesa Brightsource delin.	Date: 9/28/12	Time: 0720
Project Number: 22208	Town: Palo Verde	State: CA
Stream: G/Blue Wash	Photo begin file#:	Photo end file#:
Investigator(s): MT/TH	TH 2095 (North end)	TH 2101 (South end)

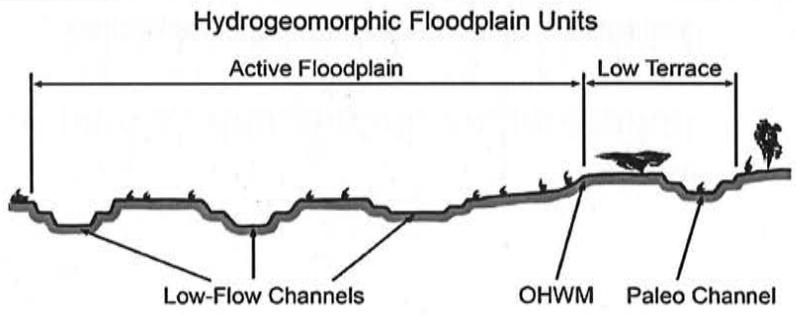
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?	Location Details: North arm of 'ble wash' near western portion of heliostat array
Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?	Projection: (N. end) 33.47721206 N Datum: 83.47543040 N (S end) Coordinates: 114.78620847 W / 114.7862994 W

Potential anthropogenic influences on the channel system:
 Limited road crossing grading upstream of transect, historic debris within wash.

Brief site description:
 Braided, ephemeral wash system is tributary to one of the major drainage systems in the project area. Dense Mesophyll woodland within active floodplain.

Checklist of resources (if available):

<input checked="" type="checkbox"/> Aerial photography Dates:	<input type="checkbox"/> Stream gage data Gage number:
<input type="checkbox"/> Topographic maps	Period of record:
<input type="checkbox"/> Geologic maps	<input type="checkbox"/> History of recent effective discharges
<input type="checkbox"/> Vegetation maps	<input type="checkbox"/> Results of flood frequency analysis
<input type="checkbox"/> Soils maps	<input type="checkbox"/> Most recent shift-adjusted rating
<input type="checkbox"/> Rainfall/precipitation maps	<input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event
<input checked="" type="checkbox"/> Existing delineation(s) for site	
<input checked="" type="checkbox"/> Global positioning system (GPS)	
<input type="checkbox"/> Other studies	



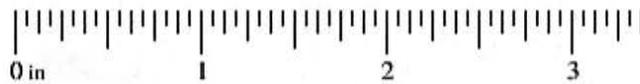
Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

- Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
- Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
- Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - Record the floodplain unit and GPS position.
 - Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - Identify any indicators present at the location.
- Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
- Identify the OHWM and record the indicators. Record the OHWM position via:

<input type="checkbox"/> Mapping on aerial photograph	<input checked="" type="checkbox"/> GPS
<input type="checkbox"/> Digitized on computer	<input type="checkbox"/> Other:

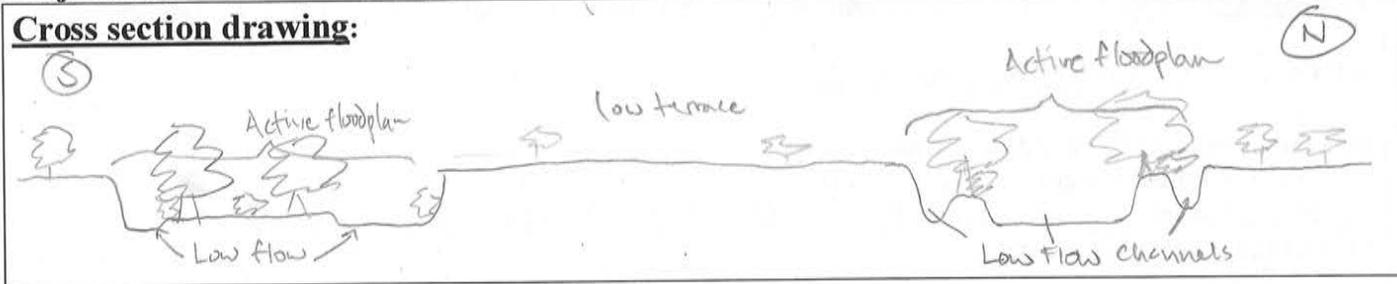
Wentworth Size Classes

Millimeters (mm)		Inches (in)		Wentworth size class		
	10.08	— — —	256	— — —	Boulder	Gravel
	2.56	— — —	64	— — —	Cobble	
	0.157	— — —	4	— — —	Pebble	
	0.079	— — —	2.00	— — —	Granule	
	0.039	— — —	1.00	— — —	Very coarse sand	Sand
	0.020	— — —	0.50	— — —	Coarse sand	
1/2	0.0098	— — —	0.25	— — —	Medium sand	
1/4	0.005	— — —	0.125	— — —	Fine sand	
1/8	0.0025	— — —	0.0625	— — —	Very fine sand	
1/16	0.0012	— — —	0.031	— — —	Coarse silt	Silt
1/32	0.00061	— — —	0.0156	— — —	Medium silt	
1/64	0.00031	— — —	0.0078	— — —	Fine silt	
1/128	0.00015	— — —	0.0039	— — —	Very fine silt	
					Clay	Mud



Project ID: 22208 Cross section ID: OHWM #3 Date: 9/28/12 Time: 0720

Cross section drawing:



OHWM

GPS point: OHWM transect 3

Indicators:

- Change in average sediment texture
- Change in vegetation species
- Change in vegetation cover
- Break in bank slope
- Other: _____
- Other: _____

Comments: Two moderate-sized washes with plain of desert asphalt in between. Microphyll woodland present in washes with distinct break to creosote shrub at low terrace.

Floodplain unit: Low-Flow Channel Active Floodplain Low Terrace

GPS point: OHWM transect 3

Characteristics of the floodplain unit:

Average sediment texture: Sand - with granule to pebble size gravel
 Total veg cover: <1 % Tree: 0 % Shrub: 0 % Herb: <1 %

Community successional stage:

- NA
- Early (herbaceous & seedlings)
- Mid (herbaceous, shrubs, saplings)
- Late (herbaceous, shrubs, mature trees)

Indicators:

- Mudcracks
- Ripples
- Drift and/or debris
- Presence of bed and bank
- Benches
- Soil development
- Surface relief
- Other: Sediment deposition
- Other: _____
- Other: _____

Comments:

Project ID: 22208 Cross section ID: OHWM #3 Date: 9/28/12 Time: 0720

Floodplain unit: Low-Flow Channel Active Floodplain Low Terrace

GPS point: OHWM transect 3

Characteristics of the floodplain unit:

Average sediment texture: Gravelly sand

Total veg cover: 60 % Tree: 30 % Shrub: 15 % Herb: 15 %

Community successional stage:

- NA Mid (herbaceous, shrubs, saplings)
 Early (herbaceous & seedlings) Late (herbaceous, shrubs, mature trees)

Indicators:

- Mudcracks Soil development
 Ripples Surface relief
 Drift and/or debris Other: _____
 Presence of bed and bank Other: _____
 Benches Other: _____

Comments:

Mature, dense microphyll woodland located within active floodplain, rooted above low-flow channels.

Floodplain unit: Low-Flow Channel Active Floodplain Low Terrace

GPS point: OHWM transect 3

Characteristics of the floodplain unit:

Average sediment texture: Gravel, sandy gravel

Total veg cover: 50 % Tree: <1 % Shrub: 25 % Herb: 25 %

Community successional stage:

- NA Mid (herbaceous, shrubs, saplings)
 Early (herbaceous & seedlings) Late (herbaceous, shrubs, mature trees)

Indicators: None

- Mudcracks Soil development
 Ripples Surface relief
 Drift and/or debris Other: _____
 Presence of bed and bank Other: _____
 Benches Other: _____

Comments: No indicators observed

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Rio Mesa Solar EGF	Date: 9/28/12	Time: 0720
Project Number: 22208	Town: SW of Blythe	State: CA
Stream: Blue Wash (G Wash)	Photo begin file#:	Photo end file#:
Investigator(s): JK, RB	RB - Camera 1911	1917

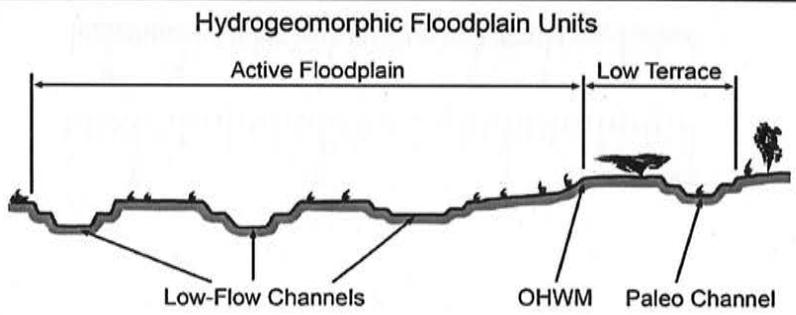
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?	Location Details: Blue wash, Middle of Project site E. of AM's first blue wash form from 9/25/12
Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?	Projection: Datum: WGS 1984
Coordinates: 33°28'10.471"N 114°47'17.273"W	

Potential anthropogenic influences on the channel system:
Roads, OHVs, Trashy, Hunting

Brief site description: Large dry wash system with wide washes (ca. 5-80ft. in width), large vegetated islands also present, microphyll woodland present across site; creosote bush scrub also present, low herb cover

Checklist of resources (if available):

<input checked="" type="checkbox"/> Aerial photography	<input type="checkbox"/> Stream gage data
Dates:	Gage number:
<input type="checkbox"/> Topographic maps	Period of record:
<input type="checkbox"/> Geologic maps	<input type="checkbox"/> History of recent effective discharges
<input type="checkbox"/> Vegetation maps	<input type="checkbox"/> Results of flood frequency analysis
<input type="checkbox"/> Soils maps	<input type="checkbox"/> Most recent shift-adjusted rating
<input type="checkbox"/> Rainfall/precipitation maps	<input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event
<input type="checkbox"/> Existing delineation(s) for site	
<input checked="" type="checkbox"/> Global positioning system (GPS)	
<input type="checkbox"/> Other studies	



- Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**
1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
 2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
 3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - a) Record the floodplain unit and GPS position.
 - b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - c) Identify any indicators present at the location.
 4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
 5. Identify the OHWM and record the indicators. Record the OHWM position via:

<input type="checkbox"/> Mapping on aerial photograph	<input checked="" type="checkbox"/> GPS
<input checked="" type="checkbox"/> Digitized on computer	<input type="checkbox"/> Other:

Wentworth Size Classes

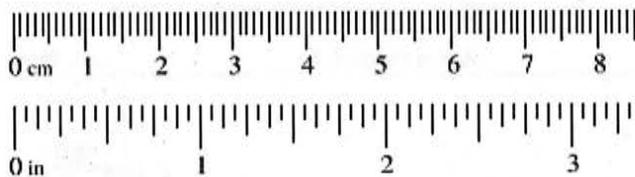
Millimeters (mm)	Inches (in)	Wentworth size class
10.08	256	Boulder
2.56	64	Cobble
0.157	4	Pebble
0.079	2.00	Granule
0.039	1.00	Very coarse sand
0.020	0.50	Coarse sand
1/2 0.0098	0.25	Medium sand
1/4 0.005	0.125	Fine sand
1/8 0.0025	0.0625	Very fine sand
1/16 0.0012	0.031	Coarse silt
1/32 0.00061	0.0156	Medium silt
1/64 0.00031	0.0078	Fine silt
1/128 0.00015	0.0039	Very fine silt
		Clay

Gravel

Sand

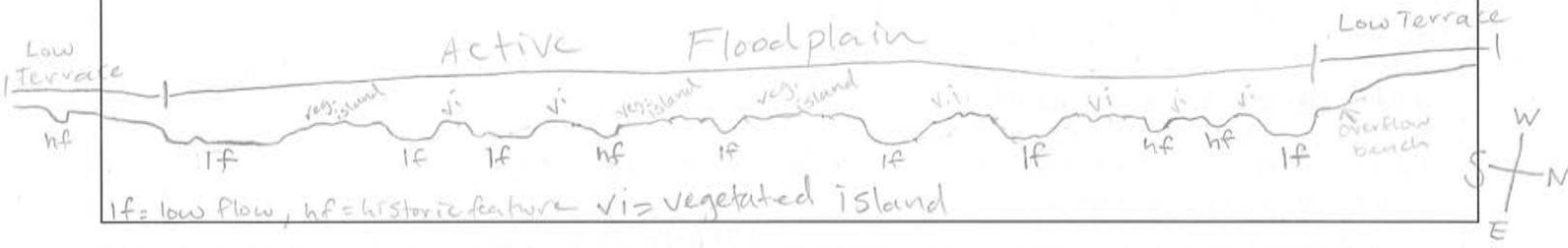
Silt

Mud



Project ID: 22208 Cross section ID: OHWM 4 Wash Date: 9/28/2012 Time: 0720

Cross section drawing: Looking West/N.West upstream



OHW

GPS point: OHWM transect 4

Indicators:

- Change in average sediment texture
- Change in vegetation species
- Change in vegetation cover
- Break in bank slope
- Other: _____
- Other: _____

Comments: large active floodplain and well defined shelf, microfill woodland present.

Floodplain unit: Low-Flow Channel Active Floodplain Low Terrace

GPS point: OHWM transect 4

Characteristics of the floodplain unit:

Average sediment texture: sand w/gravel, large cobble
 Total veg cover: 5 % Tree: 4 % Shrub: % Herb: <1 %
 Community successional stage:

- NA
- Early (herbaceous & seedlings)
- Mid (herbaceous, shrubs, saplings) to late, some large trees
- Late (herbaceous, shrubs, mature trees)

Indicators:

- Mudcracks
- Ripples
- Drift and/or debris
- Presence of bed and bank
- Benches
- Soil development
- Surface relief
- Other: sediment sorting
- Other: wrack
- Other: _____

Comments: scattered large trees, but mostly a bare channel devoid of vegetation from recent flow events. Lots of sediment sorting

Project ID: 22208 Cross section ID: OHW m 4 Date: 9/28/2012 Time: 0720

Floodplain unit: Low-Flow Channel Active Floodplain Low Terrace

GPS point: OHWM transect 4

Characteristics of the floodplain unit:

Average sediment texture: sand w/ more gravel + large cobbles

Total veg cover: 40 % Tree: 50 % Shrub: 35 % Herb: 15 %

Community successional stage:

- NA Mid (herbaceous, shrubs, saplings)
 Early (herbaceous & seedlings) Late (herbaceous, shrubs, mature trees)

Indicators:

- Mudcracks Soil development
 Ripples Surface relief
 Drift and/or debris Other: wrack
 Presence of bed and bank Other: _____
 Benches Other: _____

Comments: Large trees, late successional microphyll woodland

Floodplain unit: Low-Flow Channel Active Floodplain Low Terrace

GPS point: 33° 28' 16.646" N, 114° 47' 16.649" W

Characteristics of the floodplain unit:

Average sediment texture: gravel desert pavement w/ cobbles, silt, and sand

Total veg cover: 25 % Tree: 12.5 % Shrub: 75 % Herb: 12.5 %

Community successional stage:

- NA Mid (herbaceous, shrubs, saplings)
 Early (herbaceous & seedlings) Late (herbaceous, shrubs, mature trees)

Indicators:

- Mudcracks Soil development
 Ripples Surface relief
 Drift and/or debris Other: _____
 Presence of bed and bank Other: _____
 Benches Other: _____

Comments: creosote bush-dominated scrub with microphyll woodland closer to active floodplain, fading towards upland. No indicators observed

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Rio Mesa Solar EGF	Date: 9/27/2012	Time: 0900
Project Number: 22208	Town: SW of Blythe	State: CA
Stream: Green Wash / E Wash	Photo begin file#:	Photo end file#:
Investigator(s): JK, MT, TH, RB	R.B Camera 1749	1759

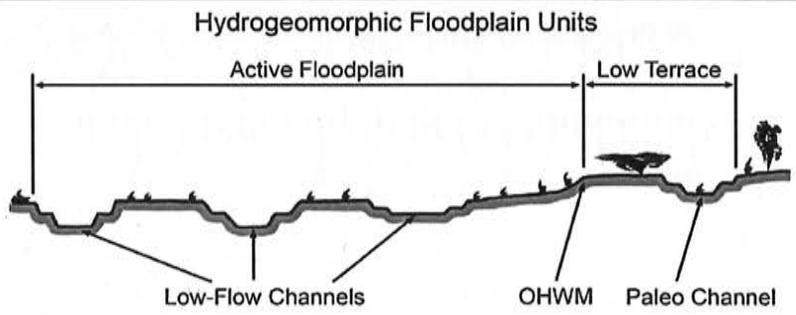
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?	Location Details: Green Wash close to N/S road crossing (road off Bradshaw Trail)
Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?	Projection: Datum: WGS 1984
Coordinates: 33° 29' 07.652" N 114° 46' 43.206" W	

Potential anthropogenic influences on the channel system:
Roads, Vehicles, OHV, Hunting, Trash

Brief site description: Microphyll woodland/creosote bush scrub active floodplain system

Checklist of resources (if available):

<input checked="" type="checkbox"/> Aerial photography	<input type="checkbox"/> Stream gage data
Dates:	Gage number:
<input checked="" type="checkbox"/> Topographic maps	Period of record:
<input type="checkbox"/> Geologic maps	<input type="checkbox"/> History of recent effective discharges
<input type="checkbox"/> Vegetation maps	<input type="checkbox"/> Results of flood frequency analysis
<input checked="" type="checkbox"/> Soils maps	<input type="checkbox"/> Most recent shift-adjusted rating
<input type="checkbox"/> Rainfall/precipitation maps	<input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event
<input checked="" type="checkbox"/> Existing delineation(s) for site	
<input checked="" type="checkbox"/> Global positioning system (GPS)	
<input type="checkbox"/> Other studies	

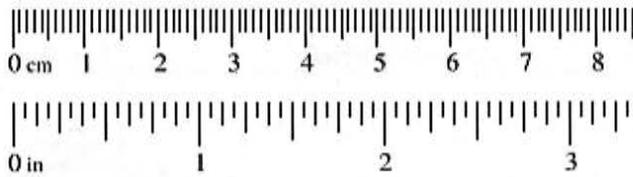


- Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**
- Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
 - Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
 - Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - Record the floodplain unit and GPS position.
 - Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - Identify any indicators present at the location.
 - Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
 - Identify the OHWM and record the indicators. Record the OHWM position via:

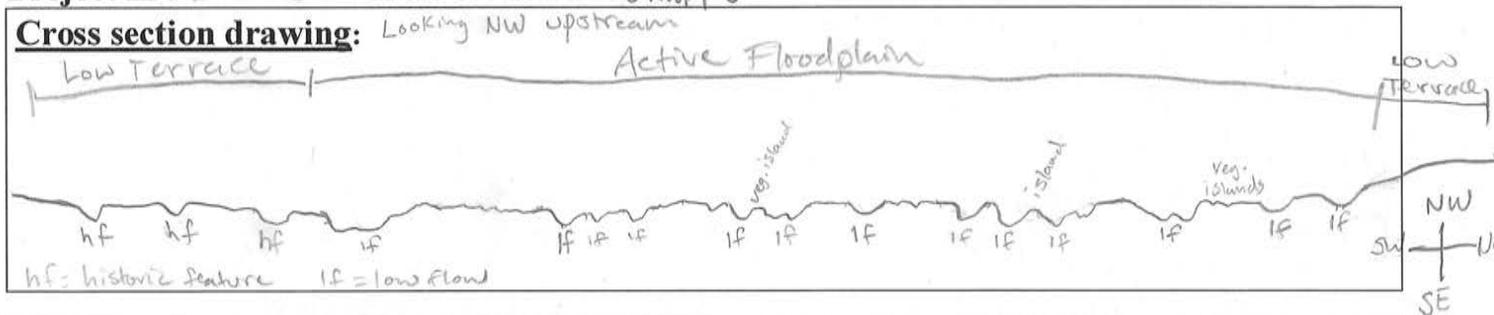
<input type="checkbox"/> Mapping on aerial photograph	<input checked="" type="checkbox"/> GPS
<input checked="" type="checkbox"/> Digitized on computer	<input type="checkbox"/> Other:

Wentworth Size Classes

Millimeters (mm)	Inches (in)	Wentworth size class
10.08	256	Boulder
2.56	64	Cobble
0.157	4	Pebble
0.079	2.00	Granule
0.039	1.00	Very coarse sand
0.020	0.50	Coarse sand
1/2 0.0098	0.25	Medium sand
1/4 0.005	0.125	Fine sand
1/8 0.0025	0.0625	Very fine sand
1/16 0.0012	0.031	Coarse silt
1/32 0.00061	0.0156	Medium silt
1/64 0.00031	0.0078	Fine silt
1/128 0.00015	0.0039	Very fine silt
		Clay



Project ID: 22208 Cross section ID: OHWM 5 Date: 9/27/12 Time: 0900



OHWM

GPS point: OHWM transect 5

Indicators:

<input checked="" type="checkbox"/> Change in average sediment texture	<input checked="" type="checkbox"/> Break in bank slope
<input type="checkbox"/> Change in vegetation species	<input type="checkbox"/> Other: _____
<input checked="" type="checkbox"/> Change in vegetation cover	<input type="checkbox"/> Other: _____

Comments:

Floodplain unit: Low-Flow Channel Active Floodplain Low Terrace

GPS point: OHWM transect 5

Characteristics of the floodplain unit:

Average sediment texture: Sand

Total veg cover: 5 % Tree: 3 % Shrub: <1 % Herb: 2 %

Community successional stage:

<input type="checkbox"/> NA	<input checked="" type="checkbox"/> Mid (herbaceous, shrubs, saplings) to late, some large
<input type="checkbox"/> Early (herbaceous & seedlings)	<input type="checkbox"/> Late (herbaceous, shrubs, mature trees) old trees

Indicators:

<input type="checkbox"/> Mudcracks	<input type="checkbox"/> Soil development
<input checked="" type="checkbox"/> Ripples	<input type="checkbox"/> Surface relief
<input type="checkbox"/> Drift and/or debris	<input checked="" type="checkbox"/> Other: <u>sediment sorting</u>
<input checked="" type="checkbox"/> Presence of bed and bank	<input checked="" type="checkbox"/> Other: <u>wrack</u>
<input checked="" type="checkbox"/> Benches	<input checked="" type="checkbox"/> Other: <u>scour</u>

Comments: Newly active channel, but large old microphyll trees, wrack accumulated around trees

Project ID: 22208

Cross section ID: OHWM 5

Date: 9/27/12

Time: 0900

Floodplain unit: Low-Flow Channel Active Floodplain Low Terrace

GPS point: OHWM Trsect 5

Characteristics of the floodplain unit:

Average sediment texture: Sand w/ gravel

Total veg cover: 60 % Tree: 25 % Shrub: 25 % Herb: 50 %

Community successional stage:

- NA
- Early (herbaceous & seedlings)
- Mid (herbaceous, shrubs, saplings)
- Late (herbaceous, shrubs, mature trees)

Indicators:

- Mudcracks
- Ripples
- Drift and/or debris
- Presence of bed and bank
- Benches
- Soil development
- Surface relief
- Other: wrack
- Other: sediment sorting
- Other: _____

Comments: Microphyll woodland present across, creosote bush scrub, lots of herbaceous plants: Bouteloua barbata, other forbs + grasses

Floodplain unit: Low-Flow Channel Active Floodplain Low Terrace

GPS point: OHWM Trsect 5

Characteristics of the floodplain unit:

Average sediment texture: Sand w/ gravel

Total veg cover: 60 % Tree: 5 % Shrub: 35 % Herb: 60 %

Community successional stage:

- NA
- Early (herbaceous & seedlings)
- Mid (herbaceous, shrubs, saplings)
- Late (herbaceous, shrubs, mature trees)

Indicators:

- Mudcracks
- Ripples
- Drift and/or debris
- Presence of bed and bank
- Benches
- Soil development
- Surface relief
- Other: _____
- Other: _____
- Other: _____

Comments: creosote bush-dominated scrub w/ significant herbaceous cover. No indicators observed.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Rio Mesa - Brightsource Energy	Date: 9/25/12	Time: 8am
Project Number: 22208	Town: ~ Palo Verde	State: CA
Stream: northern wash located in northern tower	Photo begin file#:	Photo end file#:
Investigator(s): AM	1	1

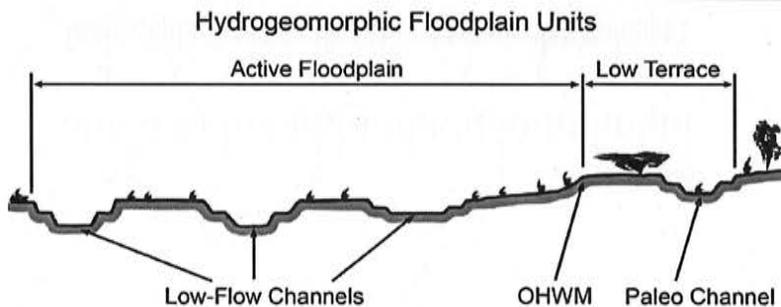
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?	Location Details: Wash located in northern portion of the northern tower impoundment (circle)
Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?	Projection: 33°28'17.238" N Datum:
	Coordinates: 114° 47' 28.838" W

Potential anthropogenic influences on the channel system:
 Earthen road located just south of wash system, but no anthropogenic influences noted. Some historic trash (i.e., tin cans) observed.

Brief site description: Large, braided wash system with many islands. Very good shelving and sediment sorting observed.

Checklist of resources (if available):

<input checked="" type="checkbox"/> Aerial photography	<input type="checkbox"/> Stream gage data
Dates:	Gage number:
<input type="checkbox"/> Topographic maps	Period of record:
<input type="checkbox"/> Geologic maps	<input type="checkbox"/> History of recent effective discharges
<input checked="" type="checkbox"/> Vegetation maps	<input type="checkbox"/> Results of flood frequency analysis
<input type="checkbox"/> Soils maps	<input type="checkbox"/> Most recent shift-adjusted rating
<input type="checkbox"/> Rainfall/precipitation maps	<input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event
<input checked="" type="checkbox"/> Existing delineation(s) for site	
<input checked="" type="checkbox"/> Global positioning system (GPS)	
<input type="checkbox"/> Other studies	



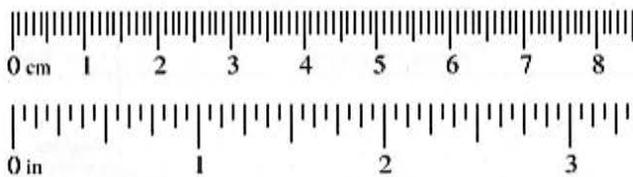
Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - a) Record the floodplain unit and GPS position.
 - b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

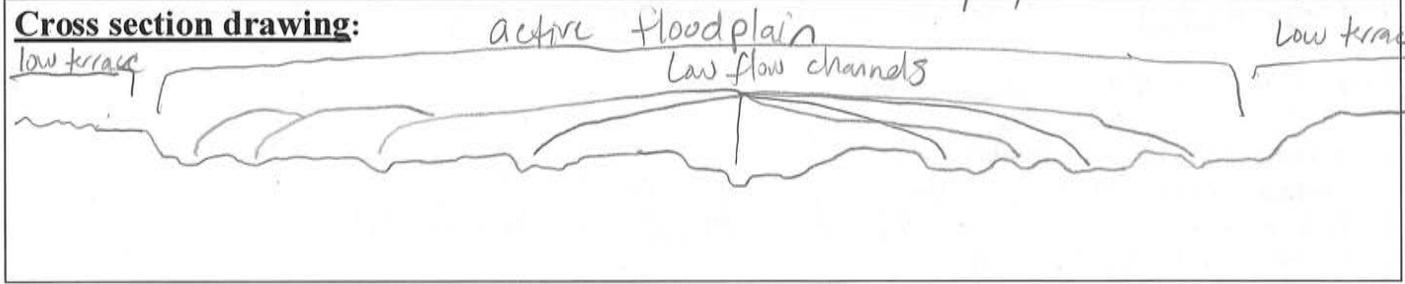
<input type="checkbox"/> Mapping on aerial photograph	<input checked="" type="checkbox"/> GPS
<input type="checkbox"/> Digitized on computer	<input type="checkbox"/> Other:

Wentworth Size Classes

Millimeters (mm)	Inches (in)	Wentworth size class
10.08	256	Boulder
2.56	64	Cobble
0.157	4	Pebble
0.079	2.00	Granule
0.039	1.00	Very coarse sand
0.020	0.50	Coarse sand
1/2 0.0098	0.25	Medium sand
1/4 0.005	0.125	Fine sand
1/8 0.0025	0.0625	Very fine sand
1/16 0.0012	0.031	Coarse silt
1/32 0.00061	0.0156	Medium silt
1/64 0.00031	0.0078	Fine silt
1/128 0.00015	0.0039	Very fine silt
		Clay



Project ID: 22208 ^{Bio mesa} Cross section ID: OHWM 6 Date: 9/25/12 Time: 8am



OHWM

GPS point: OHWM Transect 6

Indicators:

- | | |
|--|--|
| <input checked="" type="checkbox"/> Change in average sediment texture | <input type="checkbox"/> Break in bank slope |
| <input type="checkbox"/> Change in vegetation species | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Change in vegetation cover | <input type="checkbox"/> Other: _____ |

Comments: Large braided wash system approximately 700 feet wide (GPS'd both edges of system terrace)

Floodplain unit: Low-Flow Channel Active Floodplain Low Terrace

GPS point: OHWM Transect 6

Characteristics of the floodplain unit:

Average sediment texture: Sandy loam
Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- | | |
|---|--|
| <input checked="" type="checkbox"/> NA (no vegetation) | <input type="checkbox"/> Mid (herbaceous, shrubs, saplings) |
| <input type="checkbox"/> Early (herbaceous & seedlings) | <input type="checkbox"/> Late (herbaceous, shrubs, mature trees) |

Indicators:

- | | |
|--|--|
| <input checked="" type="checkbox"/> Mudcracks | <input type="checkbox"/> Soil development |
| <input checked="" type="checkbox"/> Ripples | <input type="checkbox"/> Surface relief |
| <input checked="" type="checkbox"/> Drift and/or debris | <input checked="" type="checkbox"/> Other: <u>Sediment sorting</u> |
| <input checked="" type="checkbox"/> Presence of bed and bank | <input type="checkbox"/> Other: _____ |
| <input checked="" type="checkbox"/> Benches | <input type="checkbox"/> Other: _____ |

Comments: Low flow channels with the wash system are well-defined by sediment sorting and topography/TOB. No vegetation within low-flow channel. Large rain event in August 2012 left clear indicators of OHWM.

Project ID: 2008 Cross section ID: OHWM 6 Date: 9/25/12 Time: 8am

Floodplain unit: Low-Flow Channel Active Floodplain Low Terrace

GPS point: OHWM Transect 6

Characteristics of the floodplain unit:

Average sediment texture: cobbly gravel
Total veg cover: 30 % Tree: 20 % Shrub: 10 % Herb: 2 %

Community successional stage:
 NA Mid (herbaceous, shrubs, saplings)
 Early (herbaceous & seedlings) Late (herbaceous, shrubs, mature trees)

Indicators:

- | | |
|---|--|
| <input type="checkbox"/> Mudcracks | <input type="checkbox"/> Soil development |
| <input type="checkbox"/> Ripples | <input type="checkbox"/> Surface relief |
| <input type="checkbox"/> Drift and/or debris | <input checked="" type="checkbox"/> Other: <u>Sediment sorting</u> |
| <input type="checkbox"/> Presence of bed and bank | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Benches | <input type="checkbox"/> Other: _____ |

Comments: Within the lower floodplain, clear sediment sorting and indicators of OHWM (terracing/shelving) create upland islands

Floodplain unit: Low-Flow Channel Active Floodplain Low Terrace

GPS point: OHWM transect 6

Characteristics of the floodplain unit:

Average sediment texture: Sandy loam
Total veg cover: 30 % Tree: 0 % Shrub: 25 % Herb: 5 %

Community successional stage:
 NA Mid (herbaceous, shrubs, saplings)
 Early (herbaceous & seedlings) Late (herbaceous, shrubs, mature trees)

Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Mudcracks | <input type="checkbox"/> Soil development |
| <input type="checkbox"/> Ripples | <input type="checkbox"/> Surface relief |
| <input type="checkbox"/> Drift and/or debris | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Presence of bed and bank | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Benches | <input type="checkbox"/> Other: _____ |

Comments: no indicators of OHWM in low terrace

APPENDIX C
URS (2012) DELINEATION



BrightSource

DOCKET

11-AFC-4

DATE FEB 09 2012

RECD. FEB 13 2012

February 9, 2012

Mr. Pierre Martinez, Project Manager for Rio Mesa Solar Project
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: BrightSource Energy, Inc. – Rio Mesa Solar Electric Generating Facility
Preliminary Jurisdictional Determination Acceptance

Dear Mr. Martinez:

BrightSource Energy, Inc. hereby submits the 2011 Preliminary Jurisdictional Determination Acceptance for the Rio Mesa Solar Electric Generating Facility.

If you have any questions, or need further clarification, please do not hesitate to call me at (510) 550-8908.

Sincerely,

Todd Stewart
Rio Mesa Solar Project Manager
BrightSource Energy, Inc.



October 7, 2011

James E. Mace, Senior Project Manager
U.S. Army Corps of Engineers, Riverside Regulatory Field Office
1451 Research Park Drive, Suite 100
Riverside, CA 92507-2154

Subject: BrightSource Energy Rio Mesa Solar Project: Methods for ACOE Proposed
Jurisdictional Drainage Delineation
URS Project No. 27651003

Dear Mr. Mace:

On behalf of BrightSource Energy Inc., URS Corporation Americas (URS) would like to provide these revised materials and documents necessary to make a jurisdictional determination regarding waters found on the Rio Mesa Solar Project site. The revisions are and along the eastern edge of the Project site where it was determined that some areas previously mapped as non-wetland are likely wetlands. The vast majority of these wetland areas are not impacted by the Project as currently planned. There were also some small changes to the mapping along the gen-tie line and Bradshaw Trail/34th Ave. access corridor. The following materials have been attached to this letter:

1. Methods for ACOE Jurisdictional Drainage Delineation Memo
2. Table 1 – Revised - Detailed Potential Jurisdictional Waters of the United States
3. Table 2 – Revised - Summary of Potential Waters of the United States
4. Figure 1 – ACOE Informally Agreed Waters of the U.S.- Project Site
5. Figure 2 – ACOE Informally Agreed Waters of the U.S.- Generator Tie-Line Corridor and Access Corridors
6. Revised - Preliminary Jurisdictional Determination Form

Please contact Derek Langsford at (858) 812-9292 or derek.langsford@urs.com (note new email address), if you have any questions.

Sincerely,

URS CORPORATION

Angela Leiba
Vice President

Derek Langsford
Biology Group Team Manager

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January 12, 2012

James E. Mace, Senior Project Manager
U.S. Army Corps of Engineers, Riverside Regulatory Field Office
1451 Research Park Drive, Suite 100
Riverside, CA 92507-2154

Subject: BrightSource Energy Rio Mesa Solar Project, Blythe, CA
Methods for ACOE Proposed Preliminary Jurisdictional Waters Delineation
URS Project No. 27651003

Dear Mr Mace:

On behalf of BrightSource Energy Inc., URS Corporation Americas (URS) provides this letter to document the methods used to delineate the preliminary jurisdictional waters found within the Rio Mesa Solar Project Biological Survey Area (BSA).

Areas considered and assessed as potential jurisdictional Waters of the United States (WUS) were based on wetland delineation practices that are in compliance with Section 404 of the Clean Water Act (CWA), Sections 9 and 10 of the Rivers and Harbors Act of 1899 (RHA), and Regulatory Guidance Letter No. 08-02 dated 26 June 2008. For the purposes of this Preliminary Jurisdictional Determination (PJD) it is assumed that all waters and wetlands that would be affected in any way by the proposed activity on the site could be jurisdictional waters of the U.S. The methodology to determine what is proposed jurisdictional involved the following criterion:

Ordinary High Water Mark (OHW): Areas with higher density vegetation, but lacking any of the OHWM characteristics, were eliminated as proposed jurisdictional waters, whereas proposed jurisdictional waters exhibited conditions indicative of OHWMs being present.

Features were considered proposed jurisdictional regardless of connectivity to the Colorado River, the nearest traditional navigable water (TNW).

The preliminary data review and site reconnaissance survey (January, 2011) identified numerous west to east trending ephemeral washes throughout the project site, including five large ephemeral washes trending west to east and west to south. Given the size of the study area and the myriad of potential features present, the characterization and mapping of these drainages was accomplished by a combination of field surveys and desktop mapping using high resolution aerial photographs. Eleven drainage systems were pre-chosen, using the high resolution aerial photographs, as representatives of typical ephemeral washes found throughout the site. These 11 drainage systems were chosen based on size, flow direction, connectivity, flow patterns, vegetation composition, topography, and USGS 'blue lines'.

James E. Mace
USACE
January 12, 2012
Page 2

The reviewed areas are represented by Drainage Identification letters, labeled A through I, gen-tie line ROW corridor, and Bradshaw Trail and 34th Avenue Access, for simplicity, and presented in Figures 1 and 2, and summarized in Table 1. Potential WUS on the project site were identified by URS personnel through review of existing documentation and verified during the field investigation. During the field investigation, URS biologists gathered information on the physical parameters such as topographic demarcation, soil characteristics, vegetation cover, and connectivity of drainages to the Colorado River. Aerial photographs at a scale of one inch equals 200 feet (VTN 2011), USGS 7.5-Minute Quadrangle Maps including the Thumb Peak, Palo Verde, Ripley, and Roosevelt Mine, and the USFWS's Wetland Mapper (National Wetlands Inventory [NWI], 2011) were used to identify potential wetland and water resources in the project area. A data search for previously delineated and mapped wetland and non-wetland WUS was conducted using the NWI website. A total of 8.30 acres of Bush seepweed (*Suaeda moquinii*) scrub wetlands, mapped on the NWI, occur within the BSA (Figure 1& 2). Metadata for this wetland acreage were not found on the NWI website. An additional site visit was conducted to collect additional data, soil type, plant species, and hydrology on the quality of the 8.30 acres of wetlands. A wetland determination data form (Arid West Region) was completed during the field visit. Similarities in the vegetation and hydrology of the area around this NWI identified seepweed wetland point expanded the area of proposed jurisdiction to a total of 117.78 acres of wetland WUS. A summary of findings is currently being developed and will be presented in a separate memo.

A site reconnaissance survey and preliminary assessment of water features were conducted April 18 through April 22, 2011. The total area surveyed was approximately 11,381 acres. Pedestrian surveys were conducted along the 11 drainages and included points representing locations in the middle of the drainage channel, OHWMs, locations of low and high banks, and the outer extent of vegetation typically associated with each drainage. Data were recorded using a Trimble® Geo-XT GPS. General characteristics of the wash, including average channel width, evidence of flow, and general vegetation were noted. URS biologists reported no observable surface water in the BSA at the time of the investigation, but they documented evidence of past recent surface water flows, including visible shelves and edges in washes, OHWMs, litter and debris, and vegetation disturbance. Other evidence observed was the heavy braiding of washes throughout the project site. URS biologists determined that most surface waters flowed southeast to Hodges Drain, which connects to the Palo Verde Outfall. This outfall flows into the Colorado River, which is identified as a TNW.

Field data were incorporated into a GIS for subsequent analysis and mapping. Data points collected along transect lines were plotted on recent aerial photographs having one to two foot resolution, and drainage features within the survey area were manually digitized into the GIS using the nearest reference location data to aid in the mapping. The area extending one mile from the site boundaries was qualitatively evaluated for the presence of wetlands and other waters and for possible indirect effects to waters adjacent to the project site. When determining drainage acreages using desktop mapping, categories such as 1-3 feet wide, 3-6 feet wide, 6-9 feet wide, 9-12 feet wide, 12-15 feet wide, and greater than 15 feet wide, were used to quantify the acreage. Acreage calculations assumed that 1-3 feet was 3 feet and 3-6 feet was 6 feet, etc. Prior to field surveys, this proposed methodology was discussed with USACE regulatory staff from the Los Angeles District (Pers. Comm. Jim Mace, 2011).

James E. Mace
USACE
January 12, 2012
Page 3

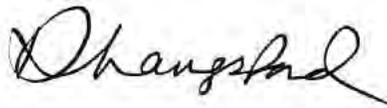
Based on the field data and aerial photograph interpretation, these drainage systems were delineated based on connectivity of the smaller delineated ephemeral washes to the five largest ephemeral drainages and/or connection to Hodges Drain to the east of the project site boundary (Figure 1). Features for each drainage system include single, large channels with well-defined bed and banks, as well as broad, but sometimes weakly expressed, assemblages of shallow braided ephemeral channels. A total of no more than 1,178.78 acres of potentially jurisdictional WUS were identified and mapped in the project area, with an additional 254.82 acres in the BSA. Table 1 shows the breakdown of each drainage system's total acreage. The majority of WUS on the Project site are non-wetland, the numbers in brackets [xx] in Table 1 are the wetland acreages included in the totals. Table 2 shows a summary of wetland and non-wetland proposed jurisdictional WUS.

Sincerely,

URS CORPORATION



Heather Rothbard
Staff Botanist/Wetland Scientist



Derek H. Langsford, PhD
Biological Resources Team Manager



James E. Mace
 USACE
 January 12, 2012
 Page 4

Table 1
Potential Jurisdictional WUS

Drainage Systems ¹	Drainage Size within the Project Site (acres)	500ft Buffer Area (acres)	Total Area (Project + Buffer) (acres)
A	17.31	7.01	24.32
B	127.84	17.26	145.10
C	9.88	1.17	11.05
D	6.52	0.98	7.50
E	191.62	44.86 [4.11] ²	236.48 [4.11]
F	6.20	7.62 [6.09]	13.82 [6.09]
G	419.85 [58.85]	75.69 [48.72]	495.54 [107.57]
H	141.53	50.05	191.58
I	238.28	50.20	288.48
Gen-tie line and ROW	9.05	³	9.05
Bradshaw Trail & 34th Ave Access	10.7	³	10.7
Totals	1,178.78 [58.85]	254.84 [58.93]	1433.62 [117.78]

¹ Drainage Divisions A through I are shown on Figure 1

² Numbers in parentheses designates wetland acreage included in total WUS

³ Acreage included in Project Site

Gen-tie line = Generator tie line

ROW=Right-of-Way

WUS = Waters of the United States under Section 404 and 401 of the Clean Water Act. Defined in the study area by Ordinary High Water Mark



James E. Mace
USACE
January 12, 2012
Page 5

Table 2
Summary of Potential Jurisdictional Wetland and Non-Wetland WUS in the BSA

Type	Existing within Project Site	Existing within Buffer Area	Existing Acres within BSA
Jurisdictional Waters of the United States (WUS)			
Wetland*	58.85	58.93	117.78
Non-wetland WUS	1,119.93	196.39	1,326.32
TOTAL			
United States Army Corps of Engineers (USACE) Jurisdiction	1,178.78	254.84	1,433.62

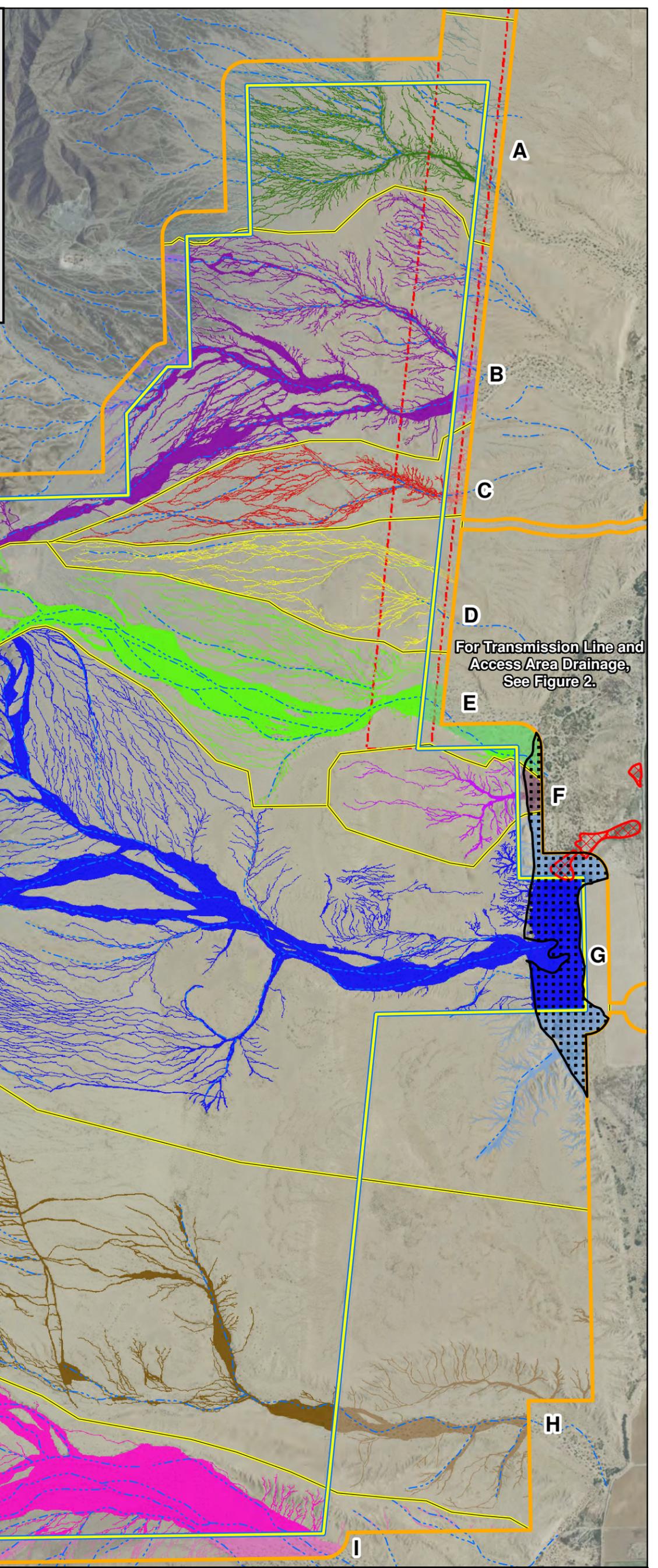
BSA = Biological Survey Area

WUS = Waters of the United States

* Wetland present included bush seepweed scrub and bush seepweed scrub/ mesquite bosque vegetation communities.

Biological Survey Area
 Project Site Boundary
 Transmission ROW Corridor
 Drainage Systems Division
 Wetland (58.93 ac. in Buffer, 58.85 ac. in Project)
 NWI Wetlands (8.03 ac. in Buffer, 0.27 ac. in Project)
--- USGS Blue Line

Drainage System within Project Boundary	Drainage System within Survey Buffer
 A 17.31 ac.	 A 7.01 ac.
 B 127.84 ac.	 B 17.26 ac.
 C 9.88 ac.	 C 1.17 ac.
 D 6.52 ac.	 D 0.98 ac.
 E 191.62 ac.	 E 44.86 ac.
 F 6.20 ac.	 F 7.62 ac.
 G 419.85 ac.	 G 75.69 ac.
 H 141.53 ac.	 H 50.05 ac.
 I 238.28 ac.	 I 50.20 ac.

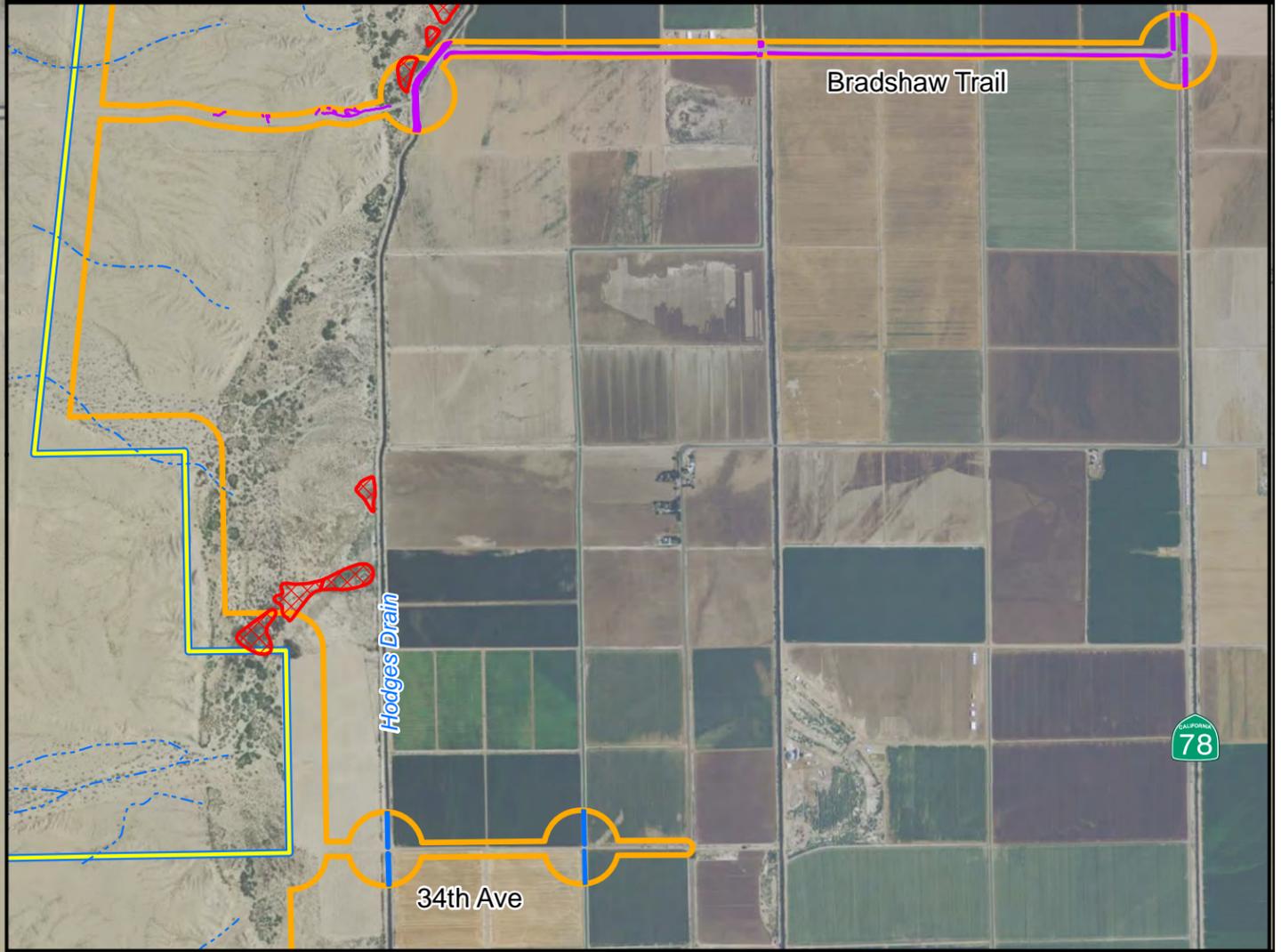


For Transmission Line and Access Area Drainage, See Figure 2.

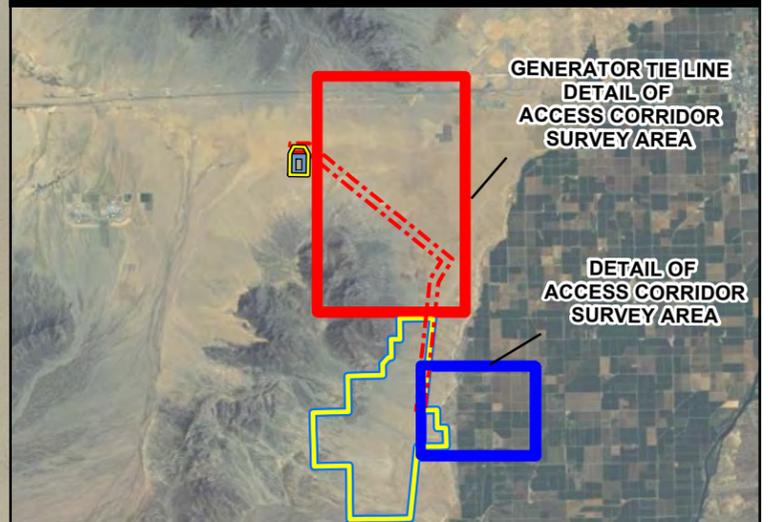
Path: \\082-GIS\GIS\gis\projects\15772765\002\map_docs\mxd\AFCUD_WatersAgency_Submittal\SAOE_Project_Area.mxd, David_Trecek, 10/7/2011, 2:21:19 PM

 	<p>SOURCES: Draft Solar Field Layout & Fenceline (Bechtel, 8-03-2011). Project Site, Transmission Line Corridor (VTN, 3-15-2011). Aerial Imagery (NAIP, 5-25-2009). USGS Blue Lines (USGS, 2009). NWI Wetlands (U.S. Fish & Wildlife Service, 2011). ACOE Informally Agreed Waters of the U.S., Drainage Systems Division, Biological Survey Area (URS, 2011).</p>		<p>ACOE INFORMALLY AGREED WATERS OF THE U.S. PROJECT SITE RIO MESA SOLAR ELECTRIC GENERATING FACILITY</p>	
	<p>1100 0 1100 2200 Feet</p> <p>SCALE: 1" = 2,200' (1:26,400) SCALE CORRECT WHEN PRINTED AT 11X17</p>	<p>CREATED BY: DT</p> <p>PM: AL</p>	<p>DATE: 10/7/2011</p> <p>PROJ. NO: 27651006.50506</p>	<p>FIG. NO: 1</p>

DETAIL OF ACCESS CORRIDOR SURVEY AREA



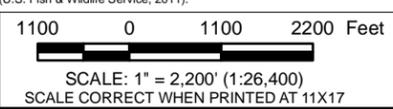
OVERVIEW OF PROJECT SITE



- Transmission Line Corridor Drainage (9.05 ac.)
- Bradshaw Trail Drainage (9.04 ac.)
- 34th Ave Access Drainage (1.66 ac.)
- NWI Wetlands (8.03 ac. in Buffer, 0.27 ac. in Project)
- Biological Survey Area
- Transmission ROW Corridor
- Project Site Boundary
- USGS Blue Line



SOURCES: Project Site, Transmission Line Corridor (VTN, 3-15-2011)
 Aerial Imagery (NAIP, 5-25-2009)
 USGS Blue Lines (USGS, 2009)
 ACOE Informally Agreed Waters of the U.S.,
 Drainage Systems Division, Biological Survey Area (URS, 2011).
 NWI Wetlands (U.S. Fish & Wildlife Service, 2011).



ACOE INFORMALLY AGREED WATERS OF THE U.S.
 GENERATOR TIE LINE CORRIDOR AND ACCESS CORRIDORS
 RIO MESA SOLAR
 ELECTRIC GENERATING FACILITY

CREATED BY: DT	DATE: 10/6/2011	FIG. NO:
PM: AL	PROJ. NO: 27651005.50506	2

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PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there "may be" waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

District Office	Los Angeles District	File/ORM #	SPL-2011-00972-SEM	PJD Date:	Oct 7, 2011
State	CA	City/County	Palo Verde Mesa, Riverside County		
Nearest Waterbody:	Colorado River				
Location: TRS, Lat/Long or UTM:	San Bernardino Meridian: T8S R21E S1-3, 9-11, 14-16, 20-23, 26-29, 33-35. T7S R21E S14-16, 23, 26, 35				
Name/Address of Person Requesting PJD	Derek H. Langsford, PhD, CSE Biological Resources Team Manager URS Corporation 4225 Executive Square, Suite 1600 La Jolla, CA 92037 Phone: (858) 812-9292, ext. 1563				

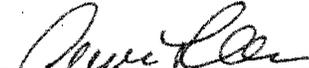
Identify (Estimate) Amount of Waters in the Review Area:	Name of Any Water Bodies on the Site Identified as
Non-Wetland Waters: 272530 linear ft <math>< 1/4</math> width 1315.85 acres Stream Flow: Ephemeral	Tidal: N/A Section 10 Waters: Non-Tidal: N/A
Wetlands: 117.78 acre(s) Cowardin Class: Palustrine, scrub-shrub	<input checked="" type="checkbox"/> Office (Desk) Determination <input checked="" type="checkbox"/> Field Determination: Date of Field Trip: Apr 20, 2011

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: URS Corporation
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
- Data sheets prepared by the Corps
- Corps navigable waters' study: _____
- U.S. Geological Survey Hydrologic Atlas:
 - USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite quad name: Palo Verde
- USDA Natural Resources Conservation Service Soil Survey. Citation: websoilsurvey.nrcs.usda.gov Colorado Desert Area
- National wetlands inventory map(s). Cite name: fws.gov/wetlands/Data/Mapper.html
- State/Local wetland inventory map(s): californiawetlands.net/tracker/crb/map
- FEMA/FIRM maps: 06025C0275C
- 100-year Floodplain Elevation is: _____
- Photographs:
 - Aerial (Name & Date): VTN Consulting, 2011
 - Other (Name & Date): _____
- Previous determination(s). File no. and date of response letter: _____
- Other information (please specify): VTN Consulting, 2011. Draft Rio Mesa Overall EIR

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.


 Signature and Date of Regulatory Project Manager
 (REQUIRED)


 Signature and Date of Person Requesting Preliminary JD
 (REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there "may be" waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Appendix A - Sites

District Office	Los Angeles District	File/ORM #	SPL-2011-0972-JEM	PJD Date:	Oct 7, 2011
State	CA	City/County	Palo Verde/Riverside	Person Requesting PJD	Derek Langsford

Site Number	Latitude	Longitude	Cowardin Class	Est. Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
Wetlands	*****	see Figure 1	Palustrine, scrub-shrub	117.78 acres	Non-Section 10 wetland
A	*****	see Figure 1	Riverine	24.32 acres	Non-Section 10 non-wetland
B	*****	see Figure 1	Riverine	145.10 acres	Non-Section 10 non-wetland
C	*****	see Figure 1	Riverine	11.05 acres	Non-Section 10 non-wetland
D	*****	see Figure 1	Riverine	7.48 acres	Non-Section 10 non-wetland
E	*****	see Figure 1	Riverine	232.35 acres	Non-Section 10 non-wetland

Notes:

*****Please see attached Figure number 11a and 11b, showing locations of Site Numbers labeled as Sections A thru I, Gen-tie and ROW corridors, and Bradshaw Trail and 34th Avenue Access.

Continued Sections from List above:

F: 7.73 acres, ***** see Figure 1, Riverine, Non-Section 10 non-wetland

G: 388.02 acres, ***** see Figure 1, Riverine, Non-Section 10 non-wetland

H: 191.58 acres, ***** see Figure 1 Riverine, Non-Section 10 non-wetland

I: 288.48 acres, ***** see Figure 1, Riverine, Non-Section 10 non-wetland

Gen-tie/ROW corridor: 9.05 acres, ***** see Figure 2, Riverine, Non-Section 10 non-wetland

Bradshaw Trail/34th Ave Access: 10.70 acres, ***** see Figure 2, Riverine, Non-Section 10 non-wetland



BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
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**APPLICATION FOR CERTIFICATION
FOR THE RIO MESA SOLAR
ELECTRIC GENERATING FACILITY**

DOCKET NO. 11-AFC-04
PROOF OF SERVICE
(Revised 1/23/12)

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*indicates change

DECLARATION OF SERVICE

I, Michelle L. Farley, declare that on, February 9, 2012 I served and filed copies of the attached Preliminary Jurisdictional Determination Acceptance for the Rio Mesa Solar Electric Generating Facility, dated February 8, 2012. These documents are accompanied by the most recent Proof of Service list, located on the web page for this project at:

[<http://www.energy.ca.gov/sitingcases/riomesa/index.html>].

These documents have been sent to the other parties in this proceeding (as shown on the attached Proof of Service list) and to the Commission's Docket Unit or Chief Counsel, as appropriate, in the following manner:

(Check all that Apply)

For service to all other parties:

- Served electronically to all e-mail addresses on the Proof of Service list;
- Served by delivering on this date, either personally, or for mailing with the U.S. Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses **NOT** marked "e-mail preferred."

AND

For filing with the Docket Unit at the Energy Commission:

- by sending electronic copies to the e-mail address below (preferred method); **OR**
- by depositing an original and 12 paper copies in the mail with the U.S. Postal Service with first class postage thereon fully prepaid, as follows:

CALIFORNIA ENERGY COMMISSION – DOCKET UNIT
Attn: Docket No. 11-AFC-4
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

OR, if filing a Petition for Reconsideration of Decision or Order pursuant to Title 20, § 1720:

- Served by delivering on this date one electronic copy by e-mail, and an original paper copy to the Chief Counsel at the following address, either personally, or for mailing with the U.S. Postal Service with first class postage thereon fully prepaid:

California Energy Commission
Michael J. Levy, Chief Counsel
1516 Ninth Street MS-14
Sacramento, CA 95814
mlevy@energy.state.ca.us

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Michelle L. Farley
BrightSource Energy, Inc.

APPENDIX D
REPRESENTATIVE PHOTOS



*Appendix D. Representative Photographs –
Typical Observed Indicators of OHWM*
Top: Mudcracks
Bottom: Benches



Photographs taken September 20-24, 2012



*Appendix D. Representative Photographs –
Typical Observed Indicators of OHWM*
Top: Drift and wrack deposition
Bottom: Mudcracks



Photographs taken September 20-24, 2012



*Appendix D. Representative Photographs –
Typical Observed Indicators of OHWM*
Top: Benches, wrack deposition, exposed roots
below soil layer
Bottom: Wrack deposition
Photographs taken September 20-24, 2012





*Appendix D. Representative Photographs –
Typical Observed Indicators of OHWM*
Top: Benching
Bottom: Crested ripples

Photographs taken September 20-24, 2012





Appendix D. Representative Photographs – Typical Observed Indicators of OHWM

Top: Crested ripples, change in particle distribution
Bottom: Change in particle size distribution

Photographs taken September 20-24, 2012





Appendix D. Representative Photographs - Wetlands

Top: Sediment layering visible in soil profile at SP1.

Bottom: Faint and indistinct redox concentrations observed at SP1.

Photographs taken September 20-24, 2012





Appendix D. Representative Photographs - Wetlands

Top: Vegetation dominated by bush seepweed.

Bottom: Wetland/upland edge. Wetland is dominated by bush seepweed.

Photographs taken September 20-24, 2012





Appendix D. Representative Photographs - Wetlands

Top: Typical wetland hydrology indicators observed in the wetlands: surface soil cracking.

Bottom: Drift and debris south of the wetland shows flows from Wash 25B entering wetland.

Photographs taken September 20-24, 2012





*Appendix D. Representative Photographs –
Potentially Jurisdictional Dry Washes*
Top: Blue palo verde – ironwood woodland
Bottom: Terrace floodplain surrounded by
active floodplain in a large wash system
Photos taken September 20-24, 2012





*Appendix D. Representative Photographs –
Potentially Jurisdictional Dry Washes*

Top: Shelving, sediment sorting and wrack
present in a large wash.

Bottom: Sediment sorting and crested ripples
present in the low flow channel.

Photos taken September 20-24, 2012





*Appendix D. Representative Photographs -
Features Lacking OHWM*
Top and Bottom: Relict channel, no evidence of
recent flow, No OHWM.

Photographs taken September 20-24, 2012





*Appendix D. Representative Photographs -
Features Lacking OHWM*

Top: Relict channel, no evidence of recent flow,
No OHWM.

Bottom: Surface sheet flow. No OHWM.

Photographs taken September 20-24, 2012





*Appendix D. Representative Photographs -
Features Lacking OHWM*
Top and Bottom: Relict channel, no evidence of
recent flow, No OHWM.

Photographs taken September 20-24, 2012





*Appendix D. Representative Photographs -
Features Lacking OHWM*

Top: Surface sheet flow, no OHWM.

Bottom: Relict channel, no evidence of recent
flow, No OHWM.

Photographs taken September 20-24, 2012



**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

**Applicant's General Comments and Comments to Conditions of Certification
on the Preliminary Staff Assessment**

TRAFFIC AND TRANSPORTATION

GENERAL COMMENTS

1. Applicant has prepared a study evaluating a double shift option to lessen LOS impacts at key intersections. Please see Appendix Traffic and Transportation 1.
2. Applicant has provided comments on glint and glare within the Visual Section and is continuing to develop specific comments related to PSA Appendix TT 1, which will be filed at a later time.

FINDINGS OF FACT

No findings of fact listed are listed in this section of the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

1. **Page 4.11-35, Condition of Certification TRANS-1:** To report all permits in the MCC is unnecessary and burdensome paperwork. If the permits are available for inspection on-site, the additional reporting is unnecessary. Applicant requests that the verification language of the condition be revised as follows :

TRANS 1 Roadway Use Permits and Regulations

The project owner shall comply with limitations imposed by the Department of Transportation (Caltrans) District 8 and other relevant jurisdictions, including the City of Blythe and the County of Riverside, on vehicle sizes and weights, driver licensing, and truck routes. In addition, the project owner or its contractor(s) shall obtain necessary transportation permits for roadway use from all relevant jurisdictions.

Verification: ~~In the Monthly Compliance Reports (MCRs), the project owner shall report permits received during that reporting period. In addition, The project owner shall retain copies of contracts requiring all haulers to maintain all necessary permits, and supporting documentation on-site for compliance project manager (CPM) inspection if requested.~~

2. **Page 4.11-36, Condition of Certification TRANS-2:** As discussed above in Specific Comment # 9, Applicant recommends that the requirement for a bussing plan be deleted from this condition. Please revise the condition as follows:

Rio Mesa Solar Electric Generating Facility (RMSEGF) (11-AFC-4)

Applicant's Comments on the Preliminary Staff Assessment

TRANS-2 Traffic Control Plan, Heavy Haul Plan, and Parking/Staging Plan

Prior to the start of construction of the Rio Mesa SEGF, the project owner shall prepare a Traffic Control Plan (TCP) for the Rio Mesa SEGF's construction and operations traffic. The TCP shall address the movement of workers, vehicles, and materials, including arrival and departure schedules and designated workforce and delivery routes.

The project owner shall consult with the Department of Transportation (Caltrans) District 8 office, the County of Riverside, and the City of Blythe in the preparation and implementation of the Traffic Control Plan (TCP). The project owner shall submit the proposed TCP to these agencies in sufficient time for review and comment, and to the CPM for review and approval prior to the proposed start of construction and implementation of the plan.

The TCP shall include:

- ~~A coordinated park and ride plan designed to transport construction workers to the project site via a van or bus service to reduce impact to LOS. This plan must include the park and ride location/s and evidence that the location/s may be used for this purpose (lease agreements, etc.), the schedule for each van or bus departure to and from the site, and ways in which the park and ride system will be enforced (how employees will be notified, etc.)~~
- The project will explore the potential for traffic mitigation strategies such as:
 - Staggered morning and evening shifts a half hour to an hour
 - Evening shift
 - Preferred parking for workers who carpool similar to program at Ivanpah Solar Electric Generating Facility project in San Bernardino County.
 - Implement a web based ride share program
- Provisions for redirection of construction traffic with a flag person as necessary to ensure traffic safety and minimize interruptions to non-construction related traffic flow;
- Placement of necessary signage, lighting, and traffic control devices at the project construction site and lay-down areas;
- A heavy-haul plan addressing the transport and delivery of heavy and oversized loads requiring permits from the California Department of Transportation (Caltrans), other state or federal agencies, and/or the affected local jurisdictions;
- Location and details of construction along affected roadways at night, where permitted;
- Details regarding temporary closure of travel lanes or disruptions to street segments and intersections during construction activities;

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

Applicant's Comments on the Preliminary Staff Assessment

- Traffic diversion plans (in coordination with Caltrans, the County of Riverside, and the City of Blythe) to ensure access during temporary lane/road closures;
- Means of access to residential and/or commercial property located near construction work and truck traffic routes;
- Means of access for emergency vehicles to the project site;
- Advance notification to residents, businesses, emergency providers, and hospitals that would be affected when roads may be partially or completely closed;
- Routes used for construction-related trips;
- Timing of construction-related trips, with trips scheduled for off-peak hours if possible;
- Identification of safety procedures for exiting and entering the site access gate; and
- Parking/Staging Plan (PSP) for all phases of project construction and for project operation. The PSP must comply with Riverside County's parking regulations by providing sufficient on-site parking.

3. **Page 4.11-37, Condition of Certification TRANS-3:** Applicant requests that the condition be modified as follows:

TRANS-3: The project owner shall restore public roads, easements, rights-of-way, and Palo Verde Irrigation District infrastructure (such as canals and drains) related to the specific access roads listed below that have been damaged due to project-related construction activities.

- Bradshaw Trail west of SR 78 to project entrance inclusive of canal and drain crossings
- Secondary access west of SR 78 inclusive of canal and drain crossings

Restoration shall be completed in a timely manner to the infrastructure's ~~original~~ condition as it existed immediately prior to the start of site mobilization. Restoration of project-related significant damage which could cause hazards to vehicles (such as potholes, deterioration of pavement edges, or damaged signage) shall take place ~~immediately~~ promptly after the damage has occurred. Restoration of any project-related significant damage to Palo Verde Irrigation District infrastructure, such as canals or drains, shall ~~also~~ take place immediately after the damage has occurred.

Prior to the start of site mobilization, the project owner shall notify the relevant jurisdictions, including Caltrans District 8, the City of Blythe, the County of Riverside, and the Palo Verde Irrigation District of the proposed schedule for project construction. ~~The purpose of this notification is to~~

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

Applicant's Comments on the Preliminary Staff Assessment

~~request that these jurisdictions consider postponement of any planned public right-of-way repairs or improvement activities in areas affected by project construction until construction is completed, and to coordinate any concurrent construction-related activities that cannot be postponed.~~

Verification: Prior to the start of site mobilization, the project owner shall photograph or videotape ~~all~~ the affected public roads, easements, right-of-way segment(s), and intersections for the specific access roads listed in the condition. The project owner shall provide the photographs or videotapes to the CPM and the affected local agencies (such as Caltrans District 8, the City of Blythe, and the County of Riverside).

If damage to the public roads, easements, rights-of-way, or Palo Verde Irrigation District infrastructure described in the condition occurs during construction, the project owner shall notify the CPM and the affected agency/agencies to identify the sections to be repaired. At that time, the project owner and CPM shall establish a schedule for completion and approval of the repairs. Following completion of any repairs, the affected local agency may inform the CPM whether the repairs have restored the roadway to the condition prior to site mobilization. ~~project owner shall provide the CPM with letters signed by the affected agency/agencies stating their satisfaction with the repairs.~~

4. **Page 4.11-38, Proposed Conditions of Certification TRANS-4:** As discussed above in Specific Comment 9, the Commission has pre-emptive authority over all otherwise applicable local permits, including encroachment permits. Therefore, the CBO should exercise the same review and approval authority for encroachment permits as is done for building permits or other local permits. Applicant recommends that TRANS-4 be deleted in its entirety.

~~TRANS 4 — Encroachment into Public Rights of Way~~

~~Prior to any ground disturbance, improvements, or obstruction of traffic within any public road, easement, or right-of-way, the project owner shall coordinate with all applicable jurisdictions, including Caltrans District 8, the County of Riverside, and the City of Blythe, to obtain necessary encroachment permits and comply with all applicable regulations, including applicable road standards.~~

~~Verification:~~ ~~At least 10 days prior to ground disturbance, improvements, or interruption of traffic in or along any public road, easement, or right-of-way, the project owner shall provide copies of all permit(s), relevant to the affected location(s), received from Caltrans or any other affected jurisdiction/s to the CPM. In addition, the project owner shall retain copies of the issued/approved permit(s) and supporting documentation in its compliance file for a minimum of 180 calendar days after the start of commercial operation.~~

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

Applicant's Comments on the Preliminary Staff Assessment

5. **Page 4.11-38, Proposed Conditions of Certification TRANS-5:** Applicant requests that the verification language of the condition be revised as follows:

TRANS-5: The project owner shall contract with licensed hazardous materials delivery and waste hauler companies in order to obtain the necessary permits and/or licenses from the California Highway Patrol, Caltrans District 8, and any relevant local jurisdictions for the transportation of hazardous materials. The project owner shall ensure compliance with all applicable regulations and implementation of the proper procedures.

Verification: ~~In the Monthly Compliance Reports (MCRs) during construction and the Annual Reports during operation, the owner shall provide copies of all permits/licenses obtained for the transportation of hazardous materials.~~ The project owner shall retain copies of permits and supporting documentation on-site for compliance project manager (CPM) inspection if requested.

At least 30 days prior to the start of construction, the project owner shall provide copies of any comment letters received from the relevant agencies , along with any resulting changes in plans for transportation of hazardous materials.

6. **Page 4.11-39, Proposed Conditions of Certification TRANS-7:** Applicant requests that the verification language of the condition be revised as follows:

TRANS-7: The project owner shall install obstruction marking and lighting on the two solar power towers and any construction cranes exceeding 200 feet in height. Marking and lighting shall be consistent with FAA requirements, as expressed in the following documents:

- FAA Advisory Circular 70/7460-1K Change 2, Obstruction Marking and Lighting, a med-dual system – Chapters 4, 8 (M-Dual), and 12.
- FAA Safety Alert for Operators (SAFO) 09007. Permanent lighting consistent with all requirements shall be installed and activated within 5 days of completion of construction and prior to the start of plant operation. Lighting shall be operational 24 hours a day, 7 days a week for the life of project operation. Upgrades to the required lighting configurations, types, location, or duration shall be implemented consistent with any changes to FAA obstruction marking and lighting requirements.

Verification: At least 60 days prior to the start of construction of the solar power towers, the project owner shall submit to the CPM for approval final design plans for the two solar power towers that depict the required air traffic obstruction marking and lighting.

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

Applicant's Comments on the Preliminary Staff Assessment

Within 5 days of completion of solar power tower construction and prior to the start of plant operation, the project owner shall install and activate permanent obstruction marking and lighting consistent with FAA requirements and shall inform the CPM in writing within 10 days of installation and activation. The lighting shall be inspected and approved by the CPM (or designated inspector) within 30 days of activation.

Appendix Traffic and Transportation 1

Appendix Traffic and Transportation 1

**Table 1
Double Shift Option**

	7-9 AM Peak Hour			4-6 PM Peak Hour		
First shift – daytime (75% of employees)						
10-hour shift (with a ½ hour for lunch):						
Work Shift Breakdown	AM Peak Hour Commute?	In	Out	PM Peak Hour Commute?	In	Out
5 AM – 3:30 PM (Traveling during peak evening hours) (10% of first shift)	No	0	0	No	0	137
6 AM – 4:30 PM (Traveling during peak evening hours) (50% of first shift)	No	0	0	Yes	0	514 ¹
7 AM – 5:30 PM (Traveling during peak morning hours, but departing at end of peak evening hours) (40% of first shift)	No	0	0	Yes	0	343
Second shift – evening (25% of employees)						
10-hour shift (with a ½ hour for break):						
Work Shift Breakdown	AM Peak Hour Commute?	In	Out	PM Peak Hour Commute?	In	Out
4 PM – 2:30 AM (Arriving during peak evening hours)	No	0	0	Yes	0	0
5 PM – 3:30 AM (Arriving during peak evening hours)	No	0	0	Yes	0	0
6 PM – 4:30 AM (Arriving during peak evening hours)	No	0	0	Yes	343 ²	0

Source: Bechtel Power Corporation, Forecast Traffic Impact - Rio Mesa_052412_On Site Batch Plant Rev 2.xls

¹ Peak workforce was conservatively analyzed at 1370 worker vehicle trips during peak month of construction. 55% of these worker vehicle trips were assumed to commute during the morning (7-9 AM) and evening (4-6 PM) peak hours.

² Delivery vehicles were adjusted into Passenger Car Equivalent (1 Heavy Vehicle = 3 PCE) vehicle in the traffic impact analysis. Analysis assumed 50 percent of 8 (actual trucks) delivery vehicles arrive and 25 percent leave during the 7 to 9 AM peak hour; 25 percent leave during the 4 to 6 PM peak hour. Numbers shown on the table are passenger car equivalent adjusted.

Appendix Traffic and Transportation 1

Table 2
Project Construction Trip Generation
Month 22 – May 2015 (Peak Month Analyzed in Environmental Enhancement Proposal 2012)
Includes Double Shift Worker Schedule

Vehicle Type	Peak Daily Round Trips	AM Peak Trips			PM Peak Trips		
		Inbound	Outbound	Total	Inbound	Outbound	Total
Construction Worker Vehicles ¹	2740	35 ³	0	0	343	514	857
Delivery Vehicles (including heavy trucks) ²	48	12	6	18	0	6	6

Source: Bechtel Power Corporation, Forecast Traffic Impact - Rio Mesa_052412_On Site Batch Plant Rev 2.xls

¹ Peak workforce was conservatively analyzed at 1370 worker vehicle trips during peak month of construction. Incorporating a proposed double shift schedule, during the first shift (day) 35 worker vehicle trips were assumed to commute inbound during the morning (7-9 AM) while the majority of the first shift (day) workers will commute and arrive on-site beforehand. During the evening (4-6 PM) peak hours, there will be an overlap of incoming second shift worker vehicle trips and outbound first shift worker leaving the project site and is reflected in the inbound and outbound trips described above.

² Delivery vehicles were adjusted into Passenger Car Equivalent (1 Heavy Vehicle = 3 PCE) vehicle in the traffic impact analysis. Analysis assumed 50 percent of 8 (actual trucks) delivery vehicles arrive and 25 percent leave during the 7 to 9 AM peak hour; 25 percent leave during the 4 to 6 PM peak hour. Numbers shown on the table are passenger car equivalent adjusted.

³ "Non-physical labor" employees commuting during the AM Peak hour. BrightSource 10-18-2012.

Appendix Traffic and Transportation 1

Table 3
Peak Hour Intersection LOS
Year 2015 Project Construction Conditions – with Double Shift Analysis

INTERSECTION	A.M. Peak Hour		P.M. Peak Hour	
	Average Delay (sec)	LOS	Average Delay (sec)	LOS
1. SR-78 (Neighbours Boulevard)/I-10 WB Ramps	9.1	A	12.7	B
2. SR-78 (Neighbours Boulevard)/I-10 EB Ramps	8.9	A	9.9	A
3. SR-78 (Neighbours Boulevard)/22nd Avenue	9.5	A	13.0	B
4. SR-78 (Neighbours Boulevard)/28 th Avenue	7.0	A	14.7	B
5. SR-78 (Rannells Boulevard)/28th Avenue	7.3	A	13.8	B
6. SR-78/30 th Avenue	9.0	A	19.7	C
7. SR-78/34 th Avenue	7.3	A	11.8	B
8. Lovekin Boulevard/I-10 WB Ramps	10.6	B	9.0	A
9. Lovekin Boulevard/I-10 EB Ramps	8.3	A	11.5	B
10. Lovekin Boulevard/14 th Avenue	8.1	A	10.8	B
11. Lovekin Boulevard/16 th Avenue	7.5	A	9.2	A

Appendix Traffic and Transportation 1

Rio Mesa SEGF Double Shift Traffic Modeling Worksheets

Rio Mesa Solar Electric Generating Facility (SEGF)
Near Term PM Peak Hour Conditions - with Peak Project Construction
With Second Shift Analysis

Scenario Report

Scenario: NTPMWP Rev

Command: NTPMWP
Volume: NTPM
Geometry: EXISTING
Impact Fee: Default Impact Fee
Trip Generation: Construction PM
Trip Distribution: Trip Distribution
Paths: Default Paths
Routes: Default Routes
Configuration: Default Configuration

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term PM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Trip Generation Report

Forecast for PM Construction

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
2	Construction	1.00	Construction	343.00	514.00	343	514	857	99.3
	Zone 2 Subtotal					343	514	857	99.3
3	Construction	1.00	Materials Truc	0.00	3.00	0	3	3	0.3
	Zone 3 Subtotal					0	3	3	0.3
4	Construction	1.00	Equipment Truc	0.00	3.00	0	3	3	0.3
	Zone 4 Subtotal					0	3	3	0.3
TOTAL						343	520	863	100.0

 Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term PM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Impact Analysis Report
 Level Of Service

Intersection	LOS	Base		LOS	Future		Change in
		Del/ Veh	V/ C		Del/ Veh	V/ C	
# 1 SR-78 (Neighbours Boulevard)/I	A	9.1	0.000	B	12.7	0.000	+ 3.588 D/V
# 2 SR-78 (Neighbours Boulevard)/I	A	9.2	0.000	A	9.9	0.000	+ 0.674 D/V
# 3 SR-78/22nd Ave	A	9.4	0.000	B	13.0	0.000	+ 3.629 D/V
# 4 Neighbours (SR-78)/28th Ave	A	7.1	0.047	B	14.7	0.717	+ 0.669 V/C
# 5 Ramells (SR-78)/28th Ave	A	7.0	0.027	B	13.8	0.640	+ 0.613 V/C
# 6 SR-78/30th Avenue	A	0.0	0.000	C	19.7	0.000	+19.717 D/V
# 7 SR-78/34th Avenue	A	0.0	0.000	B	11.8	0.000	+11.788 D/V
# 8 Lovekin/I-10 WB ramps	B	10.0	0.135	A	9.0	0.249	-1.026 D/V
# 9 Lovekin/I-10 EB ramps	B	10.5	0.189	B	11.5	0.266	+ 1.046 D/V
# 10 Lovekin/14th	A	8.1	0.105	B	10.8	0.449	+ 0.344 V/C
# 11 Lovekin/16th-Seeley	A	7.3	0.039	A	9.2	0.364	+ 0.326 V/C

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term PM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #1 SR-78 (Neighbours Boulevard)/I-10 WB Ramps

Average Delay (sec/veh): 6.9 Worst Case Level Of Service: B[12.7]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	- T	- R	L	- T	- R	L	- T	- R	L	- T	- R

Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Channel			Include			Channel		
Lanes:	0	1	0	0	0	1	0	0	0	0	1	0

Volume Module:												
Base Vol:	2	62	0	0	39	3	0	0	0	37	1	9
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	62	0	0	39	3	0	0	0	37	1	9
Added Vol:	156	0	0	0	0	0	0	0	0	60	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	158	62	0	0	39	3	0	0	0	97	1	9
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	158	62	0	0	39	3	0	0	0	97	1	9
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	158	62	0	0	39	3	0	0	0	97	1	9

Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	4.0	3.3

Capacity Module:												
Cnflct Vol:	39	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	418	417	62
Potent Cap.:	1584	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	595	530	1009
Move Cap.:	1584	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	545	472	1009
Volume/Cap:	0.10	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.18	0.00	0.01

Level Of Service Module:												
Queue:	0.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	0.0
Stopped Del:	7.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	8.6
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	A
Movement:	LT - LTR - RT											
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	544	xxxx	xxxxx
SharedQueue:	0.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.7	xxxx	xxxxx
Shrd StpDel:	7.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	13.1	xxxx	xxxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	B	*	*
ApproachDel:	xxxxxxx	12.7	xxxxxxx	xxxxxxx								
ApproachLOS:	*	*	*	*	*	*	*	*	*	B	*	*

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term PM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #2 SR-78 (Neighbours Boulevard)/I-10 EB Ramps

Average Delay (sec/veh): 2.6 Worst Case Level Of Service: A[9.9]

Approach:	North Bound			South Bound			East Bound			West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R

Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign										
Rights:	Channel			Include			Channel			Include										
Lanes:	0	0	1	0	1	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0

Volume Module:

Base Vol:	0	28	39	8	68	0	36	2	11	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	28	39	8	68	0	36	2	11	0	0	0
Added Vol:	0	156	94	0	60	0	0	0	103	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	184	133	8	128	0	36	2	114	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	184	133	8	128	0	36	2	114	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	184	133	8	128	0	36	2	114	0	0	0

Critical Gap Module:

Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	6.4	6.5	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx

Capacity Module:

Cnflct Vol:	xxxx	xxxx	xxxxx	184	xxxx	xxxxx	395	328	128	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	1403	xxxx	xxxxx	614	594	927	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	1403	xxxx	xxxxx	611	591	927	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.01	xxxx	xxxx	0.06	0.00	0.12	xxxx	xxxx	xxxx

Level Of Service Module:

Queue:	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	0.4	xxxxx	xxxx	xxxxx			
Stopped Del:	xxxxx	xxxx	xxxxx	7.6	xxxx	xxxxx	xxxxx	xxxx	9.4	xxxxx	xxxx	xxxxx			
LOS by Move:	*	*	*	A	*	*	*	*	A	*	*	*			
Movement:	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	610	xxxx	xxxxx	xxxx	xxxx	xxxxx			
SharedQueue:	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	0.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx			
Shrd StpDel:	xxxxx	xxxx	xxxxx	7.6	xxxx	xxxxx	11.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx			
Shared LOS:	*	*	*	A	*	*	B	*	*	*	*	*			
ApproachDel:	xxxxxxx			xxxxxxx			9.9			xxxxxxx					
ApproachLOS:	*			*			A			*					

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term PM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #3 SR-78/22nd Ave

Average Delay (sec/veh): 0.2 Worst Case Level Of Service: B[13.0]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	- T	- R	L	- T	- R	L	- T	- R	L	- T	- R

Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0	1	0	0	0	0	0	0	1	0	0	0

Volume Module:

Base Vol:	2	56	0	0	65	2	1	0	1	3	1	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	56	0	0	65	2	1	0	1	3	1	0
Added Vol:	0	250	0	0	163	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	2	306	0	0	228	2	1	0	1	3	1	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	2	306	0	0	228	2	1	0	1	3	1	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	2	306	0	0	228	2	1	0	1	3	1	0

Critical Gap Module:

Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.1	xxxx	6.2	7.1	6.5	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3	3.5	4.0	xxxxx

Capacity Module:

Cnflct Vol:	230	xxxx	xxxxx	xxxx	xxxx	xxxxx	539	xxxx	229	539	540	xxxxx
Potent Cap.:	1350	xxxx	xxxxx	xxxx	xxxx	xxxxx	456	xxxx	815	456	451	xxxxx
Move Cap.:	1350	xxxx	xxxxx	xxxx	xxxx	xxxxx	455	xxxx	815	455	451	xxxxx
Volume/Cap:	0.00	xxxx	xxxx	xxxx	xxxx	xxxx	0.00	xxxx	0.00	0.01	0.00	xxxx

Level Of Service Module:

Queue:	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	7.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT				
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	584	xxxxx	454	xxxx	xxxxx
SharedQueue:	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.0	xxxxx	0.0	xxxx	xxxxx
Shrd StpDel:	7.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	11.2	xxxxx	13.0	xxxx	xxxxx
Shared LOS:	A	*	*	*	*	*	*	B	*	B	*	*
ApproachDel:	xxxxxxx			xxxxxxx			11.2			13.0		
ApproachLOS:	*			*			B			B		

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term PM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #4 Neighbours (SR-78)/28th Ave

Cycle (sec): 100 Critical Vol./Cap. (X): 0.717
 Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 14.7
 Optimal Cycle: 0 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1	0	0	1	0	1	0	0	0	1

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Volume Module:

Base Vol:	0	24	10	2	21	22	22	4	0	9	3	8
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	24	10	2	21	22	22	4	0	9	3	8
Added Vol:	0	0	0	0	0	163	250	244	0	0	163	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	24	10	2	21	185	272	248	0	9	166	8
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	24	10	2	21	185	272	248	0	9	166	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	24	10	2	21	185	272	248	0	9	166	8
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	24	10	2	21	185	272	248	0	9	166	8

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Saturation Flow Module:

Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.71	0.29	0.01	0.10	0.89	0.52	0.48	0.00	0.05	0.91	0.04
Final Sat.:	0	382	159	6	65	575	380	346	0	33	600	29

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Capacity Analysis Module:

Vol/Sat:	xxxx	0.06	0.06	0.32	0.32	0.32	0.72	0.72	xxxx	0.28	0.28	0.28
Crit Moves:	****					****	****			****		
Delay/Veh:	0.0	9.1	9.1	10.2	10.2	10.2	18.6	18.6	0.0	10.0	10.0	10.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	9.1	9.1	10.2	10.2	10.2	18.6	18.6	0.0	10.0	10.0	10.0
LOS by Move:	*	A	A	B	B	B	C	C	*	A	A	A
ApproachDel:		9.1			10.2			18.6			10.0	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		9.1			10.2			18.6			10.0	
LOS by Appr:		A			B			C			A	

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term PM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #5 Ramells (SR-78)/28th Ave

Cycle (sec): 100 Critical Vol./Cap. (X): 0.640
 Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 13.8
 Optimal Cycle: 0 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1	0	1	0	1	0	0	1	0	0

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Volume Module:

Base Vol:	0	9	18	1	17	0	2	0	0	23	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	9	18	1	17	0	2	0	0	23	0	0
Added Vol:	0	0	494	0	0	0	0	0	0	326	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	9	512	1	17	0	2	0	0	349	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	9	512	1	17	0	2	0	0	349	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	9	512	1	17	0	2	0	0	349	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	9	512	1	17	0	2	0	0	349	0	0

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Saturation Flow Module:

Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.02	0.98	0.06	0.94	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Final Sat.:	0	14	800	34	572	0	556	0	0	650	0	0

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Capacity Analysis Module:

Vol/Sat:	xxxx	0.64	0.64	0.03	0.03	xxxx	0.00	xxxx	xxxx	0.54	xxxx	xxxx
Crit Moves:			****		****		****			****		
Delay/Veh:	0.0	14.0	14.0	8.6	8.6	0.0	8.8	0.0	0.0	13.7	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	14.0	14.0	8.6	8.6	0.0	8.8	0.0	0.0	13.7	0.0	0.0
LOS by Move:	*	B	B	A	A	*	A	*	*	B	*	*
ApproachDel:		14.0			8.6			8.8			13.7	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		14.0			8.6			8.8			13.7	
LOS by Appr:		B			A			A			B	

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term PM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #6 SR-78/30th Avenue

Average Delay (sec/veh): 5.5 Worst Case Level Of Service: C[19.7]

Approach:	North Bound			South Bound			East Bound			West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R

Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0	0	1	0	0	0	1	0	0	0	0	0

Volume Module:

Base Vol:	0	29	0	0	46	0	0	0	0	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	29	0	0	46	0	0	0	0	0	0	0
Added Vol:	0	244	0	0	163	163	250	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	273	0	0	209	163	250	0	0	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	273	0	0	209	163	250	0	0	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	273	0	0	209	163	250	0	0	0	0	0

Critical Gap Module:

Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx

Capacity Module:

Cnflct Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	564	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	491	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	491	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.51	xxxx	xxxx	xxxx	xxxx	xxxx

Level Of Service Module:

Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	19.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	C	*	*	*	*	*
Movement:	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxxx			xxxxxxx			19.7			xxxxxxx		
ApproachLOS:	*			*			C			*		

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term PM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #7 SR-78/34th Avenue

Average Delay (sec/veh): 6.2 Worst Case Level Of Service: B[11.8]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R

Control:	Uncontrolled			Uncontrolled			Yield Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0	1	0	0	0	0	0	0	1!	0	0	1!

Volume Module:												
Base Vol:	0	39	0	0	44	0	0	0	0	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	39	0	0	44	0	0	0	0	0	0	0
Added Vol:	17	0	0	0	0	163	244	0	26	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	17	39	0	0	44	163	244	0	26	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	17	39	0	0	44	163	244	0	26	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	17	39	0	0	44	163	244	0	26	0	0	0

Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3	xxxxx	xxxx	xxxxx

Capacity Module:												
Cnflict Vol:	207	xxxx	xxxxx	xxxx	xxxx	xxxxx	199	xxxx	126	xxxx	xxxx	xxxxx
Potent Cap.:	1376	xxxx	xxxxx	xxxx	xxxx	xxxxx	795	xxxx	930	xxxx	xxxx	xxxxx
Move Cap.:	1376	xxxx	xxxxx	xxxx	xxxx	xxxxx	787	xxxx	930	xxxx	xxxx	xxxxx
Volume/Cap:	0.01	xxxx	xxxx	xxxx	xxxx	xxxx	0.31	xxxx	0.03	xxxx	xxxx	xxxx

Level Of Service Module:												
Queue:	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	799	xxxxx	xxxx	0	xxxxx
SharedQueue:	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	1.5	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	11.8	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	A	*	*	*	*	*	*	B	*	*	*	*
ApproachDel:	xxxxxxx			xxxxxxx			11.8			xxxxxxx		
ApproachLOS:		*			*			B			*	

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term PM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #8 Lovekin/I-10 WB ramps

Cycle (sec): 100 Critical Vol./Cap. (X): 0.249
 Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 9.0
 Optimal Cycle: 19 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	2	0	0	1	0	0	0	0	1	0

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Volume Module:

Base Vol:	23	300	0	0	270	45	0	0	0	51	13	81
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	23	300	0	0	270	45	0	0	0	51	13	81
Added Vol:	154	26	0	0	9	9	0	0	0	51	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	177	326	0	0	279	54	0	0	0	102	13	81
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	177	326	0	0	279	54	0	0	0	102	13	81
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	177	326	0	0	279	54	0	0	0	102	13	81
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	177	326	0	0	279	54	0	0	0	102	13	81

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Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.52	0.95	1.00	1.00	0.98	0.98	1.00	1.00	1.00	0.85	0.85	0.85
Lanes:	1.00	2.00	0.00	0.00	1.68	0.32	0.00	0.00	0.00	0.89	0.11	1.00
Final Sat.:	996	3610	0	0	3107	601	0	0	0	1432	183	1615

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Capacity Analysis Module:

Vol/Sat:	0.18	0.09	0.00	0.00	0.09	0.09	0.00	0.00	0.00	0.07	0.07	0.05
Crit Moves:	****									****		
Green/Cycle:	0.71	0.71	0.00	0.00	0.71	0.71	0.00	0.00	0.00	0.29	0.29	0.29
Volume/Cap:	0.25	0.13	0.00	0.00	0.13	0.13	0.00	0.00	0.00	0.25	0.25	0.18
Delay/Veh:	5.2	4.5	0.0	0.0	4.5	4.5	0.0	0.0	0.0	27.7	27.7	27.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	5.2	4.5	0.0	0.0	4.5	4.5	0.0	0.0	0.0	27.7	27.7	27.0
AustraQueue:	2	3	0	0	2	0	0	0	0	2	0	2

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term PM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 Lovekin/I-10 EB ramps

Cycle (sec): 100 Critical Vol./Cap. (X): 0.266
 Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 11.5
 Optimal Cycle: 20 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1	1	0	2	0	1	0	1	0	0

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Volume Module:

Base Vol:	0	215	59	131	192	0	111	30	55	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	215	59	131	192	0	111	30	55	0	0	0
Added Vol:	0	167	77	0	60	0	13	0	103	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	382	136	131	252	0	124	30	158	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	382	136	131	252	0	124	30	158	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	382	136	131	252	0	124	30	158	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	382	136	131	252	0	124	30	158	0	0	0

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Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.96	0.96	0.41	0.95	1.00	0.85	0.85	0.85	1.00	1.00	1.00
Lanes:	0.00	1.47	0.53	1.00	2.00	0.00	0.81	0.19	1.00	0.00	0.00	0.00
Final Sat.:	0	2693	959	777	3610	0	1306	316	1622	0	0	0

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Capacity Analysis Module:

Vol/Sat:	0.00	0.14	0.14	0.17	0.07	0.00	0.09	0.09	0.10	0.00	0.00	0.00
Crit Moves:				****					****			
Green/Cycle:	0.00	0.63	0.63	0.63	0.63	0.00	0.37	0.37	0.37	0.00	0.00	0.00
Volume/Cap:	0.00	0.22	0.22	0.27	0.11	0.00	0.26	0.26	0.27	0.00	0.00	0.00
Delay/Veh:	0.0	7.9	7.9	8.4	7.2	0.0	22.3	22.3	22.4	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	7.9	7.9	8.4	7.2	0.0	22.3	22.3	22.4	0.0	0.0	0.0
AustraQueue:	0	5	2	2	3	0	2	1	3	0	0	0

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term PM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #10 Lovekin/14th

Cycle (sec): 100 Critical Vol./Cap. (X): 0.449
 Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 10.8
 Optimal Cycle: 0 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0	0	1	0	1	0	1	0	1	0

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Volume Module:

Base Vol:	8	52	19	67	55	18	15	14	1	9	16	73
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	8	52	19	67	55	18	15	14	1	9	16	73
Added Vol:	0	244	0	0	163	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	8	296	19	67	218	18	15	14	1	9	16	73
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	8	296	19	67	218	18	15	14	1	9	16	73
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	296	19	67	218	18	15	14	1	9	16	73
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	8	296	19	67	218	18	15	14	1	9	16	73

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Saturation Flow Module:

Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.03	0.97	1.00	1.00	1.00	1.00	0.52	0.48	1.00	1.00	1.00	1.00
Final Sat.:	18	659	774	574	629	709	267	249	596	491	528	589

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Capacity Analysis Module:

Vol/Sat:	0.45	0.45	0.02	0.12	0.35	0.03	0.06	0.06	0.00	0.02	0.03	0.12
Crit Moves:	****			****			****			****		
Delay/Veh:	11.9	11.9	7.3	9.6	11.1	7.7	9.5	9.5	8.2	9.6	9.2	9.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	11.9	11.9	7.3	9.6	11.1	7.7	9.5	9.5	8.2	9.6	9.2	9.0
LOS by Move:	B	B	A	A	B	A	A	A	A	A	A	A
ApproachDel:	11.6			10.6			9.4			9.1		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	11.6			10.6			9.4			9.1		
LOS by Appr:	B			B			A			A		

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term PM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #11 Lovekin/16th-Seeley

Cycle (sec): 100 Critical Vol./Cap. (X): 0.364
 Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 9.2
 Optimal Cycle: 0 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0	0	1	0	0	0	1	0	0	1

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Volume Module:

Base Vol:	2	28	4	9	32	3	5	9	5	3	6	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	28	4	9	32	3	5	9	5	3	6	10
Added Vol:	0	244	0	0	163	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	2	272	4	9	195	3	5	9	5	3	6	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	2	272	4	9	195	3	5	9	5	3	6	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	2	272	4	9	195	3	5	9	5	3	6	10
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	2	272	4	9	195	3	5	9	5	3	6	10

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Saturation Flow Module:

Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.01	0.99	1.00	0.09	1.88	0.03	0.26	0.48	0.26	0.16	0.31	0.53
Final Sat.:	5	746	879	64	1400	22	178	320	178	110	221	368

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Capacity Analysis Module:

Vol/Sat:	0.36	0.36	0.00	0.14	0.14	0.14	0.03	0.03	0.03	0.03	0.03	0.03
Crit Moves:	****			****			****			****		
Delay/Veh:	10.1	10.1	6.8	8.3	8.3	8.2	8.0	8.0	8.0	7.8	7.8	7.8
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	10.1	10.1	6.8	8.3	8.3	8.2	8.0	8.0	8.0	7.8	7.8	7.8
LOS by Move:	B	B	A	A	A	A	A	A	A	A	A	A
ApproachDel:	10.1			8.3			8.0			7.8		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	10.1			8.3			8.0			7.8		
LOS by Appr:	B			A			A			A		

Rio Mesa Solar Electric Generating Facility (SEGF)
Near Term AM Peak Hour Conditions - with Peak Project Construction
With Second Shift Analysis

Scenario Report

Scenario: NTAMWP Rev

Command: NTAMWP
Volume: NTAM
Geometry: EXISTING
Impact Fee: Default Impact Fee
Trip Generation: Construction AM
Trip Distribution: Trip Distribution
Paths: Default Paths
Routes: Default Routes
Configuration: Default Configuration

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term AM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Trip Generation Report

Forecast for AM Construction

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	Operations	1.00	Operation	0.00	0.00	0	0	0	0.0
2	Construction	1.00	Construction	35.00	0.00	35	0	35	66.0
	Zone 2 Subtotal					35	0	35	66.0
3	Construction	1.00	Materials Truc	6.00	3.00	6	3	9	17.0
	Zone 3 Subtotal					6	3	9	17.0
4	Construction	1.00	Equipment Truc	6.00	3.00	6	3	9	17.0
	Zone 4 Subtotal					6	3	9	17.0
TOTAL						47	6	53	100.0

 Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term AM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Impact Analysis Report
 Level Of Service

Intersection	LOS	Base		LOS	Future		Change in
		Del/ Veh	V/ C		Del/ Veh	V/ C	
# 1 SR-78 (Neighbours Boulevard)/I	A	9.0	0.000	A	9.1	0.000	+ 0.122 D/V
# 2 SR-78 (Neighbours Boulevard)/I	A	8.9	0.000	A	8.9	0.000	-0.032 D/V
# 3 SR-78/22nd Ave	A	9.3	0.000	A	9.5	0.000	+ 0.224 D/V
# 4 Neighbours (SR-78)/28th Ave	A	7.0	0.030	A	7.0	0.059	+ 0.029 V/C
# 5 Ramells (SR-78)/28th Ave	A	7.0	0.027	A	7.3	0.079	+ 0.053 V/C
# 6 SR-78/30th Avenue	A	0.0	0.000	A	9.0	0.000	+ 9.045 D/V
# 7 SR-78/34th Avenue	A	0.0	0.000	A	7.3	0.000	+ 7.295 D/V
# 8 Lovekin/I-10 WB ramps	B	10.6	0.135	B	10.6	0.135	+ 0.041 D/V
# 9 Lovekin/I-10 EB ramps	A	8.3	0.116	A	8.3	0.109	-0.043 D/V
# 10 Lovekin/14th	A	8.1	0.121	A	8.1	0.121	+ 0.000 V/C
# 11 Lovekin/16th-Seeley	A	7.4	0.056	A	7.5	0.056	+ 0.000 V/C

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term AM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #1 SR-78 (Neighbours Boulevard)/I-10 WB Ramps

Average Delay (sec/veh): 3.5 Worst Case Level Of Service: A[9.1]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R

Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign												
Rights:	Include			Channel			Include			Channel												
Lanes:	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1

Volume Module:

Base Vol:	11	31	0	0	25	30	0	0	0	22	1	6
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	11	31	0	0	25	30	0	0	0	22	1	6
Added Vol:	2	0	0	0	0	0	0	0	0	15	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	13	31	0	0	25	30	0	0	0	37	1	6
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	13	31	0	0	25	30	0	0	0	37	1	6
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	13	31	0	0	25	30	0	0	0	37	1	6

Critical Gap Module:

Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	4.0	3.3

Capacity Module:

Cnflct Vol:	25	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	97	82	31
Potent Cap.:	1603	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	907	812	1049
Move Cap.:	1603	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	901	805	1049
Volume/Cap:	0.01	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.04	0.00	0.01

Level Of Service Module:

Queue:	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	0.0
Stopped Del:	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	8.5
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	A
Movement:	LT - LTR - RT											
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	899	xxxx	xxxxx
SharedQueue:	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.1	xxxx	xxxxx
Shrd StpDel:	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	9.2	xxxx	xxxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	A	*	*
ApproachDel:	xxxxxxx			xxxxxxx			xxxxxxx			9.1		
ApproachLOS:	*			*			*			A		

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term AM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #2 SR-78 (Neighbours Boulevard)/I-10 EB Ramps

Average Delay (sec/veh): 2.4 Worst Case Level Of Service: A[8.9]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R

Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign						
Rights:	Channel			Include			Channel			Include						
Lanes:	0	0	1	0	1	0	0	1	0	0	1	0	0	0	0	0

Volume Module:

Base Vol:	0	21	40	18	53	0	10	1	10	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	21	40	18	53	0	10	1	10	0	0	0
Added Vol:	0	2	4	0	15	0	0	0	14	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	23	44	18	68	0	10	1	24	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	23	44	18	68	0	10	1	24	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	23	44	18	68	0	10	1	24	0	0	0

Critical Gap Module:

Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	6.4	6.5	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx

Capacity Module:

Cnflict Vol:	xxxx	xxxx	xxxxx	23	xxxx	xxxxx	149	127	68	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	1605	xxxx	xxxxx	848	767	1001	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	1605	xxxx	xxxxx	840	759	1001	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.01	xxxx	xxxx	0.01	0.00	0.02	xxxx	xxxx	xxxx

Level Of Service Module:

Queue:	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	0.1	xxxxx	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	7.3	xxxx	xxxxx	xxxxx	xxxx	8.7	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	A	*	*	*	*	A	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	832	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	7.3	xxxx	xxxxx	9.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	A	*	*	A	*	*	*	*	*
ApproachDel:	xxxxxxx			xxxxxxx			8.9			xxxxxxx		
ApproachLOS:	*			*			A			*		

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term AM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #3 SR-78/22nd Ave

Average Delay (sec/veh): 0.6 Worst Case Level Of Service: A[9.5]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R

Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0	0	1! 0 0	0	0	1! 0 0	0	0	1! 0 0	0	1	0 0 0

Volume Module:

Base Vol:	1	64	4	1	46	1	1	2	1	3	1	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1	64	4	1	46	1	1	2	1	3	1	0
Added Vol:	0	6	0	0	29	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1	70	4	1	75	1	1	2	1	3	1	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	1	70	4	1	75	1	1	2	1	3	1	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	1	70	4	1	75	1	1	2	1	3	1	0

Critical Gap Module:

Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	xxxxx

Capacity Module:

Cnflct Vol:	76	xxxx	xxxxx	74	xxxx	xxxxx	152	154	76	153	152	xxxxx
Potent Cap.:	1536	xxxx	xxxxx	1538	xxxx	xxxxx	820	742	991	819	743	xxxxx
Move Cap.:	1536	xxxx	xxxxx	1538	xxxx	xxxxx	818	741	991	815	742	xxxxx
Volume/Cap:	0.00	xxxx	xxxx	0.00	xxxx	xxxx	0.00	0.00	0.00	0.00	0.00	xxxx

Level Of Service Module:

Queue:	0.0	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	7.3	xxxx	xxxxx	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT											
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	811	xxxxx	796	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.0	xxxxx	0.0	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	9.5	xxxxx	9.5	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	A	*	A	*	*
ApproachDel:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	9.5	xxxxxx	9.5	xxxxxx	xxxxxx	
ApproachLOS:	*	*	*	*	*	*	A	*	A	*	*	

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term AM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #4 Neighbours (SR-78)/28th Ave

Cycle (sec): 100 Critical Vol./Cap. (X): 0.059
 Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 7.0
 Optimal Cycle: 0 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1	0	0	1	0	0	1	0	0	1

Volume Module:

Base Vol:	0	19	6	3	9	17	15	0	1	4	10	6
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	19	6	3	9	17	15	0	1	4	10	6
Added Vol:	0	0	0	0	0	29	6	0	0	0	17	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	19	6	3	9	46	21	0	1	4	27	6
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	19	6	3	9	46	21	0	1	4	27	6
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	19	6	3	9	46	21	0	1	4	27	6
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	19	6	3	9	46	21	0	1	4	27	6

Saturation Flow Module:

Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.76	0.24	0.05	0.16	0.79	0.95	0.00	0.05	0.11	0.73	0.16
Final Sat.:	0	685	216	51	153	784	793	0	38	95	644	143

Capacity Analysis Module:

Vol/Sat:	xxxx	0.03	0.03	0.06	0.06	0.06	0.03	xxxx	0.03	0.04	0.04	0.04
Crit Moves:		****		****		****		****		****		****
Delay/Veh:	0.0	7.0	7.0	6.8	6.8	6.8	7.4	0.0	7.4	7.2	7.2	7.2
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	7.0	7.0	6.8	6.8	6.8	7.4	0.0	7.4	7.2	7.2	7.2
LOS by Move:	*	A	A	A	A	A	A	*	A	A	A	A
ApproachDel:		7.0		6.8		6.8		7.4		7.2		7.2
Delay Adj:		1.00		1.00		1.00		1.00		1.00		1.00
ApprAdjDel:		7.0		6.8		6.8		7.4		7.2		7.2
LOS by Appr:		A		A		A		A		A		A

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term AM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #5 Ramells (SR-78)/28th Ave

Cycle (sec): 100 Critical Vol./Cap. (X): 0.079
 Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 7.3
 Optimal Cycle: 0 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1	0	1	0	0	1	0	0	1	0

Volume Module:

Base Vol:	0	15	8	1	11	0	0	0	0	21	1	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	15	8	1	11	0	0	0	0	21	1	1
Added Vol:	0	0	6	0	0	0	0	0	0	45	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	15	14	1	11	0	0	0	0	66	1	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	15	14	1	11	0	0	0	0	66	1	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	15	14	1	11	0	0	0	0	66	1	1
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	15	14	1	11	0	0	0	0	66	1	1

Saturation Flow Module:

Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.52	0.48	0.08	0.92	0.00	0.00	1.00	0.00	0.98	0.01	0.01
Final Sat.:	0	486	453	72	793	0	0	0	0	831	13	13

Capacity Analysis Module:

Vol/Sat:	xxxx	0.03	0.03	0.01	0.01	xxxx	xxxx	xxxx	xxxx	0.08	0.08	0.08
Crit Moves:	****			****								****
Delay/Veh:	0.0	6.9	6.9	7.1	7.1	0.0	0.0	0.0	0.0	7.5	7.5	7.5
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	6.9	6.9	7.1	7.1	0.0	0.0	0.0	0.0	7.5	7.5	7.5
LOS by Move:	*	A	A	A	A	*	*	*	*	A	A	A
ApproachDel:		6.9			7.1		xxxxxx				7.5	
Delay Adj:		1.00			1.00		xxxxxx				1.00	
ApprAdjDel:		6.9			7.1		xxxxxx				7.5	
LOS by Appr:		A			A		*				A	

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term AM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #6 SR-78/30th Avenue

Average Delay (sec/veh): 0.4 Worst Case Level Of Service: A[9.0]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R

Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0	0	1	0	0	0	1	0	0	0	0	0

Volume Module:

Base Vol:	0	38	0	0	37	0	0	0	0	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	38	0	0	37	0	0	0	0	0	0	0
Added Vol:	0	0	0	0	17	29	6	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	38	0	0	54	29	6	0	0	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	38	0	0	54	29	6	0	0	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	38	0	0	54	29	6	0	0	0	0	0

Critical Gap Module:

Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx

Capacity Module:

Cnflct Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	107	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	896	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	896	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.01	xxxx	xxxx	xxxx	xxxx	xxxx

Level Of Service Module:

Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	9.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			9.0			xxxxxx		
ApproachLOS:	*			*			A			*		

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term AM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #7 SR-78/34th Avenue

Average Delay (sec/veh): 0.2 Worst Case Level Of Service: A[7.3]

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R

Control:	Uncontrolled	Uncontrolled	Yield Sign	Stop Sign
Rights:	Include	Include	Include	Include
Lanes:	0 1 0 0 0	0 0 0 1 0	0 0 1! 0 0	0 0 1! 0 0

Volume Module:

Base Vol:	0	42	0	0	30	2	0	0	0	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	42	0	0	30	2	0	0	0	0	0	0
Added Vol:	2	0	0	0	0	17	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	2	42	0	0	30	19	0	0	0	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	2	42	0	0	30	19	0	0	0	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	2	42	0	0	30	19	0	0	0	0	0	0

Critical Gap Module:

Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx

Capacity Module:

Cnflct Vol:	49	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	1571	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	1571	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	0.00	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx

Level Of Service Module:

Queue:	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT											
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	0	xxxxx	xxxx	0	xxxxx
SharedQueue:	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxxx			xxxxxxx			xxxxxxx			xxxxxxx		
ApproachLOS:	*			*			*			*		

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term AM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #8 Lovekin/I-10 WB ramps

Cycle (sec): 100 Critical Vol./Cap. (X): 0.135
 Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 10.6
 Optimal Cycle: 17 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	2	0	0	1	0	0	0	0	1	0

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Volume Module:

Base Vol:	31	189	0	0	203	96	0	0	0	49	11	84
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	31	189	0	0	203	96	0	0	0	49	11	84
Added Vol:	0	0	0	0	1	1	0	0	0	5	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	31	189	0	0	204	97	0	0	0	54	11	84
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	31	189	0	0	204	97	0	0	0	54	11	84
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	31	189	0	0	204	97	0	0	0	54	11	84
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	31	189	0	0	204	97	0	0	0	54	11	84

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Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.53	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	0.85	0.85	0.85
Lanes:	1.00	2.00	0.00	0.00	1.36	0.64	0.00	0.00	0.00	0.83	0.17	1.00
Final Sat.:	1005	3610	0	0	2452	1166	0	0	0	1342	273	1615

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Capacity Analysis Module:

Vol/Sat:	0.03	0.05	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.04	0.04	0.05
Crit Moves:					****							****
Green/Cycle:	0.62	0.62	0.00	0.00	0.62	0.62	0.00	0.00	0.00	0.38	0.38	0.38
Volume/Cap:	0.05	0.09	0.00	0.00	0.14	0.14	0.00	0.00	0.00	0.10	0.10	0.14
Delay/Veh:	7.7	7.8	0.0	0.0	8.1	8.1	0.0	0.0	0.0	19.8	19.8	20.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	7.7	7.8	0.0	0.0	8.1	8.1	0.0	0.0	0.0	19.8	19.8	20.1
AustraQueue:	0	2	0	0	2	1	0	0	0	1	0	2

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term AM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 Lovekin/I-10 EB ramps

Cycle (sec): 100 Critical Vol./Cap. (X): 0.109
 Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 8.3
 Optimal Cycle: 16 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound											
Movement:	L	T	R	L	T	R	L	T	R	L	T	R									
Control:	Permitted			Permitted			Permitted			Permitted											
Rights:	Include			Include			Include			Include											
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0									
Lanes:	0	0	1	1	0	0	1	0	2	0	0	0	1	0	1	0	0	0	0	0	0

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Volume Module:

Base Vol:	0	162	36	94	162	0	60	13	24	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	162	36	94	162	0	60	13	24	0	0	0
Added Vol:	0	0	0	0	6	0	0	0	11	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	162	36	94	168	0	60	13	35	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	162	36	94	168	0	60	13	35	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	162	36	94	168	0	60	13	35	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	162	36	94	168	0	60	13	35	0	0	0

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Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.97	0.97	0.61	0.95	1.00	0.90	0.90	0.90	1.00	1.00	1.00
Lanes:	0.00	1.64	0.36	1.00	2.00	0.00	1.00	0.27	0.73	0.00	0.00	0.00
Final Sat.:	0	3025	672	1153	3610	0	1718	465	1253	0	0	0

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Capacity Analysis Module:

Vol/Sat:	0.00	0.05	0.05	0.08	0.05	0.00	0.03	0.03	0.03	0.00	0.00	0.00
Crit Moves:				****			****					
Green/Cycle:	0.00	0.74	0.74	0.74	0.74	0.00	0.26	0.26	0.26	0.00	0.00	0.00
Volume/Cap:	0.00	0.07	0.07	0.11	0.06	0.00	0.14	0.11	0.11	0.00	0.00	0.00
Delay/Veh:	0.0	3.5	3.5	3.6	3.4	0.0	28.8	28.6	28.6	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	3.5	3.5	3.6	3.4	0.0	28.8	28.6	28.6	0.0	0.0	0.0
AustraQueue:	0	1	0	1	1	0	1	0	1	0	0	0

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term AM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #10 Lovekin/14th

Cycle (sec): 100 Critical Vol./Cap. (X): 0.121
 Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 8.1
 Optimal Cycle: 0 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0	0	1	0	1	0	1	0	1	0

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Volume Module:

Base Vol:	0	44	15	78	45	12	16	16	0	13	8	81
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	44	15	78	45	12	16	16	0	13	8	81
Added Vol:	0	0	0	0	17	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	44	15	78	62	12	16	16	0	13	8	81
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	44	15	78	62	12	16	16	0	13	8	81
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	44	15	78	62	12	16	16	0	13	8	81
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	44	15	78	62	12	16	16	0	13	8	81

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Saturation Flow Module:

Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	1.00	1.00	1.00	1.00	1.00	0.50	0.50	1.00	1.00	1.00	1.00
Final Sat.:	0	702	813	642	705	815	323	323	0	615	673	774

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Capacity Analysis Module:

Vol/Sat:	xxxx	0.06	0.02	0.12	0.09	0.01	0.05	0.05	xxxx	0.02	0.01	0.10
Crit Moves:		****		****				****				****
Delay/Veh:	0.0	8.0	7.0	8.9	8.1	7.0	8.3	8.3	0.0	8.5	7.9	7.6
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	8.0	7.0	8.9	8.1	7.0	8.3	8.3	0.0	8.5	7.9	7.6
LOS by Move:	*	A	A	A	A	A	A	A	*	A	A	A
ApproachDel:		7.7			8.4			8.3			7.8	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		7.7			8.4			8.3			7.8	
LOS by Appr:		A			A			A			A	

Rio Mesa Solar Electric Generating Facility (SEGF)
 Near Term AM Peak Hour Conditions - with Peak Project Construction
 With Second Shift Analysis

Level Of Service Computation Report

2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #11 Lovekin/16th-Seeley

Cycle (sec): 100 Critical Vol./Cap. (X): 0.056
 Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 7.5
 Optimal Cycle: 0 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0	0	1	0	0	0	1	0	0	1

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Volume Module:

Base Vol:	2	41	2	11	36	4	9	12	3	8	6	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	41	2	11	36	4	9	12	3	8	6	10
Added Vol:	0	0	0	0	17	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	2	41	2	11	53	4	9	12	3	8	6	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	2	41	2	11	53	4	9	12	3	8	6	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	2	41	2	11	53	4	9	12	3	8	6	10
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	2	41	2	11	53	4	9	12	3	8	6	10

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Saturation Flow Module:

Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.05	0.95	1.00	0.32	1.56	0.12	0.37	0.50	0.13	0.33	0.25	0.42
Final Sat.:	35	727	901	241	1195	92	315	419	105	292	219	365

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Capacity Analysis Module:

Vol/Sat:	0.06	0.06	0.00	0.05	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03
Crit Moves:	****			****			****			****		
Delay/Veh:	7.6	7.6	6.7	7.7	7.6	7.5	7.3	7.3	7.3	7.1	7.1	7.1
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	7.6	7.6	6.7	7.7	7.6	7.5	7.3	7.3	7.3	7.1	7.1	7.1
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:	7.6			7.6			7.3			7.1		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	7.6			7.6			7.3			7.1		
LOS by Appr:	A			A			A			A		

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

**Applicant's General Comments and Comments to Conditions of Certification
on the Preliminary Staff Assessment**

TRANSMISSION LINE SAFETY & NUISANCE

GENERAL COMMENTS

No general comments.

FINDINGS OF FACT

No findings of fact listed in the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

No proposed Conditions of Certification are included in the PSA.

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

**Applicant's General Comments and Comments to Conditions of Certification
on the Preliminary Staff Assessment**

VISUAL RESOURCES

GENERAL COMMENTS

1. This Section relies upon the Glint and Glare Safety Impact Assessment (Glare Assessment) attached as Appendix TT1 to the Traffic and Transportation of the PSA. However, as discussed at the PSA Workshop, the Glare Assessment does not provide citations or references to support the assertions in that assessment. Staff has agreed to provide supporting citations for this assessment, but the Applicant has not yet received this information. Applicant is still formulating a specific response to address impacts as described within Appendix TT1.
2. This section of the PSA uses the term glare more than 100 times. The glare from the project receivers is variously described as “nuisance glare”, “discomfort glare”, “intense discomfort glare”, “severe glare effects”, “a disruptive source of discomfort glare” or “visual disruption effects”. The glare is alleged to cause visual disruption, discomfort, some level of discomfort, considerable discomfort, substantial discomfort, intense discomfort or making viewers highly uncomfortable. Although these various terms are used interchangeably throughout this section of the PSA, none are defined or explained. Because none of these terms are defined nor distinguished, it is not clear whether all these terms are different ways of describing the same glare effect or whether the different terms are intended to describe varying intensity of glare or discomfort. The Commission internationale de l’Eclairage (CIE) defines discomfort glare in the following manner: “a sensation of annoyance or pain from bright lights in the field of view”. There is no reason to add adjectives that have not been defined further by the organization that is the authority in this technical field. Therefore, Applicant recommends that staff delete the adjectives in favor of simply referring to “discomfort glare” which, by CIE definition, imparts no damage on the eye.
3. The CEC’s Visual Resources Methodology (Appendix *Visual Resources 1* attached) used to conduct the Visual Impact Analysis in the PSA is flawed. The thresholds used to inform the PSA’s findings for degree of impact (in terms of viewer sensitivity) are not based on fact. Therefore, the CEC’s method and PSA’s impact conclusions do not comply with CEQA statute.

The thresholds in the CEC’s methods are arbitrary and the thresholds are so low that following their logic, virtually no development would be allowed at the Project site. For example, the CEC method establishes a “High” degree of impact threshold for any viewer with a view of the project that is longer than 2 minutes. According to this rationale, motorists traveling on I-10, driving 65 miles per hour, who are concentrating on the road, with occasionally obscured views of the Project, would constitute a “High” degree of impact. The CEC’s method also states that if more than 100 residences could see a Project; this would cause a “High” degree of impact. It is unclear how the threshold (100 residences with views) was established, or, for that matter how it constitutes fact. The PSA provides no regulatory guidance, adequate justification, or substantial evidence for how these thresholds were established or why they are valid.

Similar unsupported thresholds throughout the CEC’s method cause the PSA to arrive at likewise unsupported statements of overall impact significance. Please see Appendix *Visual Resources 2*

VISUAL RESOURCES

for the Applicant's detailed assessment of CEC's Visual Resource Methodology and how this method serves to overstate the findings for visual impact.

4. The PSA presumes that viewers share the aesthetic sensibilities of its authors – i.e., that of a natural landscape architect or conservationist. The PSA assumes that viewers will find the form, structure and light of the project to be adverse and degrading. The PSA fails to recognize the possibility that many viewers will find the project to be an interesting, or even an attractive feature. The PSA uses the term “industrial” as a negative descriptor of the RMS project, failing to recognize that the project is a renewable resource that provides a clean energy alternative to traditional sources of generation. As a result, on the basis of this unsupported and subjective assumption, the PSA arbitrarily assumes that viewer concern at all KOPs will be moderate or high. As recognized in the Ivanpah FSA, however:

“the Project will not present conditions visual disorder and disunity that are generally equated with low visual quality or ‘visual blight.’ For example, a mining operation or manufacturing facility might present scenes of strong visual disorder and thus, low visual quality or ‘blight.’ The proposed project, in comparison, would exhibit moderate visual quality and would likely appear more acceptable than many other forms of intensive urban or industrial development. Thus, staff notes that within an urban frame of reference not all viewers would find the project disagreeable or unattractive; indeed, many viewers could find the project interesting to view due to its novelty. Overall, it would exhibit moderate visual quality and preserve scenic (though strongly altered) views. Within an urban frame of reference, this level of impact might be considered acceptable. However, within a landscape conservation-oriented frame of reference, the project would represent a substantial change and impairment of a previously intact natural landscape.”

5. The PSA treatment of number of viewers is inconsistent. Examples include:
 - (1) Occasionally viewer numbers are based on guesses or speculation, rather than hard counts or surveys of users,
 - (2) Inconsistent treatment of viewer numbers, so that even within the PSA the same number is characterized differently,
 - (3) Very low numbers of viewers are characterized as “moderate” or “moderate-to-high”
6. The PSA does not undertake an objective analysis of each KOP, as is typical CEQA practice and as has always been the case in prior Staff Assessments and other EIRs. Instead, the description of various KOPS is “clustered”, so that a group of KOPs is assessed collectively, rather than individually. As a result, the PSA's provided assessment of the KOP's is not precise or accurate when considering the views from each KOP and deprives reviewers the opportunity to understand the project's true visual impact.
7. The viewshed map provided in the PSA as Figure 4 is misleading. The AFC contained separate maps which depicted the viewshed of the heliostat field, and the viewshed of the taller transmission lines and towers. The PSA Figure 4 appears to meld these two maps together in a manner that does not accurately reflect either viewshed. An exaggeration (or “fisheye”) view is created by melding the two maps together. This goes against CEC simulation standards of simulating a viewer's angle (as shown in the Applicant's simulations). In addition, Figure 4 also overlays what is purported to be the area in which “illumination from the solar receivers would be visible”, however, it is inaccurate. The PSA incorrectly assigns “distracting” glare to viewers in areas where the towers are not visible. In addition, the map indicates that some project features may be visible from portions of these locations.

VISUAL RESOURCES

8. The PSA's definition of scenic vista is too broad. Most other agencies in California and many prior Staff Assessments interpret "scenic vista" to be an *officially designated* scenic vista. For example, the Chula Vista PSA finds no substantial effect on a scenic resource because "There are no State-designated scenic roads or vista points in the nearby (2-mile radius) project viewshed." (Chula Vista PSA 5.13-19) The Rio Mesa PSA does not limit the inquiry to whether the project is located "in the scenic view of a local/state/federal-designated scenic vista". Instead, the PSA defines a scenic vista "For the purposes of this analysis...as....a view of high scenic quality perceived through and along a corridor or opening; or from a designated scenic area." The PSA does not explain why the definition of scenic vista is more expansive than the definition of scenic vista for other projects such as Chula Vista. The PSA presumes to create a new, expansive definition for the term "scenic vista", and therefore should cite the authority.
9. The PSA asserts that the Project would completely dominate the Bradshaw Trail's scenic corridor; however, a "corridor" is not a "scenic resource" as scenic resource is defined in the CEQA Guidelines. This definition is not consistent with CEQA and not consistent with how the CEC has defined Scenic Resources in past cases.
10. The PSA asserts that the Bradshaw Trail has high scenic quality due to its designation as a back country byway. A road or trail may be nominated as a back country byway. Pursuant to USC Title 23, Sec. 162 (National scenic byways program) the Secretary may designate a byway to recognize roads having outstanding historic, cultural, natural, recreational, archaeological or scenic qualities. Scenic quality is only one of the factors typically considered relevant to such designation and there is no evidence in the PSA that this factor had any bearing on the byway designation assigned to the Bradshaw Trail. Even if portions of the route may have important scenic values, there is no basis in law or fact to assert that views from the entire route qualify as "a designated scenic vista" simply because the route has been designated a byway. Moreover, the byway designation merely allows a route to be promoted as part of a national byways program and to qualify for federal grants. The designation does not confer any degree of federal protection, other than restrictions on outdoor advertising under particular circumstances.
11. The PSA states, "While not the sole criterion for designation of wilderness areas, preservation of scenic values is a key concern underlying the Wilderness Act (P.L. 88-577(16 U.S.C. 1131-1136))." Preservation of views within a designated Wilderness Area is one of the purposes of the Wilderness Act. To say that development surrounding a Wilderness Area is subject to the developmental restrictions of the Wilderness Act would overstep the regulatory authority of this Act since views outside of the Wilderness Area are not protected (See Appendix *Visual Resources 2* for further discussion). The PSA should be updated to analyze the number of viewers, if any, within portions of the Wilderness Area from which the Project is visible, the scenic quality of these views and the percent of acreage the viewable areas of Palo Verde Mountain Wilderness Area represents within the entire Wilderness Area. The project will not be visible from "nearly the entirety" of this wilderness area, as the PSA asserts. The PSA should accurately describe the portions of the Wilderness Area from which the Project is actually visible, and the PSA should indicate which, if any, of these visible areas are actually used by or accessible to recreational users. In addition, as discussed above, contrary to the PSA's erroneous conclusion, the views from the Wilderness Area are not designated scenic vistas.
12. The characterization of the project vicinity as a "largely undeveloped valley" is incorrect. The Noise section of the PSA more accurately describes the project setting as, "The project vicinity largely comprises agricultural uses with rural residential land use."

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13. CEQA Guidelines Section 15355 requires that the cumulative impacts of the project be Assessed in relation to “closely related” past, present, and reasonably foreseeable future projects. Projects which are outside the viewshed – the natural resource boundary – are not closely related and should not be included in the cumulative impact assessment. Projects which are outside the Project viewshed cannot be seen in combination with the Project and therefore are not relevant to the cumulative impact assessment. Applicant can find no legal authority for the conclusion stated under Regional Cumulative Visual impacts. If such authority exists, please cite.
14. The scale bar in Staff’s Figures is incorrect. The scale bar on Figures 1, 4 and 9 shows 1”=12.5 miles, which is incorrect.

FINDINGS OF FACT

No findings of fact listed.

CONDITIONS OF CERTIFICATION

1. Please revise VIS-1 as follows:

- VIS-1** 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 by blending with the landscape or by providing architectural interest; b) their colors and finishes do not create excessive glare; in particular, that the finish of the solar towers (with the exception of the receiver including calibration areas, and the heliostats) does not cause high reflectivity, resulting in potential glare; and c) their colors and finishes are consistent with local policies and ordinances. Surface color treatment shall include natural finish concrete and/or painting or tinting of stacks, dry cooling structures, tanks, heliostat structures and other features in earth tone colors and values to blend in with the surrounding mountains and desert vegetation. Colors shall be chosen from BLM’s Standard Environmental Colors ~~and pre tested in the field~~. Any transmission line poles and conductors associated with the project shall be non-specular and non-reflective, and the insulators shall be non-reflective and non-refractive. The project owner shall submit for compliance project manager (CPM) review and approval, a specific surface treatment plan that will satisfy these requirements. The treatment plan shall include:
- a. a description of the overall rationale for the proposed surface treatment, including the selection of the proposed color(s) and finishes, ~~including the photographic results of field testing;~~
 - b. a list of each major project structure, building, tank, pipe, wall, and fencing, specifying the color(s) and finish proposed for each. Colors must be identified by vendor, name, finish and number; or according to a universal designation system;
 - c. one set of 11” x 17” color photo simulations at life size scale of the treatment proposed for use on project structures, including structures treated during manufacture, from representative points of view, Key Observation Point 1 (Visual

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Resources Figure 10b of the Staff Assessment) or color-rendered elevation drawings on 18" x 24" minimum sheet size;

- d. color samples on color card or painted steel;
- e. a specific schedule for completion of the treatment; and
- f. a procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final treatment on any buildings or structures treated in the field, until the project owner receives notification of approval of the treatment plan by the CPM. Subsequent modifications to the treatment plan are prohibited without CPM approval.

Verification: At least ~~90~~30 days prior to specifying to the vendor the colors and finishes of the first structures or buildings that are surface treated during manufacture, the project owner shall submit the proposed treatment plan to the CPM for review and approval and simultaneously to Riverside and Imperial Counties for review and comment. If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a plan with the specified revision(s) for review and approval by the CPM before any treatment is applied. Any modifications to the treatment plan must be submitted to the CPM for review and approval.

Prior to the start of commercial operation, the project owner shall notify the CPM that surface treatment of all listed structures and buildings has been completed and is ready for inspection and shall submit one set of electronic color photographs from the same key observation point identified in (c) above.

The project owner shall provide a status report regarding surface treatment maintenance in the Annual Compliance Report. The report shall specify a) the condition of the surfaces of all structures and buildings at the end of the reporting year; b) maintenance activities that occurred during the reporting year; and c) the schedule of maintenance activities for the next year.

2. **VIS-2:** Applicant requests removal of **VIS-2** for the following reasons, as detailed below: a) There is a potential issue with selection of trees that could provide perches for raptors and other migratory birds b) Coordination with Biology and Water Resources Staff has not occurred. c) The cost is unreasonable; and d) The amount of water usage required for all of the potential tree plantings may exceed that associated with a full year of Project operation.
 - a. For the purposes of the analysis, the following trees were considered to meet the requirements set forth in VIS-2: Palo Verde, Desert Willow, and Cottonwood. Any large native tree (such as those meeting the requirements in VIS-2) in the desert will be an attractant to raptors and other birds, particularly if there aren't any others around currently. Most tree species listed below are species that make up the preferred habitats of Elf Owl, Gila Woodpecker, and other birds. Implementing VIS-2 would artificially attract migratory birds to the Project vicinity.
 - b. Visual Resources Staff would need to coordinate with Biology and Water Resources Staff on the specifics of this COC to assure that resolving impacts in one subject area does not inadvertently increase impacts in another subject area.
 - c. A desktop search identified approximately 475 properties within 8.5 miles of either solar tower which could potentially request tree planting. As each property could receive up

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to 8 trees, a total of 3,800 trees could be required to be planted by the Applicant. Costs of these trees vary based on tree type but are estimated to be between \$55 and \$210 per tree. Using an average cost of \$130 per tree, the cost of purchase trees for screening these residences would be approximately \$494,000, exclusive of additional costs to plant trees along the western boundary of Marlowe Park and other necessary costs of installation (labor, machine rentals, etc.).

- d. Water usage will vary based on type of tree planted and location (for example, trees planted to screen residences within the agricultural fields will have a higher water table and require less watering than those outside of these areas). On average, the tree species provided above are suggested to receive an average of 10 gallons per week once established. During the Project's 28 year lifespan (construction and operation), water usage would be 14,560 gallons per week for each tree planted. Assuming an estimate of 3,800 trees planted, water usage would be 170 acre feet, more to a years' worth of operational water use.

For these reasons, please delete VIS-2 in its entirety.

~~Off Site Landscape Screening: Palo Verde Valley Tree Plantings~~

~~VIS-2 The project owner shall plant trees on the western boundary of Marlowe Park, Ripley; and on properties of any residential property owner within 8.5 miles of either solar tower who indicates an interest in having them and ultimately agrees to having them. The intent is to plant the trees in locations that will screen views looking toward the solar power towers from the residences on the property and from the property's primary outdoor living areas.~~

~~The project owner shall meet the following requirements:~~

~~The project owner shall notify managers of Marlowe Park in Ripley, and residents within an 8.5 mile radius of either solar tower of the opportunity to obtain landscape screening as described in this condition. This letter should explain its purpose and state that the property owner/resident has a specific timeframe within which to respond and ultimately agree.~~

~~The project owner shall employ a professional arborist to identify a list of species that are well adapted to the local conditions and which have characteristics that provide effective screening of views. Selected plants shall avoid invasive exotic species as identified by the USDA and Invasive Species Council of California (ISCC).^{1,2}~~

~~The arborist shall work with residents to select up to eight trees from this list of species and will assist the residents in identifying appropriate locations for their installation. The project owner will take responsibility for purchasing and installing the trees, which shall be the equivalent of a 15-gallon standard nursery size.~~

- ~~d) Tree planting is a one-time opportunity for property owners in the Palo Verde Valley. Once installed, irrigation and maintenance of the trees will be the~~

¹ ~~[NRCS Invasive Species Policy, Invasive Species Executive Order 13112](#), Invasive and Noxious Weeds, California State Listed Noxious Weeds.~~

² ~~The California Invasive Species List, Presented on April 21, 2010 by the California Invasive Species Advisory Committee (CISAC) to the Invasive Species Council of California (ISCC).⁴~~

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responsibility of the property owner and the project owner shall have no further responsibility.

Verification: ~~Within 120 days of beginning construction, the project owner shall contact property owners in the Palo Verde Valley within 8.5 miles of either solar tower, including managers of Marlowe Park, Ripley, and the CPM, by registered mail to notify them of the tree-planting program. The project owner shall provide in the Monthly Compliance Report (MCR) a summary of the program, including the following:~~

- ~~a.) parcel numbers of property owners contacted, and map with property owners/residents to be contacted;~~
- ~~b.) actions taken to ensure property owners fully understand the program, including draft of letter(s) to be sent to property owners, for review and approval of the CPM;~~
- ~~c.) list of installations by parcel number;~~
- ~~d.) quantity and species installed on each parcel;~~
- ~~e.) documentation of any property owner who declined to participate by parcel number;~~
- ~~f.) a signed affidavit from project owner or designee; and~~
- ~~g.) copies and records of all communication with managers of Marlowe Park, Ripley.~~

3. Subparagraph (g) of the lighting mitigation plan is redundant and unnecessary. Also minor edits to account for FAA requirements are warranted. Please revise VIS-3 as follows:

VIS-3 To the extent feasible, consistent with safety and security considerations, the project owner shall design and install all permanent exterior 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, with the exception of FAA safety lighting;
- d. illumination of the project and its immediate vicinity is minimized, and
- e. the plan complies with local policies and ordinances.

The project owner shall submit to the CPM for review and approval and simultaneously to Riverside ~~and/or Imperial~~ County as applicable for review and comment a lighting mitigation plan that includes the following:

- a. location and direction of light fixtures shall take the lighting mitigation requirements into account;
- b. lighting design shall consider setbacks of project features from the site boundary to aid in satisfying the lighting mitigation requirements;
- c. lighting shall incorporate fixture hoods/shielding, with light directed downward or toward the area to be illuminated;
- d. light fixtures that are visible from beyond the project boundary shall have cutoff angles that are sufficient to prevent lamps and reflectors from being visible beyond the project boundary, except where necessary for security;

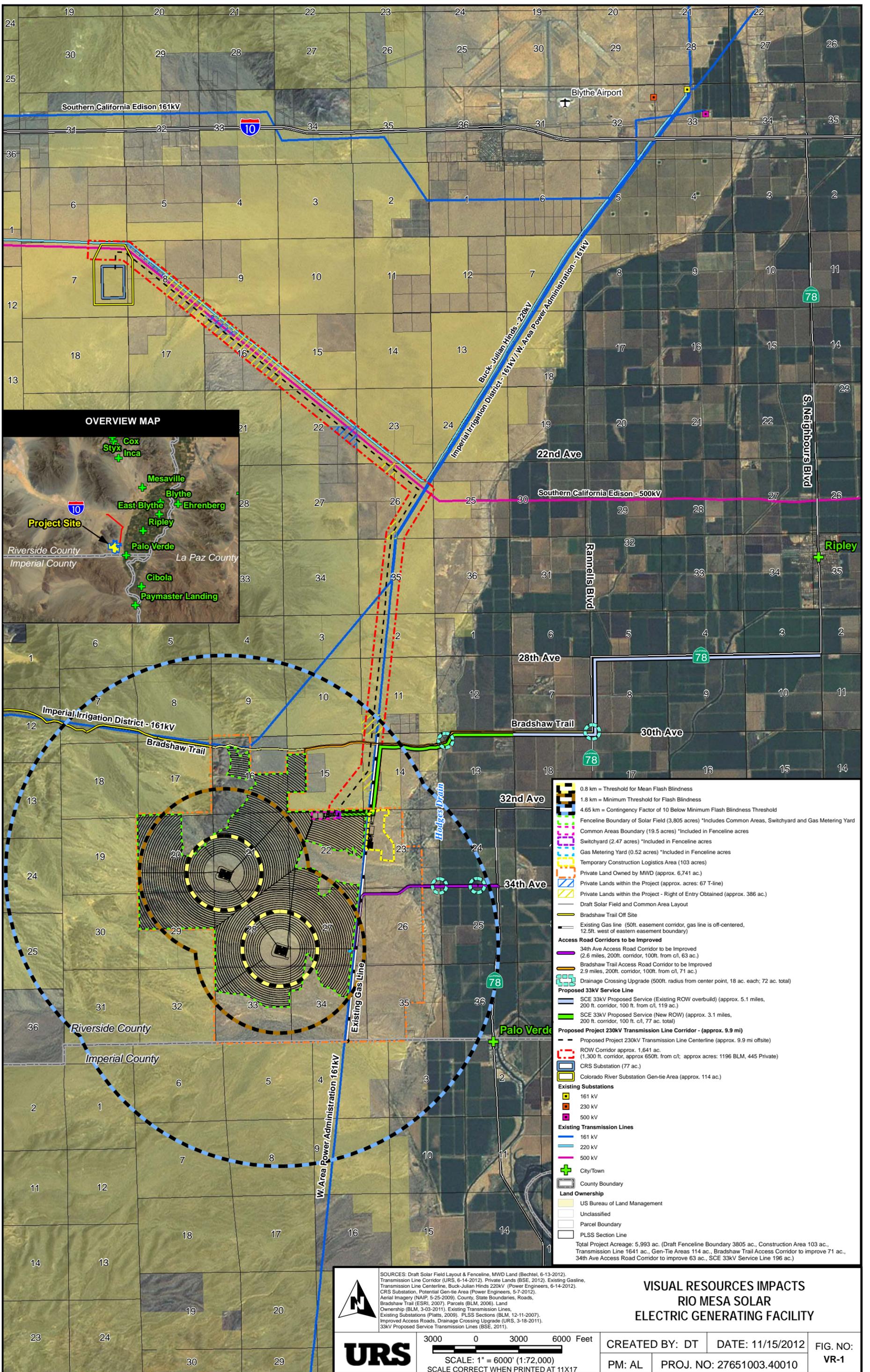
VISUAL RESOURCES

- e. all lighting shall be of minimum necessary brightness consistent with operational safety and security; and
- f. lights in high illumination areas not occupied on a continuous basis (such as maintenance platforms) shall have (in addition to hoods) switches, timer switches, or motion detectors so that the lights operate only when the area is occupied; ~~and~~
- ~~g. statement of conformance with all federal, state and local statutes and regulations related to dark skies or glare, including, but not limited to, the Riverside and Imperial County General Plans and related ordinances.~~

Verification: At least ~~90~~ 60 days prior to ordering any permanent exterior lighting, the project owner shall contact the CPM to discuss the documentation required in the lighting mitigation plan. At least ~~60~~ 30 days prior to ordering any permanent exterior lighting, the project owner shall submit to the CPM for review and approval and simultaneously to Riverside ~~and Imperial~~ County~~s~~ for review and comment a lighting mitigation plan. If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a revised plan for review and approval by the CPM. The submittal shall include 3 printed sets of full-size plans (not to exceed 24" x 36"), 3 sets of 11" x 17" reductions and a digital copy in PDF format. The project owner shall not order any exterior lighting until receiving CPM approval of the lighting mitigation plan.

Prior to commercial operation, the project owner shall notify the CPM that the lighting has been completed and is ready for inspection. If after inspection the CPM notifies the project owner that modifications to the lighting are needed, within 30 days of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed and are ready for inspection.

Within 48 hours of receiving a lighting complaint, the project owner shall provide the CPM with a complaint resolution form report as specified in the Compliance General Conditions including a proposal to resolve the complaint, and a schedule for implementation. The project owner shall notify the CPM within 48 hours after completing implementation of the proposal. A copy of the complaint resolution form report shall be submitted to the CPM within 30 days.



Path: G:\gis\projects\15772765\1002\map_docs\map_docs\map_docs\Flash_Blindness_RMS_Composite_Map_Flash_Blindness_Buffers.mxd, 11/15/2012, 12:39:36 PM

SOURCES: Draft Solar Field Layout & Fenceline, MWD Land (Bechtel, 6-13-2012), Transmission Line Corridor (URS, 6-14-2012), Private Lands (BSE, 2012), Existing Gasline, Transmission Line Centerline, Buck-Julian Hinds 220kV (Power Engineers, 6-14-2012), CRS Substation, Potential Gen-tie Area (Power Engineers, 5-7-2012), Aerial Imagery (NAIP, 5-25-2009), County, State Boundaries, Roads, Bradshaw Trail (ESRI, 2007), Parcels (BLM, 2006), Land Ownership (BLM, 3-03-2011), Existing Transmission Lines, Existing Substations (Platts, 2009), PLSS Sections (BLM, 12-11-2007), Improved Access Roads, Drainage Crossing Upgrade (URS, 3-18-2011), 33kV Proposed Service Transmission Lines (BSE, 2011).

**VISUAL RESOURCES IMPACTS
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY**



3000 0 3000 6000 Feet
SCALE: 1" = 6000' (1:72,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DT	DATE: 11/15/2012	FIG. NO:
PM: AL	PROJ. NO: 27651003.40010	VR-1

- 0.8 km = Threshold for Mean Flash Blindness
 - 1.8 km = Minimum Threshold for Flash Blindness
 - 4.65 km = Contingency Factor of 10 Below Minimum Flash Blindness Threshold
 - Fenceline Boundary of Solar Field (3,805 acres) *Includes Common Areas, Switchyard and Gas Metering Yard
 - Common Areas Boundary (19.5 acres) *Included in Fenceline acres
 - Switchyard (2.47 acres) *Included in Fenceline acres
 - Gas Metering Yard (0.52 acres) *Included in Fenceline acres
 - Temporary Construction Logistics Area (103 acres)
 - Private Land Owned by MWD (approx. 6,741 ac.)
 - Private Lands within the Project (approx. acres: 67 T-line)
 - Private Lands within the Project - Right of Entry Obtained (approx. 386 ac.)
 - Draft Solar Field and Common Area Layout
 - Bradshaw Trail Off Site
 - Existing Gas Line (50ft. easement corridor, gas line is off-centered, 12.5ft. west of eastern easement boundary)
 - Access Road Corridors to be Improved**
 - 34th Ave Access Road Corridor to be Improved (2.6 miles, 200ft. corridor, 100ft. from c/l, 63 ac.)
 - Bradshaw Trail Access Road Corridor to be Improved (2.9 miles, 200ft. corridor, 100ft. from c/l, 71 ac.)
 - Drainage Crossing Upgrade (500ft. radius from center point, 18 ac. each; 72 ac. total)
 - Proposed 33kV Service Line**
 - SCE 33kV Proposed Service (Existing ROW overbuild) (approx. 5.1 miles, 200 ft. corridor, 100 ft. from c/l, 119 ac.)
 - SCE 33kV Proposed Service (New ROW) (approx. 3.1 miles, 200 ft. corridor, 100 ft. c/l, 77 ac. total)
 - Proposed Project 230kV Transmission Line Corridor - (approx. 9.9 mi)**
 - Proposed Project 230kV Transmission Line Centerline (approx. 9.9 mi offsite)
 - ROW Corridor approx. 1,641 ac. (1,300 ft. corridor, approx 650ft. from c/l; approx acres: 1196 BLM, 445 Private)
 - CRS Substation (77 ac.)
 - Colorado River Substation Gen-tie Area (approx. 114 ac.)
 - Existing Substations**
 - 161 kV
 - 230 kV
 - 500 kV
 - Existing Transmission Lines**
 - 161 kV
 - 220 kV
 - 500 kV
 - City/Town
 - County Boundary
 - Land Ownership**
 - US Bureau of Land Management
 - Unclassified
 - Parcel Boundary
 - PLSS Section Line
- Total Project Acreage: 5,993 ac. (Draft Fenceline Boundary 3805 ac., Construction Area 103 ac., Transmission Line 1641 ac., Gen-Tie Areas 114 ac., Bradshaw Trail Access Corridor to improve 71 ac., 34th Ave Access Road Corridor to improve 63 ac., SCE 33kV Service Line 196 ac.)

Appendix Visual Resources 1

APPENDIX VR-1

INTRODUCTION

California Energy Commission, Environmental Protection Office staff (staff) assess if a proposed project and a forecasted publicly visible water vapor plume (visible plume) that may be emitted at operation by the project, potentially create a significant aesthetic effect on the environment according to policies in the California Environmental Quality Act (CEQA) (California Public Resources Code § 21000 et seq.).

The “State CEQA Guidelines”¹ defines a “significant effect on the environment” to mean *“a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance”* (14 California Code of Regulations §15382).

This appendix presents staff’s procedure for evaluating a selected key observation point for a proposed project and a visible plume that may be emitted by the proposed project for the purpose of addressing CEQA and the State CEQA Guidelines specific to aesthetics.

The determination of significance under CEQA, as identified by staff in this appendix, is based to the extent possible on scientific and factual data specific to the issues found under Aesthetics, Appendix G of the State CEQA Guidelines², thresholds recommended by other public agencies or subject matter experts, performance and professional standards, and thresholds identified by staff as supported by “substantial evidence.”³

Staff reviews aerial photographs and other photographs, photographic simulations, maps, and visits the selected key observation point location(s), the project site and vicinity to determine if a proposed project and its visible plume would *“substantially degrade the existing visual character or quality of the project site and its surroundings”* (Aesthetics, Appendix G, State CEQA Guidelines).

¹ The “State CEQA Guidelines” are provided by the California Resources Agency to detail guidance on how agencies should comply with CEQA. The State CEQA Guidelines are codified at the California Code of Regulations, Title 14, Division 6, Chapter 3, Articles 1-20 (Sections 15000-15387). Each public agency is responsible for complying with CEQA and the State CEQA Guidelines (14 Cal. Code Regs. §15020).

² California Code of Regulations, Title 14, Division 6, Chapter 6, Article 20, Appendix G - Environmental Checklist. The initial study/environmental checklist contained therein is only a sample that may be modified as necessary to suit the lead agency and to address the particular circumstances of the project under consideration (California Natural Resources Agency, “Final Statement of Reasons for Regulatory Action,” pg. 74, December 2009).

³ “Substantial evidence” as used in the State CEQA Guidelines means enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached . . . Substantial evidence shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts (14 Cal. Code Regs. §15384).

I. KEY OBSERVATION POINTS

It is difficult to describe visual appearance in words, visual assessments of the existing environment and the consequences of project alternatives should be based on *illustrations of actual views*. Because resources and time are always limited, it is also necessary to limit the number of views analyzed: it is essential that these be *representative views*, neither understating nor overstating the visual effects of the project. Viewpoint selection may be even more important to credible visual analysis than artistic sophistication.⁴

Staff uses a key observation point instead of viewpoint in its analysis. Staff has defined a “*key observation point*” (KOP) as a publicly accessible location that represents a critical surface area where the proposed project would be most open to view (revealing) to the public (e.g., a recreational or residential area, travel route, waterway, historic or scenic location).⁵ A KOP may also represent a primary public viewer group(s) that would be affected by the proposed project (e.g., trail and park users, river and floatboat users). Staff participates in the selection of the KOP(s) with the applicant.

The applicant provides color photograph(s) showing an actual view of the existing physical environment from the selected KOP(s) towards the proposed project site (*existing condition*), and photographic simulation(s) that show the proposed project as it would actually be viewed by people, and most clearly display its visual effects in the existing physical environment from the KOP(s) (*proposed condition*). Selecting views which “show off” particular design features or give the best impression of a project, be it at its most dramatic or least intrusive is not valid.⁶

The KOP existing condition photograph and the KOP proposed condition photographic simulation are provided at similar scale to allow reproduction of the images at life-size scale when they are printed on 11” x 17” paper.⁷ The existing condition photographs and the proposed condition photographic simulations are provided in the applicant’s application and are attached to the staff’s visual analysis for a proposed project.

⁴ “Foundation for Visual Project Analysis,” edited by R. C. Smardon, J. F. Palmer, and J. P. Felleman, Wiley, 1986, pg. 225.

⁵ The use of a key observation point (KOP) or similar type observation point (e.g., observer viewpoint, landscape control point) is common in federal public agency aesthetic/visual resources analysis. The U.S. Department of Interior, Bureau of Land Management defines a “*key observation point*” (KOP) as “one or a series of points on a travel route or at a use area or a potential use area, where the view of a management activity would be most revealing” (U.S. Department of Interior, Bureau of Land Management — Manual 8400 Visual Resources Management, pg. 6). The Federal Highway Administration uses “*observer viewpoint*,” defined as “a point from which a selected view is analyzed and/or evaluated. Analogous concept: Landscape control point (Litton).” (U.S. Department of Transportation, Federal Highway Administration, “Visual Impact Assessment for Highway Projects” (FHWA-HI-88-054), March 1981, Reprinted 1983, pg. 27). A “*landscape control point*,” used by the U.S. Department of Agriculture, Forest Service, is defined as a “fixed station from which a broad, intermediately distant view of the landscape may be seen.” “Criteria for LCP (*landscape control point*) affecting their location and use involve relationships to: (a) roads and trails, air routes; (b) areas of congregation and concentrated use; (c) overviews covering landscapes of special value; (d) places and conditions offering best viewing opportunities; and (e) overlapping fields of view and different views of the same landscape segment” (R. Burton Litton, Jr. “Landscape Control Points: a procedure for predicting and monitoring visual impacts,” USDA Forest Service Research Paper PSW-91, Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif., 1973, pg. 1 and pg. 4).

⁶ “Foundation for Visual Project Analysis,” edited by R. C. Smardon, J. F. Palmer, and J. P. Felleman, Wiley, 1986, pg. 192.

⁷ Staff assesses the representativeness of a photographic simulation by printing out an 11” x 17” sized color photographic simulation(s), taking it to the location of the selected key observation point, extending the photographic simulation 10 inches from the viewer’s eyes lined up with the horizon.

Staff reviews the submitted photographs showing the existing condition and the proposed condition photographic simulations using the eight factors shown on the **Key Observation Point Evaluation Diagram**. Staff assesses the visual sensitivity of the existing landscape, and the visual change introduced to the landscape by the project at operation (project effect) to determine the proposed project's visual impact significance to the selected KOP. Staff also uses aerial photographs and other photographs, maps, and visits the KOP(s), the project site and vicinity in this evaluation.

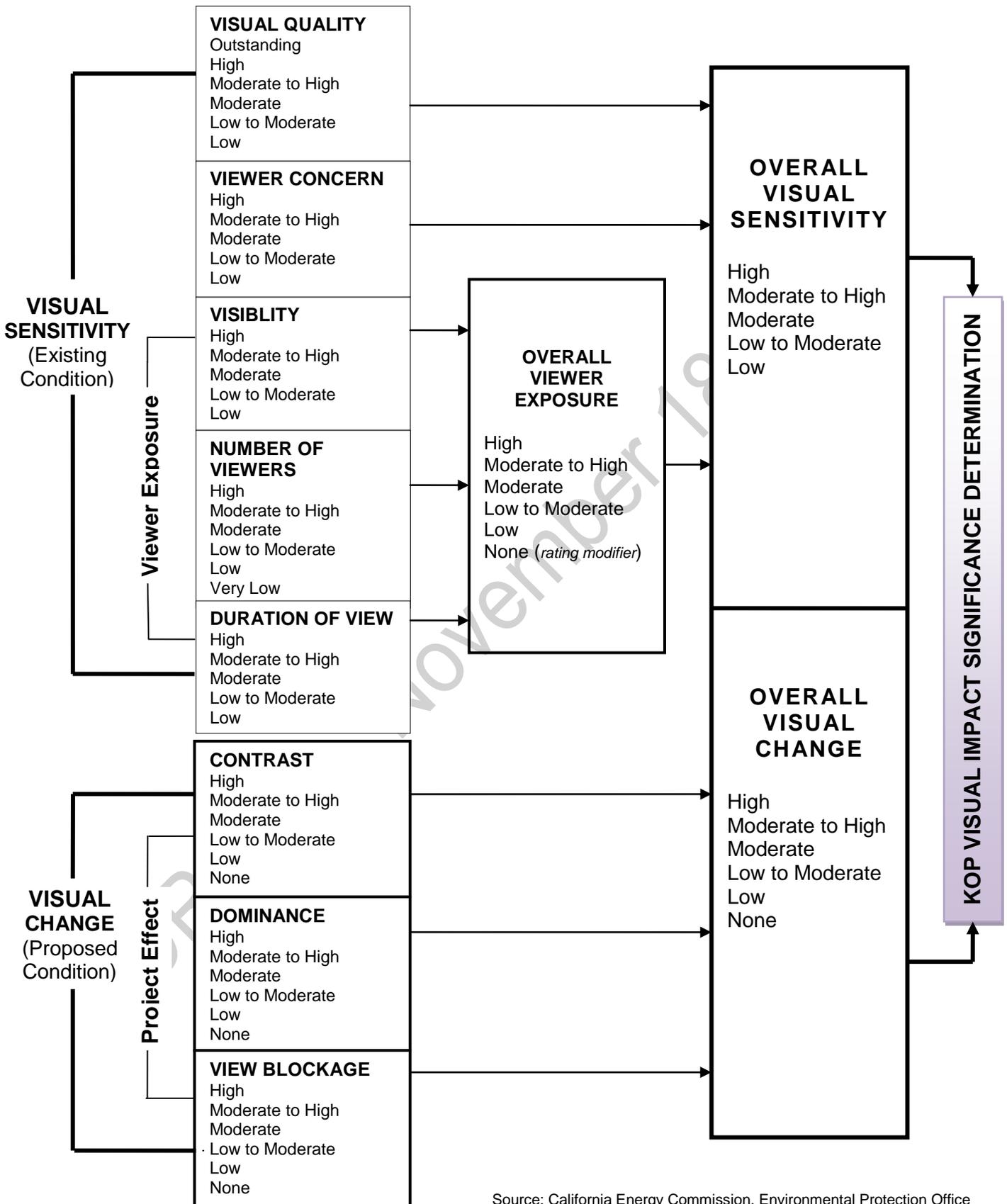
Distance Zone

Staff uses a five (5) mile distance zone around a proposed project site in the selection of the KOP(s). Several federal public agencies use a similar distance zone. The U.S. Bureau of Land Management subdivides landscapes into three (3) distance zones based on relative visibility from travel routes or observation points. The three zones are foreground-midground, background, and seldom seen. Foreground-midground zone includes areas seen from highways, rivers, or other viewing locations which are less than three to five miles away. Areas beyond the foreground-midground zone but usually less than 15 miles away are in the background zone. Areas not seen as foreground-midground or background are in the seldom-seen zone.⁸ The U.S. Forest Service subdivides landscape viewing into four (4) distance zone classifications; immediate foreground = 0 to 300 feet, foreground = 300 feet to ½ mile, midground = ½ mile to 4 miles, and background = 4 miles to the horizon.⁹

⁶ U.S. Department of Interior, Bureau of Land Management — Manual Handbook 8410-1, Visual Resources Inventory, Distance Zones, pg. 4.

⁹ U.S. Department of Agriculture, Forest Service - Agriculture Handbook Number 701. Landscape Aesthetics, A Handbook for Scenery Management. December 1995, pg. 4-5.

Key Observation Point Evaluation Diagram



Source: California Energy Commission, Environmental Protection Office

VISUAL SENSITIVITY (Existing Condition Without Project)

Visual sensitivity involves evaluating the existing physical environment from the KOP using the following factors: *visual quality*, *viewer concern*, *visibility*, *number of viewers*, and *duration of view* to achieve the *overall viewer sensitivity*. The visual sensitivity factors are described below.

Visual Quality

Visual quality is an expression of the visual impression or appeal of a given landscape¹⁰ and the associated public value (rating) attributed to it. Landscapes that contain comfortable spaces for people or pleasant places for people to be in have higher visual quality. People feel comfortable in landscapes that appear to offer opportunities for reflection. Landscapes that contain this attribute have higher visual quality.¹¹

The presence of natural features has an influence on visual quality. People are often fascinated or intrigued by visually significant natural features. A visually significant natural feature is one that sets a landscape apart from a similar landscape that does not contain the natural feature. The degree of influence a natural feature has on visual quality depends on how visible or visually apparent the feature.¹²

Generally, visually significant man-made alterations of the landscape or structures in the natural landscape have a negative influence on visual quality. The extent to which man-made structures and alterations either have a negative impact on the visual quality of the natural landscape or inspired awe depends on how visual they are in the landscape.¹³

Table 1 provides a landscape visual quality scale found in the article *An AI Methodology for Landscape Visual Assessments*,” prepared by Gregory J. Buhyoff, Patrick A. Miller, John W. Roach, Dan Zhou, and Leslie G. Fuller from Virginia Polytechnic Institute and State University, Blacksburg, Virginia.

¹⁰ A section or expanse of scenery, usually extensive, that can be seen from a single viewpoint.

¹¹ G.J. Buhyoff, P.A. Miller, J.W. Roach, D. Zhou, and L.G. Fuller. “An AI Methodology for Landscape Visual Assessments.” *AI Applications*. 1994, Vol. 8, No. 1, pg. 7.

¹² *Ibid.*, pg. 6.

¹³ *Ibid.*

Table 1

LANDSCAPE VISUAL QUALITY SCALE	
RATING	DESCRIPTION
Outstanding Visual Quality	A rating reserved for landscapes with exceptionally high visual quality. These landscapes are significant regionally and/or nationally. They usually contain interesting “natural features” that contribute to this rating. They would be what we think of when we think of “picture postcard” landscapes. People would be attracted to these landscapes to be able to view them.
High Visual Quality	This rating is for those landscapes that have high scenic quality value. This may be due to “man-made or natural features” contained in the landscape, to the “arrangement of spaces” contained in the landscape that causes the landscape to be visually interesting or a particularly comfortable place for people. These landscapes have high potential for recreational activities in which the visual experience is important.
Moderate to High Visual Quality	This rating is for landscapes which have above average scenic value, but are not of high scenic value. The scenic value of these landscapes may be due to “man-made or natural features” contained in the landscape, to the “arrangement of spaces” in the landscape or to the two-dimensional attributes of the landscape. These landscapes often have considerable recreational potential and visual quality.
Moderate Visual Quality	These are landscapes which have average scenic value. They usually lack significant “man-made or natural features.” Their scenic value is primarily a result of the “arrangement of spaces” contained in the landscape and the two-dimensional visual attributes of the landscape. These landscapes often have considerable recreation potential and visual quality.
Low to Moderate Visual Quality	These are landscapes which have below average scenic value but not low scenic value. They may contain visually discordant man-made alterations, but the landscape is not dominated by these features. They often lack “spatial arrangements**” which provide comfortable places for people and provide little interest in terms of two-dimensional visual attributes of the landscape. These landscapes often have limited recreation potential or provide limited opportunities for recreational activities in which the visual experience is less important.
Low Visual Quality	These are landscapes which have low scenic value. The landscape is often dominated by visually discordant man-made alterations; or they are landscapes with “spatial arrangements” which do not provide comfortable places for people and lack interest in terms of two dimensional visual attributes. These landscapes often have little recreational potential. Management concerns for visual quality either address rehabilitation of visually discordant man-made alterations or are limited to minimizing adverse visual impact.
<p>**“Spatial arrangement” is the promise of additional information if one could move into and through the landscape. This aspect is important to people’s cognitive map or understanding of the landscape.</p> <p>Source: G.J. Buhyoff, P.A. Miller, J.W. Roach, D. Zhou, and L.G. Fuller. “An AI Methodology for Landscape Visual Assessments.” <i>AI Applications</i>. 1994, Vol. 8, No. 1, pg. 9.</p>	

Viewer Concern

Viewer concern is an observer’s anticipated awareness and appreciation of the existing public view; interest in preserving the existing physical environment. Table 2 lists examples of publicly accessible view locations identified by the U.S. Department of Agriculture, Forest Service, the U.S. Department of Agriculture, Soil Conservation Service, the U.S. Department of the Interior, Bureau of Land Management, and the U.S. Department of Transportation and the sensitivity rating assigned to the view by them

that was presented in the Final Environmental Impact Report Tranquillon Ridge Oil and Gas Development Project (Santa Barbara County EIR No.: 06-EIR-000000-00005, State Clearinghouse No.: 2006021055).

Table 2

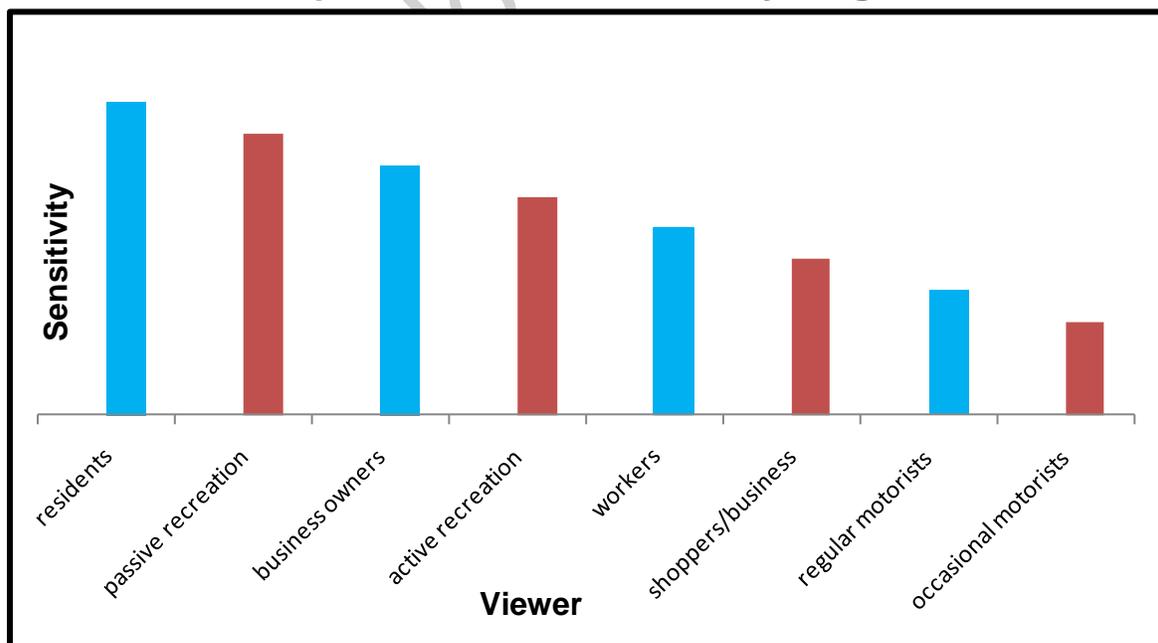
VIEWER CONCERN SCALE	
SENSITIVITY RATING	DESCRIPTION
High	<p>Views of and from areas the aesthetic values of which are protected in laws, public regulations and policies, and public planning documents.</p> <p>Views of and from designated areas of aesthetic, recreational, cultural, or scientific interest, including national, state, county, and community parks, reserves, memorials, scenic roads, trails, interpretive sites of scientific value, scenic overlooks, recreation areas, and historic structures, sites, and districts.</p> <p>Views from resort areas or urban residential subdivisions.</p> <p>Views from national- or state-designated scenic highways or roads, or designated scenic highways or roads of regional importance and from segments of travel routes, such as roads, rail lines, pedestrian and equestrian trails, and bicycle paths near designated areas of aesthetic, recreational, cultural, or scientific interest leading directly to them. Views seen while approaching an area of interest may be closely related to the appreciation of the aesthetic, cultural, scientific, or recreational significance of that destination.</p>
Moderate	<p>Views from segments of travel routes near highly sensitive use areas of interest, serving as a secondary access route to those areas.</p> <p>Views from rural residential areas and segments of roads near them, which serve as their primary access route.</p> <p>Views of and from undesignated but protected or popularly used or appreciated areas of aesthetic, recreational, cultural or scientific significance at the local, county, or state level.</p> <p>Views from highways or roads locally designated as scenic routes and of importance only to the local population, or informally designated as such in literature, road maps and road atlases.</p> <p>Views from travel routes, such as roads, trails, bicycle paths, and equestrian trails leading directly to protected or popularly used undesignated areas important for their aesthetic, recreational, cultural, or scientific interest.</p> <p>Views of and from religious facilities and cemeteries.</p>
Low	<p>Views from travel routes serving as secondary access to moderately sensitive areas.</p> <p>Views from farmsteads, groupings of fewer than four residences, industrial, research/development, commercial, and agricultural use areas.</p>
Source: Tranquillon Ridge Oil and Gas Development Project Environmental Impact Report, pg. 5.13-5-6, April 2008.	

Viewer concern can vary depending on the characteristics and preference of a viewer group. Residents are very interested in changes in views from their residence. Viewer concern for residential viewers is often considered high. Recreational sightseers may be highly sensitive to any changes. Regular viewers from a commercial or industrial area largely consist of employees and patrons (commercial area viewers). These viewers tend to focus their attention on the services and products associated with the commercial/industrial use on the site.

Viewer concern for motorists generally depends on when and where travel occurs, the angle of observation, view distance, and the frequency of travel by the motorist in the particular area. For example, a daily commuter who experiences normal freeway speeds generally has an increased awareness of views from the freeway. A daily commuter using an inner city freeway in heavy traffic would primarily be focused on the freeway itself and the drive. Motorists who are local residents and/or business owners typically have a higher concern due to their personal investment and greater familiarity with the local area.

The Final Environmental Impact Statement/Environmental Impact Report for the State Route 22/West Orange County Connection Project, dated March 2003, included a diagram showing the comparative viewer sensitivity of the various types of viewers in the State Route 22/West Orange County Connection viewshed.¹⁴ The project conducted by the Orange County Transportation Authority and the California Department of Transportation improved a 13 mile segment of State Route 22, known as the West Orange Connection, from the Interstate 405/605 interchange to State Route 55 in Orange County, California.

Comparative Viewer Sensitivity Diagram



Source: State Route 22/West Orange County Connection Project FEIS/EIR, pg. 3.13-1, March 2003.

¹⁴ State Route 22/West Orange County Connection Project FEIS/EIR, pg. 3.13-1, March 2003.

Visibility

Visibility is an assessment of how easily seen or noticed; readily visible or observable, a proposed project would be from the KOP. Visibility depends on the angle or direction of view, and the extent of existing human-made and natural visual screening (e.g., buildings or structures, landscape elements, topography). Visibility is determined by considering any and all obstructions that may be in the sightline. Would the visibility of the proposed project be dependent on the season (e.g., screened by summer foliage but exposed during winter)? The visibility rates from low to high.

Number of Viewers

Number of viewers is the estimated number of individuals who may see the proposed project from the KOP. Estimating the number of viewers may include using the number of residences, the Annual Average Daily Vehicle Trips (AADT) on a surface street or highway, or the number of individuals per day participating in a recreational activity. Table 3 provides a rating for the number of viewers.

Table 3

NUMBER OF VIEWERS			
Residential (number of residences)	Recreationists (number of individuals per day)	Motorist (number of motor vehicles per day)	Rating
More than 100	More than 200	More than 10,000	High
51-100	101-200	5,001 to 10,000	Moderate to High
21-50	51-100	2,501-5,000	Moderate
6 to 20	26-50	501-2,500	Low to Moderate
2 to 5	11 to 25	125-500	Low
None or 1	Less than 10	Less than 125	Very Low
Source: California Energy Commission, Environmental Protection Office ¹⁵			

Duration of View

Duration of view is the estimated length of time of the view by an observer of the proposed project from the KOP. The view duration varies depending on the viewer and the activity in which the viewer is engaged or focused. A view from a residence towards a proposed project longer than two minutes would be considered a high duration of view depending on the orientation of the residence. For a motorist, the duration of view depends on the speed of travel, view distance, and angle of observation. A motorist traveling 60 miles per hour on a highway having a direct view of a proposed project,

¹⁵ During the year spanning 2000-2001, California Energy Commission visual resources technical staff and consultants met in a series of meetings to develop procedures to assess aesthetics and visual resources related impacts introduced by a proposed power generating station for the purposes of addressing CEQA and the State CEQA Guidelines. The design-based classification assessment created by the visual resources group consists of a hybrid of the U.S. DOI, BLM Visual Resources Management system, the USDA Forest Service Visual Management System and subsequent Scenery Management System, and includes aspects of the Federal Highway Administration, Visual Impact Assessment for Highway Projects. The design-based classification assessment included the creation of several visual resources guidance tables (Viewer Exposure, Overall Visual Sensitivity, Overall Visual Change, and Impact Significance). Other tables and diagrams have been subsequently added to the assessment. The original visual resources group members who participated in these technical meetings included the following: Energy Commission staff - Dale Edwards, Eric Knight, and Gary Walker (technical lead); and, consultants - Joe Donaldson from Jones & Stokes Associates, Michael Clayton of Michael Clayton & Associates, and William Kanemoto of William Kanemoto & Associates.

where the approximate initial point of observation to the project is one mile away would have a 60 second duration of view.

The duration of view for recreationists will vary depending on whether the particular outdoor recreation activity is “active” or “passive.” Active recreation entails direct participation in an activity and typically requires use of an organized play area (e.g., a sports field such as a football or soccer field, or an off-highway vehicle area). An individual observing or engaged in these activities is likely to be focused on the activity at hand and less on the periphery. The duration of view for an observer of the activity or a participant in it of a proposed project is likely to be low to moderate.

Passive recreation activities often occur in tranquil, peaceful and solitary environments. In the outdoors the activities foster appreciation and understanding of the elements of the "natural environment" or wilderness (wild animals, rocks, forest, beaches), in general those things that have not been substantially altered by human intervention. The activities primarily require human muscle-power. Examples include bird watching, hiking, and rock climbing. The duration of view for an observer of a proposed project can be for an extended period.

Staff uses the following table to establish a rating for the duration of view.

Table 4

DURATION OF VIEW	
Length of Time	Rating
Longer than 2 minutes	High (extended period)
1 minute to 2 minutes	Moderate to High
20 seconds to 60 seconds	Moderate (mid-length period)
10 to 20 seconds	Low to Moderate
Less than 10 seconds	Low (brief period)
Source: California Energy Commission, Environmental Protection Office ¹⁶	

Overall Viewer Exposure

Overall viewer exposure involves totaling the factors *visibility*, *number of viewers*, and *duration of view*. Staff’s premise under *overall viewer exposure* is that any proposed project introduced to the existing physical environment is exposed to a viewer, therefore rating at least a “low” or “very low.” However in unique cases, staff may adjust one or more of the three factor(s) to include a rating of “none” (a rating modifier). An example where this would be applicable using the factor *visibility*, if a view of the proposed project would be completely screened from the public by existing massive buildings or topography. The visibility factor could rate as none. Overall viewer exposure normally rates from low to high.

Overall Visual Sensitivity

Overall visual sensitivity is staff’s estimated rating of the public viewer’s sensitivity of the existing physical environment from the KOP considering *visual quality*, *viewer concern*, and *overall viewer exposure*. Overall visual sensitivity rates from low to high.

¹⁶ Ibid.

VISUAL CHANGE (Proposed Condition With Project)

Visual change involves evaluating the proposed project effect introduced to the existing physical environment from the KOP using the factors of *contrast*, *dominance*, and *view blockage* to achieve the *overall visual change*. The visual change factors are described below.

Contrast

Assigning values to visual resources is a subjective process. The phrase, “beauty is in the eye of the beholder,” is often quoted to emphasize the subjectivity in determining scenic values. Yet, researchers have found consistent levels of agreement among individuals asked to evaluate visual quality. Designers have used the basic design elements of *form*, *line*, *color*, and *texture* to describe and evaluate landscapes for hundreds of years.¹⁷

Contrast is measured by comparing the proposed project’s major buildings, structures and equipment with prominent human-made and natural features in the existing landscape using the basic design elements of form, line, color, and texture.¹⁸

Modifications in a landscape which repeat the landscape’s basic design elements are said to be in harmony with their surroundings. Repeating these elements reduces contrasts between the landscape and the proposed activity or development and results in less of a visual impact.¹⁹ The “basic design elements” are described as follows:

Form - contrast in form results from changes in the shape and mass of landforms or structures. The degree of change depends on how dissimilar the introduced forms are to those continuing to exist in the landscape.

Line - contrast in line results from changes in edge types and interruption or introduction of edges, bands, and silhouette lines of shapes or masses in the landscape. New lines may differ in the sub-elements of visual strength of a line (boldness), degree of simplicity or intricacy of a line (complexity), and overall relationship of the line to the horizontal axis of the landscape (orientation) from existing lines.

Color – contrast in color results from changes in the degree of lightness or darkness (value), or a gradation or variety of a color (hue), the degree of saturation or brilliance of a color (chroma), and reflectivity.²⁰

¹⁷ U.S. Department of Interior, Bureau of Land Management, Manual Handbook 8400 Visual Resources Management, “Overview of Visual Resource Management System,” pg. 4.

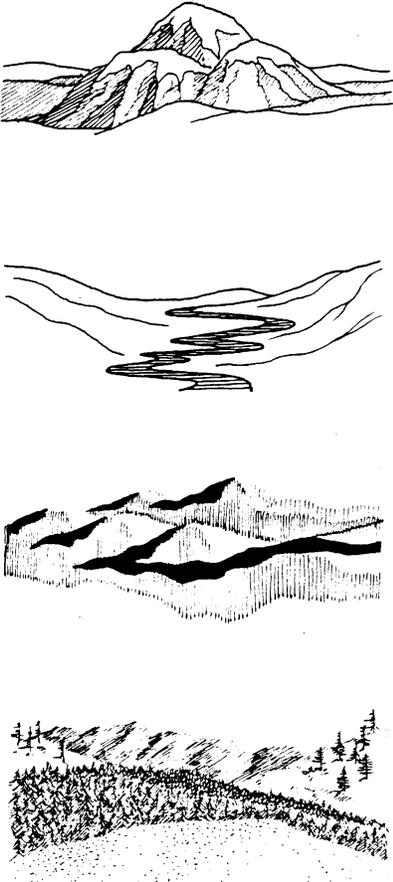
¹⁸ U.S. Department of Interior, Bureau of Land Management, Manual Section 8431 - Visual Resources Contrast Rating Management, pg. 2.

¹⁹ U.S. Department of Interior - Bureau of Land Management, Visual Resources Management – Design Techniques, “Repeating the Elements of Form, Line, Color, and Texture,” pg. 1.

²⁰ Reflectivity from the surface of an object (e.g., building surface) depends on the intensity of the light striking it, the age and type of material used, its location, position and gradient, the particular time of day and year, and the position of the sun (“Reflectivity From Existing Building Surfaces,” BlueScope Steel, 2007). All surfaces reflect light. Visual reflectance is caused by white light being

Texture - noticeable contrast in texture usually stems from differences in the relative dimensions of the surface variations (grain), spacing of surface variations (density), and the degree of uniform recurrence and symmetrical arrangement of the surface variation (regularity).²¹

VISUAL PATTERN ELEMENTS



Form
visual mass, bulk or shape of an object.

Line
horizons, silhouettes, edges of areas; man-made development.

Color
reflected hue (red, blue, yellow) and value (light and dark).

Texture
apparent coarseness of visual surface.

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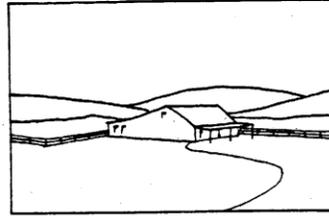
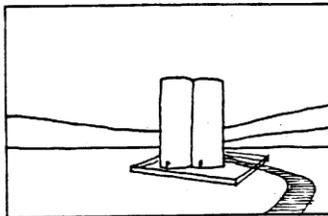
Source: U.S. Department of Transportation, federal highway Administration, "Visual Impact Assessment for Highway Projects" (FHWA-HI-88-054), pg. 40, March 1981.

reflected. If large amounts of white light are reflected in a bundled it is called glare ("A Guide To Reducing Glare And Reflection In The Queenstown Lakes District," Civic Corporation Limited).

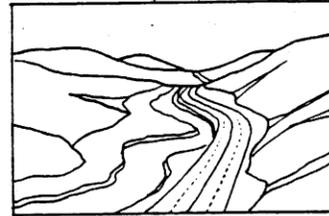
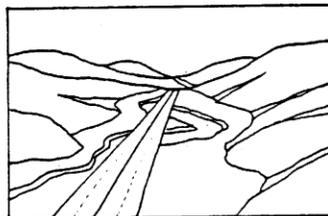
²¹ U.S. Department of Interior, Bureau of Land Management, Manual Section 8431 - Visual Resources Contrast Rating Management, pg. 5.

COMPATIBILITY: PATTERN ELEMENTS

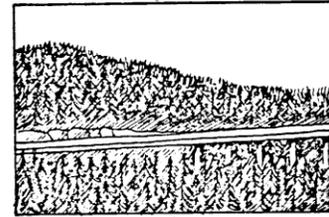
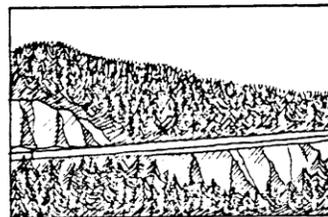
Form



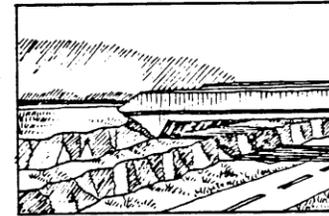
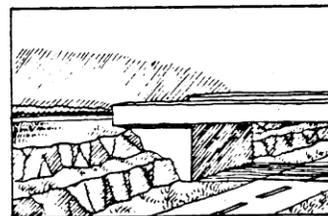
Line



Color



Texture



84

Source: Ibid, pg. 84.

Strong contrast between the visual character of a project and that of its setting is an important indicator of potential visual impact (Appleyard and Fishman 1977). Important aspects of visual character include form (the height, bulk, and shape of structures), line (setbacks, roof lines, floor and window levels), color and texture (structure materials, site improvements), scale or apparent size (plant materials and details of structures), proportion (the relationships between horizontal and vertical dimensions), and rhythm (the spacing of repeated elements).²²

²² "Foundation for Visual Project Analysis," edited by R. C. Smardon, J. F. Palmer, and J. P. Felleman, Wiley, 1986, pg. 239.

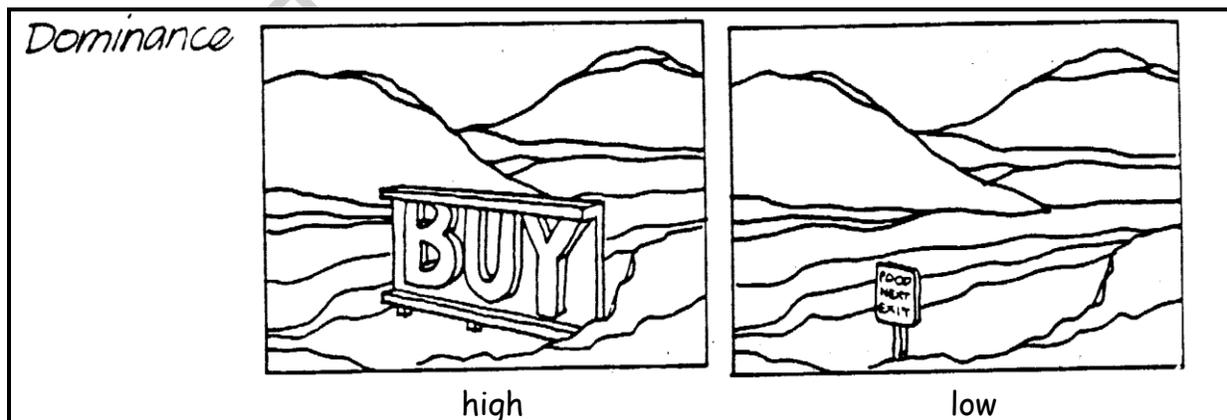
Table 5 provides a contrast assessment table for a proposed project's major buildings, structures and equipment.

Table 5

CONTRAST ASSESSMENT							
KOP Location	Basic Design Elements	Degree of Contrast					
		High	Moderate to High	Moderate	Low to Moderate	Low	None
	Form						
	Line						
	Color						
	Texture						
Degree of Contrast Criteria*				Rating			
The contrast demands attention, will not be overlooked, and is dominant in the landscape.				High (strong contrast)			
				Moderate to High			
The contrast begins to attract attention and begins to dominate the characteristic landscape.				Moderate			
The contrast can be seen but does not attract attention.				Low to Moderate (weak contrast)			
				Low			
The contrast is not visible or perceived.				None			
*Source: U.S. Department of Interior, Bureau of Land Management, Manual 8431 - Visual Resource Contrast Rating, pg. 4							

Dominance

Dominance is “the proportionate size relationship between an object and the surroundings in which it is placed.”²³ Would the proposed project’s major buildings, structures and equipment occupy or be in a commanding or elevated position in the existing view? How dominant a project feature would be in the existing view also depends on the distance to the observer. Table 6 provides a dominance assessment.



Source: adapted from U.S. Department of Transportation, Federal Highway Administration, “Visual Impact Assessment for Highway Projects” (FHWA-HI-88-054), pg. 85, March 1981.

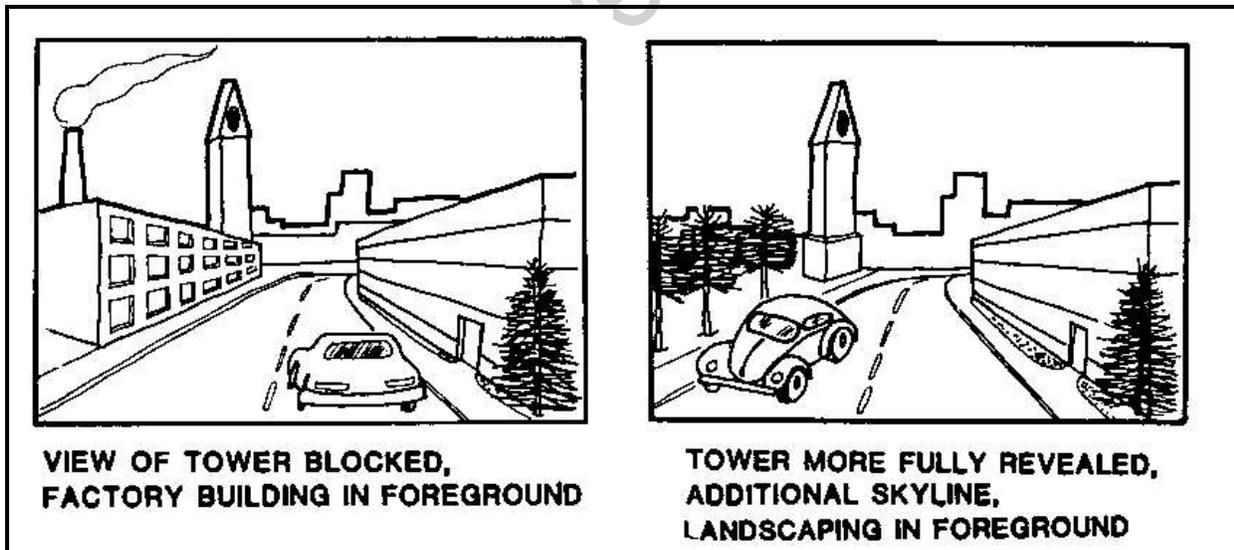
²³ U.S. Department of Interior, Bureau of Land Management, Manual Section 8431 - Visual Resources Contrast Rating Management, Illustration 7.

Table 6

DOMINANCE ASSESSMENT	
Measurement Description	Rating
a. Estimate the proportion of the <i>visual field</i> * that the proposed project feature would occupy. b. Estimate the proposed project feature's apparent size relationship to existing human-made and natural features contained within the landscape. c. Estimate the conspicuousness (<i>how easily seen or noticed</i>) of the proposed project feature due to its location in the visual field.	High (dominant)
	Moderate to High
	Moderate (co-dominant)
	Low to Moderate
	Low (subordinate)
	None
* The entire expanse of space visible at a given instant without moving the eyes. ²⁴	
Source: California Energy Commission, Environmental Protection Office	

View Blockage

View blockage is the extent that a prominent human-made and natural feature(s) within the existing landscape would be obstructed from public view by the proposed project's buildings, structures and equipment. Estimate the degree of view blockage. View blockage rates from none to high.



Source: "Foundation for Visual Project Analysis," edited by R. C. Smardon, J. F. Palmer, and J. P. Felleman, Wiley, 1986, pg. 161.

Overall Visual Change

Overall visual change is staff's estimated rating of the proposed project effect introduced to the existing physical environment from the KOP considering *contrast*, *dominance*, and *view blockage*. Overall visual change rates from none to high.

²⁴ Dictionary.com.

KOP VISUAL IMPACT SIGNIFICANCE DETERMINATION

The KOP Visual Impact Significance Determination involves comparing the rating for *Overall Visual Sensitivity* and *Overall Visual Change* using the following table.

Table 7

OVERALL VISUAL SENSITIVITY	OVERALL VISUAL CHANGE				
	High	Moderate To High	Moderate	Low to Moderate	Low
High	Significant*	Significant	Significant	Less Than Significant	Less Than Significant
Moderate to High	Significant	Significant	Potentially Significant	Less Than Significant	Less Than Significant
Moderate	Significant	Potentially Significant	Less Than Significant	Less Than Significant	Less Than Significant
Low to Moderate	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant	Insignificant
Low	Less Than Significant	Less Than Significant	Less Than Significant	Insignificant	Insignificant

*The proposed project's building(s), structure(s), and/or equipment would substantially degrade the existing visual character or quality of the site and its surroundings for the purposes of CEQA and the State CEQA Guidelines. Architectural design and landscape treatments cannot mitigate the visual impacts of the proposed project. An alternative project design may be necessary to avoid highly adverse visual related impacts.

The State CEQA Guidelines defines a "significant effect on the environment" as a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance (14 Cal. Code Regs. §15382).

Source: California Energy Commission, Environmental Protection Office

II. PUBLICLY VISIBLE WATER VAPOR PLUMES

Staff assess if a forecasted publicly visible water vapor plume (visible plume) emitted by a proposed thermal power generation facility "would substantially degrade the existing visual character or quality of the project site and the surrounding area," and create a "substantial adverse effect on a scenic vista" (Aesthetics, Appendix G, State CEQA Guidelines).

When a cooling tower²⁵ for a thermal power generation facility is in operation, the warm moisture (water vapor) filled exhaust emitted from the cooling tower fan stack will

²⁵ A cooling tower is a heat rejection device which extracts waste heat to the atmosphere through the cooling of a water stream to a lower temperature. The type of heat rejection in a cooling tower is termed "evaporative" in that it allows a small portion of the water being cooled to evaporate into a moving air stream to provide significant cooling to the rest of that water stream. The heat from the water stream transferred to the air stream raises the air's temperature and its relative humidity to 100%, and this air is discharged to the atmosphere ("What is a (wet, atmospheric) cooling tower?", Cooling Technology Institute).

condense as it rises depending on the ambient air temperature and relative humidity.²⁶ When the exhaust and ambient air mix the resultant plume may be more saturated in water content than the carrying capacity at the mixed plume/air temperature, so that condensing microscopic water vapor droplets form as the plume cools and mixes with the ambient air. The condensing microscopic droplets of water refract sun light at different angles appearing as a white to gray colored plume (see photograph below). The appearing plume (visible plume) may at times be very noticeable to a community and perceived as aesthetically displeasing.



Lake Side Power Station at Vineyard, Utah a 545 megawatt natural gas fired turbine power generating station operating its cooling tower (10 cell) during early morning on February 28, 2008. Notice the water vapor plume (visible plume) emitted from the cooling tower. Photograph by Mscalara. Source: "Lake Side Power Station." [Wikipedia](#), 2008. Wikipedia Foundation, Inc. 12 October 2011.

Staff calculates plume frequency using the six month portion of the year, November through April (seasonal period), when the ambient air temperature and relative humidity are such that visible plumes are most likely to form.

Staff uses the Combustion Stack Visible Plume (CSVP) model²⁷ to forecast (predict) a proposed cooling tower's visible plume frequency and size at operation.²⁸ This model provides a conservative estimate for the plume frequency and plume size. If the CSVP model predicts a seasonal daylight "clear hour" plume frequency of 20 percent or greater, staff evaluates the "20th percentile plume."

²⁶ Relative humidity is the ratio of the fraction of water vapor in a given sample of moist air to the fraction in an air sample saturated at the same temperature and pressure.

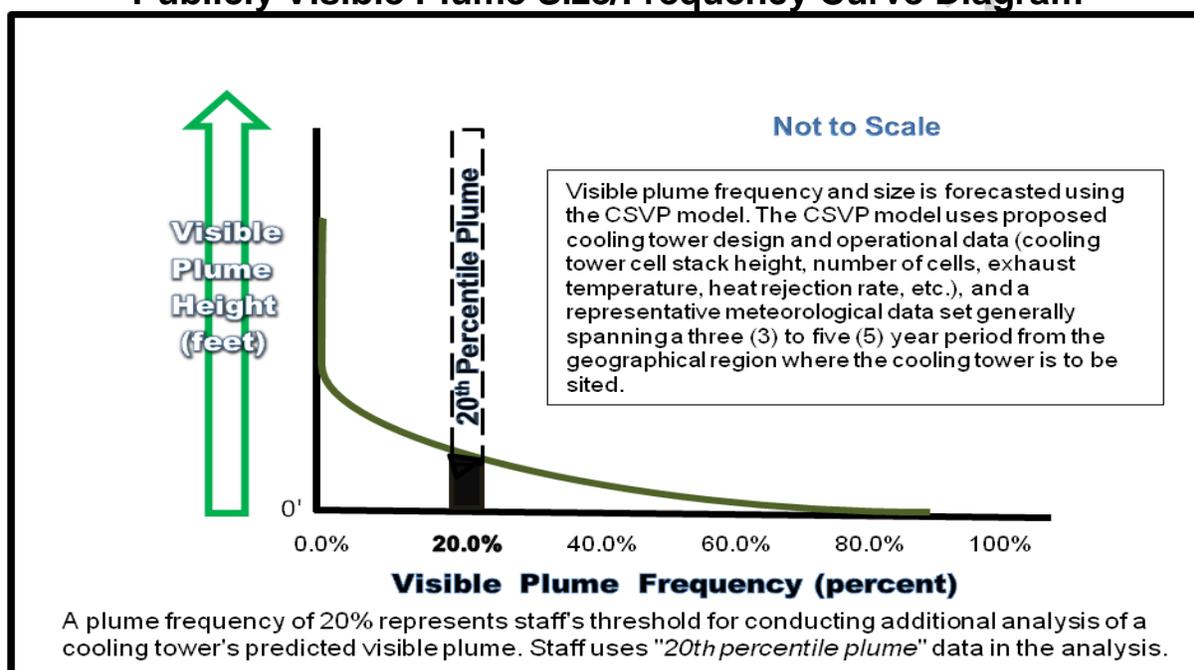
²⁷The CSVP model is used to estimate plume frequency and plume dimensions for the cooling tower exhaust. This model uses both hourly cooling tower exhaust parameters and hourly ambient condition data to determine plume frequency. The model is based on the algorithms of the Industrial Source Complex model (Version 2) that determine temperatures at the plume centerline. The model does not incorporate building downwash.

²⁸ Other potential thermal power generation facility visible plumes sources (e.g., combined cycle gas turbine exhausts, geothermal steam exhausts) are evaluated in the same manner as cooling tower emitted visible plumes.

In conjunction with the CSVP model, staff has defined “clear hours” as “daylight, no rain, no fog, high visual contrast hours,” and has created a “clear sky category”²⁹ to distinguish a sky minus (without) any clouds. It is during clear hours when a clear sky condition exists that a visible plume would show the greatest contrast with the sky. Visible plumes emitted during rain and fog conditions, other covered cloud conditions, or at nighttime would not introduce substantial contrast with the sky.

Staff has established a 20 percent (%) plume frequency during clear hours as a reasonable worst case scenario to conduct additional analysis of a cooling tower’s predicted visible plume. A plume that occurs more frequent than 20% of the time would be smaller in size than a plume that occurs less frequent than 20%. In other words, 80% of the time the size of a visible plume would be smaller than the 20th percentile plume.

Publicly Visible Plume Size/Frequency Curve Diagram



Source: California Energy Commission, Environmental Protection Office

As shown on the Publicly Visible Plume Size/Frequency Curve Diagram, using a visible plume frequency range 0 to 100%, a one (1) percentile plume could be extremely large

²⁹ Staff has identified a “clear sky category” for the purpose of determining high visual contrast hours, when a visible plume would have the greatest visual contrast with the sky. The specifics of the clear sky determination depends on the format of the available meteorological data set, but in general are based on separation of hours with clear, scattered/broken, and overcast sky conditions; where all clear hours and half of the scattered/broken sky cover hours are considered as part of the clear sky category. High visual contrast hours are determined for National Climate Data Center Hourly United States Weather Observation (HUSWO) meteorological data sets as follows: a) all hours with total sky cover equal to or less than 10% plus; b) half of the hours with total sky cover 20-90%. The rationale for including these two components in the clear sky category is as follows:

- a) visible plumes typically contrast most with the sky under clear conditions, and when total sky cover is equal to or less than 10%. Clouds either do not exist or they make up such a small proportion of the sky that conditions appear to be virtually clear; and,
- b) for a substantial portion of the time when total sky cover is 20-90% the opacity of sky cover is relatively low (equal to or less than 50%). This sky cover does not always substantially reduce contrast with visible plumes. Staff has estimated that approximately half of the hours meeting the latter sky cover criteria can be considered high visual contrast hours and are included in the “clear sky” definition.

in size, very noticeable to a wide area, but would rarely occur. At 100% a visible plume would be nonexistent. Predicted visible plumes having less than a 20% frequency of occurrence are considered by staff to be insignificant for the purposes of CEQA and the State CEQA Guidelines due to limited plume frequency.

Staff analyzes the modeled 20th percentile plume dimensions and frequency, considering the *Overall Visual Sensitivity* and *Overall Visual Change* (see Key Observation Point Evaluation Diagram) from a key observation point(s), to determine if the visible plume predicted would substantially degrade the existing visual character or quality of the project site and surrounding area, and if it would create a substantial adverse effect on a “scenic vista.”³⁰

III. PUBLICLY VISIBLE WATER VAPOR PLUME ABATEMENT

Staff has identified several ways to lower plume frequency and abate or eliminate a publicly visible water vapor plume(s) emitted from a cooling tower.

Increase Cooling Tower Air Flow - Increasing the cooling tower air flow will lower the exhaust temperature and reduce plume frequency, but would not eliminate the potential for visible plumes under all conditions. This method focuses on the design of the cooling tower fan flow capacity versus the amount of heat rejected in the cooling tower. Any specific cooling tower design needs to be fully modeled to determine the effective final plume frequency reductions.

Wet Surface Air Cooler - The basic operating principle of a wet surface air cooler (WSAC) is rejection of heat by evaporation. The fluid/vapor to be cooled or condensed flows through tube bundles in a closed-loop system. The cooling fluid(s) used for the intercooler and any auxiliary cooling systems could be piped directly into the WSAC which can operate as a non-contact heat rejection system that uses water sprays over the cooling pipes to increase the heat rejection when necessary. The expected hot temperature of the cooling fluid would increase the efficiency of this type of system. There may still be the potential for visible plumes under high cooling load periods during certain ambient air conditions, but the WSAC could be designed to maintain a minimal plume frequency well below 20% during “clear hours.”

Wet-Dry Cooling Tower - This type of cooling tower reduces visible plume formation by adding heat or heated ambient air to the saturated wet cooling section exhaust to

³⁰ The term “scenic vista” is not defined in CEQA or the State CEQA Guidelines. For the purposes of this analysis, staff has defined scenic vista as the following:

- A panoramic view of a publicly recognized broad landscape feature of visual concern such as a bay, a mountain range, or the ocean.
- A public view to a publicly recognized human-made or natural scenic feature of exceptional importance in the landscape such as a view of the Golden Gate Bridge spanning the entrance to San Francisco Bay or Niagara Falls in western New York.
- A public view from an actual designated view location such as a view overlook in a national/state forest or park, or a Caltrans public vista point along a highway.
- Scenic view locations designated in a federal, state or local government adopted land use planning related document (e.g., Resource Management Plan, General Plan, Local Coastal Plan, highway corridor plan), or cultural resources or historical preservation plan and survey.

reduce its saturation level. The saturated exhaust can be heated using a separate dry module above the wet cooling tower. Alternatively, outside air can be pulled into separated areas where a dry section heats the air to reduce humidity and a wet section creates warm, humid exhaust. The heated ambient air and humid exhaust are mixed to reduce the humidity of the combined exhaust steam to avoid creating a visible plume when meeting ambient air.

The amount of plume reduction that can be accomplished by this type of system can vary from a relatively moderate reduction to a significant reduction in visible plume frequency. The specific wet-dry design would be based on the desired degree of visible plume reduction.

Air Cooled Condenser (Dry Cooling) – The use of an air cooled condenser (ACC) would eliminate the formation of a visible plume. Air cooled condensers condense exhaust steam from the steam turbine inside finned tubes which are externally cooled by ambient air instead of water. Steam enters the air cooled condenser above the heat exchangers, flows downward through the heat exchanger tubes, where it condenses and is captured in pipes at the base of the heat exchangers. Mechanical fans force air over the heat exchangers. The condensate is then returned to the boiler water system. The air mass discharged from the ACC introduces heat but no water vapor to the ambient air.

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Appendix Visual Resources 2

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APPENDIX VISUAL RESOURCES 2

REVIEW TEAM: Gregg Wheatland, Todd Stewart, Brian Madigan, Brian Biering, Corinne Lytle Bonine

Introduction

The CEC's visual resource assessment guidelines used in this analysis are designed to address State CEQA guidelines pertaining to aesthetic resources. The approach used by the CEC (see Appendix B) includes components adopted from existing visual impact methodology developed by federal agencies (U.S. Department of Interior, Bureau of Land Management; the U.S. Department of Agriculture, Forest Service; and, the U.S. Department of Transportation, Federal Highway Administration). Because no procedures developed by federal agencies include significance thresholds, these measures have been developed exclusively by the CEC.

The CEC's approach to significance determination contends that the "significance of environmental effect under CEQA and the State CEQA Guidelines specific to physical and visible aesthetics identified in the PSA is based to the extent possible on scientific and factual data, performance and professional standards, thresholds recommended by public agencies or subject matter experts, and thresholds identified by staff as supported by substantial evidence." The term substantial evidence (as defined by CEQA Guidelines) is further defined as "enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached. Whether a fair argument can be made that the project may have a significant effect on the environment is to be determined by examining the whole record before the lead agency... Substantial evidence shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts," (14 Cal. Code Regs. §15384).

We contend that the significance determinations made in the PSA are not based on fact because they are based on assumed thresholds that are not predicated on fact. Because the thresholds in the CEC's Method are not based on fact, the PSA makes erroneous findings of impact significance. The following response is intended to provide background information on the methodology used in the PSA with an emphasis on identifying how assumptions made in the PSA result in overstated findings of significance.

1. Significance Determination Criteria

The PSA's significance determinations are based on the combined metrics of visual sensitivity and visual change (see Table 1 below), the individual components of which, are also defined below. Overall Visual Change is measured by considering visual contrast, spatial dominance, and view blockage. Visual Sensitivity is measured by considering visual quality, viewer concern, visibility, number of viewers, and duration of view.

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Though qualitative, the identified measures of visual change are arguably objective, particularly when implemented by a trained visual analyst. Therefore, this response does not focus on the analytical measures implemented to make the determinations made in the PSA. However, measures of visual sensitivity are based on assumptions that, in our assessment, lack sufficient factual basis. As illustrated in Table 1, the value assigned to either metric could have profound effects on the outcome of the significance determinations made in the PSA.

Table 1.0 Significance determination criteria proposed by the CEC (DRAFT Appendix VR-1).

Overall Visual Sensitivity	Overall Visual Change				
	High	Moderate To High	Moderate	Low to Moderate	Low
High	Significant ¹	Significant	Significant	Less Than Significant	Less Than Significant
Moderate to High	Significant	Significant	Potentially Significant	Less Than Significant	Less Than Significant
Moderate	Significant	Potentially Significant	Less Than Significant	Less Than Significant	Less Than Significant
Low to Moderate	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant	Insignificant
Low	Less Than Significant	Less Than Significant	Less Than Significant	Insignificant	Insignificant

¹The proposed project's buildings, structures, and equipment would substantially degrade the existing visual character or quality of the site and its surroundings for the purposes of CEQA and the State CEQA Guidelines. Architectural design and landscape element treatments cannot mitigate the aesthetic/visual impacts of the proposed project. An alternative project design may be necessary to avoid a substantially significant adverse visual impact.

Source: California Energy Commission, Environmental Protection Office

Measures of Visual Sensitivity

According to the CEC's method, the evaluation of Visual Sensitivity involves an assessment of the existing physical environment from a KOP using the factors of: visual quality, viewer concern, visibility, number of viewers, and duration of view to estimate the overall visual sensitivity. These individual factors of Viewer Sensitivity are described below.

Scenic Quality

The CEC Method states that generally, visually significant man-made alterations of the landscape or structures in the natural landscape have a negative influence on visual quality. The extent to which

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man-made structures and alterations either have a negative impact on the visual quality of the natural landscape or inspired awe depends on how visible they are in the landscape.

We disagree. There are many instances where man-made structures can (and do) harmonize with natural elements of the visual environment. We submit that this assumption has the effect of priming the analyst to view any additional man-made structure as a negative addition to that visual environment. This position instigates bias at the most basic level of analysis by asking the analyst to view man made development as a detriment to scenic quality.

Viewer Concern

Viewer concern is defined as a public viewer's anticipated awareness and appreciation of the existing public view; and interest in preserving that existing view. The PSA describes various types of views and the assumed level of concern each would reasonably receive. This classification is based on assumptions made when completing the Tranquillon Ridge Oil and Gas Development Project Final Environmental Impact Report (2008), and not on empirical data on the subject. Therefore, we submit this assumption does not accurately represent actual levels of viewer concern within the Project area.

Visibility

Visibility is defined by the CEC as an assessment of how easily seen or noticed a proposed project would be from a KOP. Visibility is determined by considering any and all obstructions that may be in the sightline, and depends on the angle or direction of view, and the extent of existing built and natural visual screening (e.g., buildings, structures, topography, trees). Visibility is rated from low to high; however no criteria or threshold is provided. Further, no discussion of how to incorporate viewer exposure into measurements of viewer duration is provided.

For example: The CEC's Method employed in this analysis does not provide a definition for what constitutes measures of high, moderate, or low visibility. To this end, the lack of definition for what constitutes this level of impact is therefore left to the analyst's interpretation and is therefore inherently subjective. For example, the discussion of Viewer Sensitivity for KOPs within the "I-10 Corridor" states that, "the community [of Mesa Verde] contains between 200 and 300 homes, including a substantial number with open views toward the project site to the south." According to Table 1 of the PSA, the "Visibility" of the Project from KOP 3 and 3b was determined Moderate. We note that the PSA fails to explain how "open views" equate to Moderate visibility. In this respect, we contend that the weight or consequence this factor disproportionately influences the determination of Viewer Sensitivity and level of impact significance.

Number of Viewers

Number of viewers is defined by the CEC as the estimated number of the total viewers in a viewer group (residential viewers, recreational viewers, etc.) who may be exposed to the proposed project from the KOP. An estimated number count may include the number of residences, the Annual Average Daily Traffic (AADT) on a surface street or highway, or the number of individuals participating in a recreational activity. Although it is clear how this metric informs the number of people who would see the project, it provides no standard "weighting" by which to understand the relationship of the number of viewers to visual sensitivity, particularly when the individual activity each viewer is engaged in could be substantially different.

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For example, according to Table 1 of the PSA, KOPs within the Palo Verde Valley area were assigned “Moderately Low” rating for Number of Viewers. Presumably this is due to the low number of people in the Project vicinity, however Page 4.13-19, 4th Paragraph, states, “residential numbers are considered relatively high. Traffic levels are moderately low (ADT, 2000). While visitor numbers at Jack E. Marlow Park are not known, they were estimated to be in a moderately high range (over 100/day) due to a high concentration of adjacent residents, and a variety of recreational facilities.” It is unclear how the PSA arrived at its final determination that the number of viewers was considered Moderately Low or why this finding is given equal weighting to other measures of Viewer Exposure and therefore Overall Visual Sensitivity. We contend this serves to inflate the overall determinations of significance.

Duration of View

Duration of view is the estimated length of time a viewer would have to view the Project from each KOP. The importance of the duration of view varies depending on the type of activity in which the viewer is engaged or focused.

The CEC Method rates a view of a project longer than 2 minutes as HIGH; conversely, a view of a project for less than 10 seconds would be LOW. We contend that, without context –(i.e., the total duration of a visual experience in coordination with consideration of the nature of that experience (i.e. are there competing views?)), that using this metric serves to inflate the actual range of duration of view a viewer may experience at any given time. For example, according to Table 1 of the PSA, viewer duration from Cibola National Wildlife Refuge was determined “High” as seen from KOP 5 and 5b. Within the discussion of Viewer Exposure, the PSA does not describe how this level was determined. Why was Viewer Duration determined “High”?

Using the CEC’s Method, any viewer experiencing a view of the Project for more than two minutes is considered to have a “High” duration of view. We submit that this does not provide an accurate measurement of impact because it does not provide context. It begs the question, “two minutes out of what?” An hour? Five hours? Five days? Five years? In this sense we recognize the intent of the Method is to provide a framework for analysis, but we contend greater effort should be placed on describing the context of each view, rather than conforming to individual impact levels intended to apply to any project located in any environment.

Overall Viewer Exposure

Overall viewer exposure involves totaling the assigned ratings for the factors of visibility, number of viewers, and duration of view. We contend that the process of “totaling” categorical data adds yet another layer of assumption and bias to the CEC’s Method. The PSA does not explicate what criteria are used to determine overall viewer exposure so it is not clear if certain factors are given greater weight than others.

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Conclusion

In the context of the above arguments, we recognize that both the Staff PSA and the AFC are based on many assumptions¹. These assumptions allow the analyst to make educated and informed significance and impact determinations. However, assumptions remain conventional expectations based on educated assessment of existing conditions. We argue that not all assumptions the PSA makes for Visual Sensitivity are equal, the impact of which carries the risk that certain factors of assumed conditions are factually under or overstated. Therefore, these under or overstated assumptions influence determination of significance and are factually inaccurate.

Because the findings and conclusions for Viewer Sensitivity and Visual Change (in the AFC and PSA) are based on numerous assumptions made throughout the course of each analysis, we offer the following contextual and comparative analysis to further explore and elucidate the extent to which the Project may impact the existing visual environment. In this manner we seek to investigate the extent to which viewers presently interact, and likely will continue to interact, with the visual environment of the Palo Verde Valley and greater geographic region the Project would be located. This analysis is provided to lend context to arguments presented above.

2. CEQA Thresholds of Significance:

As shown, the visual impact significance criteria in the CEC's Method provide an insufficient metric to gauge comparative levels of impact significance. With this in mind, we explore the context of several of the impact statements made in the PSA.

Visual Character and Visual Quality

The PSA identifies Bradshaw Trail, views within the Mule Mountain LTVA, and Palo Verde Mountain Wilderness Area as Scenic Vistas that have the potential to experience significant visual impacts as a result of the Project. The following discussion presents a circumstantial analysis of these features that is intended to provide greater perspective.

Bradshaw Trail: See discussion of impacts to Bradshaw Trail under Scenic Resources.

Mule Mountain LTVA: The Mule Mountain Long Term Visitor Area (LTVA) is located roughly 4 miles west of the Project. As seen in the photos below, the western slope of Mule Mountains are a prominent form within this visual landscape. Table 1 below presents a sample of easterly views from within the Mule Mountain LTVA. This collection of views demonstrates that vegetation, from certain unpredictable locations, can have the effect of screening the Mule Mountains and therefore potential views toward the Project. As such, it makes sense to also surmise that viewers within the LTVA would not experience one static view toward the Project, but instead would (for the most part) be interacting with the nuances of the landscape in their immediate foreground. While distant and panoramic views would make up part of a typical users experience, it would be difficult to determine if the Project in fact would dominate the viewers collective experience within the LTVA.

¹ An assumption is defined as: a fact or statement (as a proposition, axiom, postulate, or notion) taken for granted, (<http://www.merriam-webster.com/dictionary/assumption>, accessed October 6, 2012).

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In addition to the consideration of collective experience, we also recognize that views from the LTVA already show a landscape that is culturally modified. Structures such as transmission lines, fences, the Chuckwalla/Ironwood State Prison, and Wiley's Well Road are visible from certain areas within the LTVA. Additionally, I-10 is located approximately 10-miles north of the LTVA.

Each of these factors should be an important consideration in the visual impact assessment.

Palo Verde Mountain Wilderness: Page 4.13-11, 3rd Paragraph, 3rd Sentence: The PSA states, "While not the sole criterion for designation of wilderness areas, preservation of scenic values is a key concern underlying the Wilderness Act (P.L. 88-577(16 U.S.C. 1131-1136))."

We agree with this statement insofar as views toward, and not from, a designated Wilderness Area are intended to be preserved by the Wilderness Act. To say that development surrounding a Wilderness Area is subject to the developmental restrictions of the Wilderness Act would overstep the regulatory authority of this Act. In this regard, we concur with Staff's statement that viewers (such as hikers and other recreationists) from the Palo Verde Mountain Wilderness are assumed to be highly sensitivity to adverse visual changes within the boundaries of the Wilderness Area. We also submit that greater effort should be made to contextualize the scenic quality of views, and the percent of acreage the Palo Verde Mountain Wilderness Area represents within the greater Basin and Range Physiographic Province.

Scenic Quality of Views from the Palo Verde Mountain Wilderness: Similar to the Mule Mountain LTVA, hikers utilizing the Palo Verde Mountain Wilderness would experience different views at different elevations and points within the Palo Verde Mountain Wilderness. From elevated positions that offer unobstructed views of the Palo Verde Valley, hikers currently look out over a culturally modified and mosaic landscape that has been altered from its natural state. This degree of cultural modification and anthropogenic influence stems from decades of agricultural use, the presence of roads, irrigation canals, numerous power lines, and the construction of residences within Palo Verde, Ripley and Blythe. Furthermore, it is likely that open and panoramic views of the Palo Verde Valley from within the Palo Verde Mountain Wilderness comprise a relatively small proportion of the total available views a typical hiker would experience while in the Wilderness Area.

URS field reconnaissance at Clapp Spring (within the Palo Verde Wilderness Area) suggests that the majority of views from this trail would be obstructed by topographic changes in the land. Meaning, most views within the Wilderness Area would be of intersecting ridgelines, rock outcrops, scrubby vegetation, and other natural features in the fore to midground area of a particular view; and as such would block distant views of the Palo Verde Valley and Palo Verde Mesa. In this respect, we contend it is difficult to unequivocally assume that the Project would represent a significant visual impact to the Palo Verde Mountain Wilderness. Rather, we submit that while the Palo Verde Mountain Wilderness may have highly sensitive viewers, the value of the Wilderness as it was intended under the Congressional designation (see purpose and definition of Wilderness Areas as created by Congress below) remains unaltered despite the addition of the Project.

Purpose of Wilderness Areas:

..."For this purpose there is hereby established a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as "wilderness areas", and these shall

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be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness; and no Federal lands shall be designated as "wilderness areas" except as provided for in this Act or by a subsequent Act," (Public Law 88-577 (16 U.S. C. 1131-1136), Section 2(a)).

Definition of Wilderness Areas:

"A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value," (Public Law 88-577 (16 U.S. C. 1131-1136), Section 2(c)).

Based on the definition of a Wilderness Area, and in consideration of its purpose and intent, we submit that the intent of the Palo Verde Wilderness Area would remain functionally intact with the addition of the Project. Most visitors who interact with this landscape will be traveling on trails, which for the most part are located in valley areas of the mountainous landscape. As such, the capacity for the Wilderness Area to offer visitors a remote, experience with this landscape will remain unaffected. And because panoramic and open views already present a landscape that is culturally modified, the case that the Project alone would detract from this Wilderness Area oversteps the purpose and intent of the Wilderness Act.

Palo Verde Mountain Wilderness Statistics: The Bureau of Land Management uses Physiographic Provinces as a basis for comparison of the scenic quality of a landscape. In this sense, a Physiographic Province enables an "apples to apples" comparison of similar landscapes. The Palo Verde Mountain Wilderness is located within the Basin and Range Physiographic Province. We have outlined several statistics for a comparative analysis of the Basin and Range Physiographic Region as it relates to the geographical extent of the Palo Verde Mountain Wilderness. Figures 1 and 2 below provide visual aid for this analysis.

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Figure 1: Geographical Extent of Basin and Range Physiographic Region



Figure 2: Wilderness Areas Within 10 and 30 Miles of Project Power Towers.



Table 2

Basin and Range Physiographic Province Wilderness Areas		
Basin and Range Physiographic Province	222,244,560 acres	
Number of Wilderness Areas within Basin and Range Physiographic Province	390	
Total Acreage of Wilderness Areas within the Basin and Range Physiographic Province	17,169,920 or 7% of total area of Physiographic Province	
Wilderness Areas within 10 miles of Project power towers	Palo Verde Mountain Wilderness	
Acreage of Palo Verde Mountain Wilderness	30,562 acres	0.013% of the total land area of the Basin and Range

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Table 2

Basin and Range Physiographic Province Wilderness Areas		
		Physiographic Province
		0.17% of the total land area of all Wilderness Areas within the Basin and Range Physiographic Province.
Wilderness Areas within 30 miles of the Project power towers	<ol style="list-style-type: none"> 1. Palen/McCoy Wilderness 2. Rice Valley Wilderness 3. Big Maria Mountains Wilderness 4. Chuckwalla Mountains Wilderness 5. Little Chuckwalla Mountains Wilderness 6. Palo Verde Mountain Wilderness 7. Trigo Mountain Wilderness 8. Imperial Refuge Wilderness 9. Indian Pass Wilderness 10. Picacho Peak Wilderness 	
Acreage of Wilderness Areas within 30 miles of the Project power towers	551,680 acres	0.24% of total land area in Basin and Range Physiographic Province
		3.1% of total land area of all Wilderness Areas in the Basin and Range Physiographic Province.
Source: www.wilderness.net , accessed October 6, 2012.		

Cibola National Wildlife Refuge: The CEC’s method specifically states that: the measure of Visual Change, which the Visual Quality and Visual Character CEQA, Appendix G Threshold relies upon, determines the amount of visual change based on: CONTRAST, DOMINANCE, and VIEW DISRUPTION. “Generally, contrast and dominance contribute more to the degree of visual change than does view disruption.” In this sense, the method does not accurately account of the day to day features that will occupy a viewer’s view at any given time.

Staff measures of Visual Sensitivity at Cibola NWR are consistent with the applicant’s analysis. However, we suggest the analysis give more consideration to blockages that occur throughout the refuge (i.e., flood berms, dense vegetation, etc.). While certain parts of the refuge, (i.e., the campsite the PSA

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references) will have unobstructed views of the Project, the majority of views within the refuge will be screened. Additionally, it could also be argued that the majority of visitors who recreate within the refuge will be drawn to easterly views of the Saw Tooth Mountains in Arizona rather than westerly views toward the Mule Mountains. It could be argued that these mountains present a more interesting form which would serve to draw the viewers eye in a direction opposite the Project.

Scenic Resources:

Staff notes the Project would adjoin the easternmost portions of the Bradshaw Trail. Staff also notes the entire Bradshaw Trail is considered a “scenic vista.” We contend that emphasis should be placed on the comparatively small proportion of Bradshaw Trail that would be affected by the Project. In other words, according to Staff Figure 4 in the PSA, the Rio Mesa Viewshed Model suggests that the Project will be visible for approximately 12 miles of Bradshaw Trail. We submit that Bradshaw Trail is in fact a 65-mile long trail. If the Project is visible for only 12-miles, this represents 18% of the total length of Bradshaw Trail. For proportional purposes, if motorists were consistently traveling at a rate of 35 mph on Bradshaw Trail (from end to end), it would take them roughly two hours to travel the length of the trail. As such, the Project would be visible for 20 minutes of this total duration.

Additionally, it should be noted that the existing easterly views from the Bradshaw Trail as a motorist travels eastbound on Bradshaw Trail and begins to descend into the Palo Verde Valley from the Mule Mountains, existing views present a culturally modified landscape. As described in panoramic views from Clapp Spring, views from the elevated portions of Bradshaw Trail would look out over a culturally modified and anthropogenic ally influenced landscape. In this sense, the existing visual character would enable the Project to better harmonize than if the landscape were completely undeveloped. Meaning, because the landscape has already been altered, the addition of the Project would have a proportionally smaller degree of impact than if it were undeveloped.

Visual Character and Visual Quality

In each of the findings for viewer sensitivity, we suggest adding a caveat to the impact determination to recognize the relative limited amount of exposure (as a factor of population) the Project would receive when compared to other population centers within Riverside County, and as a factor of the combined population of Riverside and Imperial Counties. This factor speaks to the flaw in the analytical method which does not provide a threshold to measure at what level of exposure (as a measure of population) an impact finding becomes significant.

The following analysis provides additional context for each of the KOPs discussed in the PSA. Staff divides the landscape into four Landscape Units from which the visual sensitivity and visual change is analyzed. These areas include:

- a. Palo Verde Valley KOPs
- b. I-10 Corridor KOPs
- c. BLM Lands
- d. Cibola NWR
- e. Mule Mountain ACEC

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The analysis below provides comparative population references for the Palo Verde Valley and surrounding communities in relation to cities within the Coachella Valley Region of Riverside County, and the Inland Empire Region, of Riverside County).

Palo Verde Valley KOPs and Population:

It is important to view the context of the population that surrounds the Project within the Palo Verde Valley and greater Riverside and Imperial Counties. As such the information below is presented for context.

Table 3

Population	Distance to Project Power Towers
328	8 miles
21,217	20 miles
Source: US Census, 2010. URS, 2012.	

Table 4

Municipal or County Population Center	Population Total (US Census, 2010)	Represented as Percent of Pop (328 people) within 8 miles of the Project	Represented as a Percent of the Population (21,217) within 20 miles of the Project
Blythe	20,817	1.57%	101.9%
Coachella	40,704	0.80%	52.12%
Palm Desert	48,445	0.67%	43.79%
Palm Springs	44,552	0.73%	47.62%
Riverside	308,511	0.10%	6.8%
Riverside County	2,189,641	0.014%	0.96%
Imperial County	174,528	0.18%	12.15%
Riverside and Imperial Combined:	2,364,169	0.013%	0.89%
Source: US Census, 2010. URS, 2012.			

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Figure 3 – Several Major Population Centers in Relation to Project Power Towers



The PSA identifies sensitive viewers within the Palo Verde Valley as residents in around Palo Verde and Ripley and motorists on SR-78.

Interstate-10:

The PSA identifies sensitive viewers from I-10 as residents of Mesa Verde, Blyth Airport, and travelers on I-10. The analysis of Visual Sensitivity and Visual Change describes the level of visual resource change from residences of Mesa Verde interchangeably with views from motorists on I-10. We contend the PSA should better separate the analysis as it serves to confuse the overall significance determination.

Page 4.13-12, 5th Paragraph, Third Sentence: “Average daily traffic numbers in this segment of I-10 are high: 22,500 (westbound) and 23,800 (eastbound). Westbound motorists would be exposed to views of the solar towers from the state line and beyond, approximately 15 miles. This represents a view duration of roughly 15 minutes at 50 miles per hour, a relatively long period of exposure for motorists.”

The statement that the view from I-10 would represent a long period of exposure for motorists appears to be somewhat subjective. The Traffic and Transportation section of the PSA states, **Page 4.11-6, 4rd Paragraph, Second Sentence:** “In the project area, I-10 has two lanes in each direction and a speed limit of 70 miles per hour. Trucks comprise approximately 39 percent of the traffic in the project area.”

If the total ADT heading eastbound on I-10 is 39% truck traffic, this means that approximately 9,282 of those viewers will be from non-truck traffic. We contend this is a proportionally small percentage exposure when the true nature of the primary user is explored.

If the total ADT heading westbound on I-10 is 39% truck traffic, this means that approximately 8,775 of these viewers will be non-truck traffic. We contend this is a proportionally small percentage of the total exposure.

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Additionally, it is unclear how the PSA determines how the length of time exposed to the Project can be considered a “long period of exposure.” What metric is used to determine whether this length is long, moderate, or short-term. We submit that I-10 travels roughly 1,200 miles through the Basin and Range Physiographic Province. If the Project were visible for 30 miles along I-10, this would represent 2.5% of the total area of I-10 within that Province. Using measures of exposure from the PSA, if the Project were visible for 15 miles, this would represent 1.2% of the total area of I-10 located within the Basin and Range Physiographic Province.

BLM Lands (Palo Verde Mesa, Mule Mountains)

See discussion of Sensitive Resources above.

Cibola NWR/Colorado River

See discussion under Sensitive Resources above.

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WASTE MANAGEMENT

GENERAL COMMENTS

No general comments.

FINDINGS OF FACT

No findings of fact listed are listed in the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

1. **Page 4.14-19, WASTE-1:** Please revise the verification of Waste-1 as follows:

Verification: The project owner shall submit the UXO Identification, Training and Reporting Plan to the CEC staff ~~CPM~~ for approval no less than 60 days prior to ~~the initiation~~ implementation of the Plan of construction activities at the site. The results of the geophysical surveys shall be submitted to the CPM or CEC staff within 30 days of completion of the surveys.

2. **Page 4.14-20, WASTE-4:** Applicant recommends deletion of the reference to AB 341 as part of the condition language as it duplicates language in the analysis and is also addressed in the verification language. Please revise as follows:

WASTE-4 The project owner shall prepare a Construction Waste Management Plan for all wastes generated during construction of the facility, in accordance with Title 24, Part 11, and shall submit the plan to the CPM for review and approval. The plan shall contain, at a minimum, the following:

- A description of all construction waste streams, including projections of frequency, amounts generated, and hazard classifications.
- Management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans.
- Method for collecting weigh tickets or other methods for verifying the volume of transported and or location of waste disposal.

WASTE MANAGEMENT

~~AB 341 (Chesbro) requires a business, defined to include a commercial or public entity, which generates more than four cubic yards to recycle 50% of construction waste.~~

Verification: The project owner shall submit the Construction Waste Management Plan to Riverside County for review, and to the CPM for review and approval no less than 30 days prior to the initiation of construction activities at the site. The project owner shall submit to the County demonstration that they met the construction and demolition waste diversion requirements of 50 percent diversion pursuant to the CalGreen Building codes.

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WORKER SAFETY AND FIRE PROTECTION

GENERAL COMMENTS

1. The Executive Summary contained in Part B of the PSA included additional language for Worker Safety and Fire Protection that was not originally provided in the Worker Safety and Fire Protection section included in Part A of the PSA. Applicant recommends the deletion of Worker Safety 9 as addressed within the Executive Summary for the following reasons:
 - The County vehicle for compensation for impacts on County Services including fire facilities is Ordinance 659 (which I have attached). Please see pages 6 and 7 for the fees in the specific area for RMS.
 - Within the Land Use Section of the PSA, CEC Staff incorrectly determined the Ordinance 659 fee in the Land Use Section to be ~\$25 million. This large figure understandably caused the Staff concern. Please be aware that Riverside County assesses the areas of impact from Utility Scale Solar projects as “Occupied” and “Industrial”, and they are defined as follows¹.
 - “Occupied” is everything within the fenceline
 - “Industrial” includes paved roads, power blocks, inverters, substations, and O&M Buildings; it does not include solar arrays, roads through the arrays for access and cleaning, ponds, settling basins or the like
 - Riverside County Planning Department determines the DIF for solar power plants based on the “Industrial” component as defined by the County¹. Using the County’s approved methodology, the total impact acreage for fee calculation for RMS would be approximately 87 acres, which is a small subset of the 3,805 acres.
2. Because the County has an Ordinance that is specifically designed to compensate it for impacts to County Services including Fire Facilities, and BrightSource has prepared a Fire Facilities impact assessment with a third party contractor already in response to a CEC Data Request, there is no reason for another Fire Needs Assessment Study to be performed.

For the reasons described above, Applicant sees no valid reason to hold up publication of the FSA with respect to determination of impacts to or compensation for fire and emergency service facilities. Applicant requests removal of this provision as discussed further in Specific Comment #1.

¹ Per John Snell on October 16, 2012, who spoke with the Riverside County Planning Director and confirmed this is the correct interpretation of the application of Ordinance 659 with respect to utility scale solar facilities.

WORKER SAFETY AND FIRE PROTECTION

FINDINGS OF FACT

No findings of fact listed in this section of the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

1. **Page 4.15-27, WORKER SAFETY-1:** Eyesight protection will be addressed in the Personal Protective Equipment Program as identified in the Construction Safety and Health Program. The Personal Protective Equipment Program will ensure that workers in the solar field receive and wear appropriate protective sunglasses. The Personal Protective Equipment Program will establish the requirements and procedures for the use of protective eye protection equipment and will provide training and, monitoring of worker use of the PPE and compliance with worker safety procedures. Please revise as follows:

WORKER SAFETY-1 The project owner shall submit to the compliance project manager (CPM) a copy of the Project Construction Safety and Health Program containing the following:

- a Construction Personal Protective Equipment Program;
- a Construction Exposure Monitoring Program;
- a Construction Injury and Illness Prevention Program;
- a Construction Heat Stress Protection Plan that implements and expands on existing Cal OSHA regulations as found in 8 CCR 3395;
- a Construction Emergency Action Plan;
- a Construction Fire Prevention Plan that includes the above-ground fuel depot; and
- ~~an Eyesight Protection from Retinal Damage Plan that is designed to insure that workers in the solar field receive and wear the appropriate protective sunglasses. This Eyesight Protection from Retinal Damage Plan would:~~
 - (1) ~~identify and acquire the appropriate eye protection (EP) equipment based on the IEC 62471 standards in sufficient numbers to provide safety glasses for the workers engaged in solar field work, and tower work where the potential exists for heliostat solar reflective exposure or SRSR exposure during operations,~~
 - (2) ~~establish the requirements and procedures for the donning and doffing of the EP by workers and provide training and,~~
 - (3) ~~monitor worker use of the PPE and compliance with the EP procedures.~~

Verification: The Personal Protective Equipment Program, the Exposure Monitoring Program, the Injury and Illness Prevention Program, the Heat Stress Protection Plan, and the Eyesight Protection from Retinal Damage Plan shall be submitted to the CPM for review and approval to document compliance of the program with all applicable safety orders. The Construction Emergency Action Plan and the Fire Prevention Plan shall be submitted to the Riverside County Fire Department for review and comment within 2 weeks of receipt, prior to submittal to the CPM for approval.

WORKER SAFETY AND FIRE PROTECTION

2. **Page 4.15-28, WORKER SAFETY-2:** Eyesight protection will be addressed in the Personal Protective Equipment Program as identified in the Operations and Maintenance Safety and Health Program. The Personal Protective Equipment Program will ensure that workers in the solar field receive and wear appropriate protective sunglasses. The Personal Protective Equipment Program will establish the requirements and procedures for the use of protective eye protection equipment and will provide training and, monitoring of worker use of the PPE and compliance with worker safety procedures. Please revise Worker Safety-2 as follows:

WORKER SAFETY-2 The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- an Operation Injury and Illness Prevention Plan;
- an Operation Heat Stress Protection Plan that implements and expands on existing Cal OSHA regulations (Cal. Code of Regs., tit. 8, § 3395);
- a Best Management Practices (BMP) for the storage and application of herbicides and pesticides;
- an Emergency Action Plan;
- Hazardous Materials Management Program;
- Fire Prevention Plan that includes the fuel depot should the project owner elect to maintain and operate the fuel depot during operations (8 Cal Code Regs. § 3221);
- Personal Protective Equipment Program (Cal Code Regs., tit. 8, §§ 3401—3411); and
- ~~• an Eyesight Protection from Retinal Damage Plan that is designed to insure that workers in the solar field receive and wear the appropriate protective sunglasses. This Eyesight Protection from Retinal Damage Plan would:~~

~~(1) — identify and acquire the appropriate eye protection (EP) equipment based on the IEC 62471 standards in sufficient numbers to provide safety glasses for the workers engaged in solar field work, and tower work where the potential exists for heliostat solar reflective exposure or SRSR exposure during operations,~~

~~(2) — establish the requirements and procedures for the donning and doffing of the EP by workers and provide training and,~~

~~(3) — monitor worker use of the PPE and compliance with the EP procedures.~~

Verification: The Operation Injury and Illness Prevention Plan, Heat Stress Protection Plan, BMP for Herbicides, and Personal Protective Equipment Program, and the Eyesight Protection from Retinal Damage Plan shall be submitted to the CPM for review and comment concerning compliance of the programs with all applicable safety orders. The Fire Prevention Plan and the Emergency Action Plan shall also be submitted to the Riverside County Fire Department for review and comment within 2 weeks after receipt.

3. **Page 4.15-31, WORKER SAFETY-6:** Please revise this condition as follows:

WORKER SAFETY-6 The project owner shall provide a second access gate if required at the time of development by the Riverside County Fire Department for emergency

WORKER SAFETY AND FIRE PROTECTION

personnel to enter the site . ~~This secondary access gate shall be at least one quarter mile from the main gate.~~

Plans for the secondary access gate and the method of gate operation shall be submitted to the Riverside County Fire Department for review and comment and to the CPM for review and approval.

Verification: At least sixty (60) days prior to the start of site mobilization, the project owner shall submit to the Riverside County Fire Department for review and comment within 2 weeks after receipt and to the CPM for review and approval preliminary plans showing the location of a second access gate to the site, if required, and a description of how the gate will be opened by the fire department. The final plan submittal shall also include a letter containing comments from the Riverside County Fire Department or a statement that no comments were received.

4. **Page 4.15-31, WORKER SAFETY-7:** The dust (PM10) control measures found in the Air Quality section of this PSA should be strictly adhered to in order to adequately reduce the risk of contracting Valley Fever to a less than significant level. Dust control for the project as required, will be addressed in **AQ-SC3**, and is not a part of the Worker Safety Program. The use of dust masks will be addressed in the Personal Protective Equipment Programs as identified in the Construction Safety and Health Program and the Operations and Maintenance Health and Safety Program. The Personal Protective Equipment Programs will ensure that workers receive and wear appropriate dust masks during earthmoving activities. The Personal Protective Equipment Program will establish the requirements and procedures for the use of dust masks and will provide training and, monitoring of worker use of the PPE and compliance with worker safety procedures. For these reasons, WORKER SAFETY-7 should be deleted in its entirety:

~~**WORKER SAFETY 7** The project owner shall develop and implement an enhanced Dust Control Plan that includes the requirements described in **AQ-SC3** and additionally requires:~~

- ~~a) site worker use of dust masks (NIOSH N 95 or better) whenever visible dust is present;~~
- ~~b) implementation of methods equivalent to Rule 402 of the Kern County Air Pollution Control District (as amended Nov. 3, 2004); and~~
- ~~c) implementation of enhanced dust control methods (increased frequency of watering, use of dust suppression chemicals, etc. consistent with **AQ-SC4**) immediately whenever visible dust comes from or onto the site or when PM10 measurements obtained when implementing b) (above) exceed 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$).~~

~~**Verification:** At least 60 days prior to the commencement of site mobilization, the enhanced Dust Control Plan shall be provided to the CPM for review and approval.~~

5. **Page 4.15-31, WORKER SAFETY-8:** Please revise as follows

WORKER SAFETY-8 The project owner shall comply with NFPA 56(PS) and not allow any fuel gas pipe cleaning activities on site, either before placing the pipe into service or at any time during the lifetime of the facility, that involve “flammable gas blows” where

WORKER SAFETY AND FIRE PROTECTION

natural (or flammable) gas is used to blow out debris from piping and then vented to atmosphere. Instead, an inherently safer method involving a non-flammable gas (e.g. air, nitrogen, steam) or mechanical pigging shall be used. Pursuant to NFPA 56(PS), exceptions to this provision may be allowed only if no other satisfactory method is available, and then only with the approval of the CPM.

Verification: At least 30 days before any fuel gas pipe cleaning activities are conducted onsite involving fuel gas pipe of four-inch or greater external diameter, the project owner shall submit a copy of ~~a~~ the Fuel Gas Pipe Cleaning Work Plan which shall indicate the method of cleaning to be used, what gas will be used, the source of pressurization, and whether a mechanical PIG will be used, to the CBO for information and to the CPM for review and approval.

6. **Page 4.15-31, WORKER SAFETY-9:** Refer to Specific Comment #1 regarding Riverside Board Policy B-29 and County Ordinance No. 659. Please delete Worker Safety-9 in its entirety. As recommended in that comment, WORKER SAFETY-9 should be deleted in its entirety.

~~**WORKER SAFETY 9** In the event that Riverside County Solar Policy B-29 is overturned, the project owner shall either:~~

~~(1) Reach an agreement with the Riverside County Fire Department (RCFD) regarding funding of its project related share of capital and operating costs to improve fire protection/emergency response infrastructure and provide appropriate equipment as mitigation of project related impacts on fire protection/emergency response services within the jurisdiction; **or**~~

~~(2) If no agreement can be reached, the project owner shall fund a study (the "independent fire needs assessment and risk assessment") conducted by an independent contractor who shall be selected by the project owner and approved by the Energy Commission compliance project manager (CPM), in consultation with Riverside County Fire Department, and fulfill all mitigation identified in the independent fire needs assessment and a risk assessment. The study shall evaluate the project's proportionate funding responsibility for the above identified mitigation measures, with particular attention to emergency response and equipment/staffing/location needs.~~

~~Should the project owner pursue option (2), above, the study shall evaluate the following:~~

~~(a) the project's proportionate (incremental) contribution to potential cumulative impacts on the RCFD and the project allocated costs of enhanced fire protection/emergency response services including the fire response, hazardous materials spill/leak response, rescue, and emergency medical services necessary to mitigate such impacts;~~

~~(b) the extent that the project's contribution to local tax revenue will reduce impacts on local fire protection and emergency response services; and~~

~~(c) recommend an amount of funding (and corresponding payment plan) that represents the project's proportional payment obligation for the above identified mitigation measures.~~

WORKER SAFETY AND FIRE PROTECTION

Compliance Protocols shall be as follows:

~~(a) the study shall be conducted by an independent consultant selected by the project owner and approved by the CPM. The project owner shall provide the CPM with the names of at least three consultants, whether entities or individuals, from which to make a selection, together with statements of qualifications;~~

~~(b) the study shall be fully funded by the project owner.~~

~~(c) the project owner shall provide the protocols for conducting the independent study for review and comment by the RCFD and review and approval by the CPM prior to the independent consultant's commencement of the study;~~

~~(d) the consultant shall not communicate directly with the project owner or RCFD without express prior authorization from the CPM. When such approval is given, the CPM shall be copied on any correspondence between or among the project owner, RCFD, and the consultant (including emails) and included in any conversations between or among the project owner, RCFD and consultant; and~~

~~(e) the CPM shall verify that the study is prepared consistent with the approved protocols, or~~

~~(3) If the project owner and RCFD do not agree to the recommendations of the independent consultant's study, the Energy Commission or its designee shall, based on the results of the study and comments from the project owner and RCFD, make the final determination regarding the funding to be provided to the RCFD to accomplish the above-identified mitigation.~~

~~No construction shall occur until funding of mitigation occurs pursuant to either of the resolution options set forth above.~~

Verification: At least five (5) days before start of construction, the project owner shall provide to the CPM:

~~(1) A copy of the individual agreement with the RCFD; and evidence in each January Monthly Compliance Report that the project owner is in full compliance with the terms of such agreement; or~~

~~(2) A protocol, scope and schedule of work for the independent study and the qualifications of proposed contractor(s) for review and approval by the CPM; a copy of the completed study showing the precise amount the project owner shall pay for mitigation; and documentation that the amount has been paid.~~

~~Annually thereafter, the owner shall provide the CPM with verification of funding to the RCFD if annual payments were approved or recommended under either of the above-described funding resolution options.~~

7. **Page 4.15-31, WORKER SAFETY-10:** Refer to Specific Comment #1 regarding Riverside Board Policy B-29 and County Ordinance No. 659. Please delete Worker Safety-10 in its entirety.

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~~**WORKER SAFETY 10**~~ In the event that Riverside County Solar Policy B-29 is overturned, the project owner shall:

Provide a \$200,000 payment to Riverside County Fire Department prior to the start of construction. This funding shall off set any initial funding required by ~~**WORKER SAFETY 9**~~ above until the funds are exhausted. This offset will be based on a full accounting by the Riverside County Fire Department regarding the use of these funds.

~~**Verification:**~~ At least five (5) days prior to the start of construction the project owner shall provide documentation of the payment described above to the CPM. The CPM shall adjust the payments initially required by ~~**WORKER SAFETY 9**~~ based upon the accounting provided by the Riverside County Fire Department.

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FACILITY DESIGN

GENERAL COMMENTS

1. Strike multiple places where stating “if the initial designs are submitted to the chief building official (CBO) for review and approval after the update to the 2010 CBSC takes effect, the 2010 CBSC provisions shall be replaced with the updated provisions” (or similar). State that Rio Mesa SEGF will be designed and constructed to the 2010 CBSC only.

FINDINGS OF FACT

No findings of fact listed are listed in the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

1. **Page 5.1-19, ELEC-1:** Please revise the condition as follows:

ELEC-1 Prior to the start of any increment of electrical construction for all electrical equipment and systems ~~110~~ 480 Volts or higher (see a representative list, below) the project owner shall submit, for CBO design review and approval, the proposed final design, specifications, and calculations. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in conditions of certification in the **Transmission System Engineering** section of this document.

- A. Final plant design plans shall include:
 1. one-line diagram for the ~~13.8 kV~~, 4.16 kV and 480 V systems;
 2. system grounding drawings;
 3. lightning protection system; and
 4. hazard area classification plan
- B. Final plant calculations must establish:
 1. short-circuit ratings of plant equipment;
 2. ampacity of feeder cables;
 3. voltage drop in feeder cables;
 4. system grounding requirements;
 5. coordination study calculations for fuses, circuit breakers and protective relay settings for the ~~13.8 kV~~, 4.16 kV and 480 V systems;

FACILITY DESIGN

6. system grounding requirements;
 7. lighting energy calculations; and
 8. 110/208/277/480 volt lighting system design ~~calculations~~ and submittals showing ~~feeder sizing, transformer and~~ panel schedule with load and transformer information ~~load confirmation, fixture schedules~~ and lighting layout plans with fixture details
- C. The following activities shall be reported to the CPM in the monthly compliance report:
1. Receipt or delay of major electrical equipment;
 2. Testing or energization of major electrical equipment; and
 3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission decision.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above listed documents. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

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GEOLOGY & PALEONTOLOGY

GENERAL COMMENTS

1. CEC has requested information on two additional geologic formations; Applicant will not be able to provide the information until after December 3, 2012 because the dating process for these two additional formations requires at least three months to process. This supplemental paleontological information is not necessary to form impact conclusions for either the PSA or FSA as agreed to by Staff based on an email communication received on September 17, 2012.
2. The PSA appears to conflate the Society of Vertebrate Paleontology's definition of "significant paleontological resources" with CEQA's mandate that the CEC identify potentially significant environmental impacts and feasible mitigation measures. The PSA must be revised to more accurately reflect CEQA requirements.
3. While the Society of Vertebrate Paleontology (SVP) provides advisory guidance regarding potentially significant paleontological resources, the CEC has not appropriately used this guidance to develop a legally sufficient threshold of significance pursuant to CEQA. The PSA states that "a vertebrate fossil is considered scientifically important unless otherwise demonstrated," and suggests that a single fossil impact would be significant under CEQA. As discussed below, any such implication would not conform to CEQA. Other lead agencies that have incorporated SVP guidance recovery also explicitly recognize that 100% recovery of all fossils, including fossils that may be considered "scientifically significant" by the SVP, is not feasible, reasonable, and not required to support a less than significant finding relative to potential paleontological impacts.
 - a. CEQA requires that an EIR must describe feasible mitigation measures that can minimize a project's *significant* environmental effects. 14 Cal. Code Regs. §§ 15121(a), 15126.4(a). Mitigation is not required for insignificant environmental impacts. Pub. Res. Code §§ 21100(b)(3), 21150; 14 Cal. Code Regs. § 15126.4(a)(3).
 - b. Mitigation measures must be "feasible," meaning the measure must be capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors. Pub. Res. Code § 21061.1. Mitigation measures are not required to avoid an impact entirely, but instead may limit the scope or magnitude of a proposed activity. 14 Cal. Code Regs. § 15370(b).
 - c. Under CEQA, "[a] less than significant impact does not necessarily mean no impact at all." *Oakland Heritage Alliance v. City of Oakland* (2011) 195 Cal.App.4th 884, 899. CEQA's standards "allow for a finding of an insignificant degree of impact, not necessarily a zero impact." *National Parks & Conserv. Ass'n v County of Riverside* (1999) 71 Cal.App.4th 1341, 1359.
4. Consistent with CEQA and the federal National Environmental Policy Act (NEPA), lead agencies that utilize or incorporate the SVP guidance have also concluded that a finding of less than significant impacts or effects to paleontological resources does not require the complete

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avoidance or recovery of vertebrate or other "scientifically significant" fossils. In each of these instances, the impact analysis explicitly considers practicality, economic factors, and the extent to which a reasonable, representative sample of such resources can be obtained. The PSA must be revised to include the additional context, such as feasibility, practicability, cost, and related factors, that must be included in a legally defensible CEQA threshold and that are consistent with the precedents cited below.

- a. In June 2012, Caltrans released a Draft Environmental Impact Report/Environmental Impact Statement for the I-710 Corridor (Long Beach Freeway) Project in Los Angeles County available at <http://www.dot.ca.gov/dist07/resources/envdocs/docs/710corridor/>. The I-710 Project Area includes sediments from the Holocene and Pleistocene eras. See, e.g., I-710 Draft EIR/EIS at p. 3.11-2. The I-710 Draft EIR/EIS concludes that "[e]arthmoving operations could result in the destruction of fossils and fossiliferous rock units within the construction disturbance limits. It is often not possible to completely eliminate impacts to fossil resources. It is understood that earthmoving activity could, unavoidably, destroy some fossils. These types of impacts can be mitigated by collecting and preserving a representative sample of the entire fossil assemblage and associated geological information in the areas disturbed by project construction." *Id.* at 3.11-6. Applying this standard, which contemplated that certain fossils would be unavoidably impacted by the project, the DEIR concluded that impacts to paleontological resources would nevertheless be less than significant with the recovery of a representative sample, but not all potentially affected fossils in the project area.
- b. The Bureau of Land Management (BLM) has published a detailed discussion of measures appropriate for protecting and mitigating for impacts to paleontological resources (BLM Manual H-8720-1, *General Procedural Guidance For Paleontological Resource Management*)(Manual 8720). The BLM is also the lead federal permitting agency for the project, and will issue permits for certain project elements and review the project's environmental impacts in accordance with NEPA requirements. Manual 8720 acknowledges that mitigation is required for impacts to vertebrate or other important fossils, but expressly provides that, even in the case of scientifically important fossil impacts, mitigation "may be accomplished...by obtaining representative samples of the fossils." Manual 8720 also does not require full monitoring of excavations and earth moving in fossil-bearing strata designated under the BLM's classification approach up to the level of "Class 4" soils, the most sensitive level identified within and adjacent to the project site. In these cases, Manual 8720 states that it may be more appropriate to "spot check" Class 4 or less sensitive strata in conjunction with a mitigation and monitoring program (Manual 8720-1, Sections III-3 through III-4). As a result, Manual 8720 does not require that sufficient paleontological impact mitigation must include the recovery of all potentially impacted, scientifically important fossils.
- c. BLM has also issued *Guidelines for Assessment and Mitigation of Potential Impacts to Paleontological Resources* (IM 2009-11), which state that "factors such as locality or specimen significance, economics, safety, and project urgency will be considered when developing mitigation measures." IM 2009-11 also indicates that the mitigation planner has discretion to recommend whether "total or partial recovery or sampling" is appropriate for a specific site (BLM IM 2009-11, 1-10 through 1-11). As a result, IM 2009-11 specifically recognizes that mitigation requirements for paleontological impacts must take account of

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practicality and feasibility factors and allows for mitigation approaches that may not include the recovery of all potentially impacted, scientifically important fossils.

- d. San Diego County adopted *Guidelines for Determining Significance of Paleontological Resources*, in 2007 and amended the guidelines in 2009. The San Diego County guidelines do not require paleontological-specific monitoring even in areas considered to have the highest potential for paleontological resources when the volume of soil disturbed is 2,500 cubic yards or less. In addition, the guidelines consider fossil finds of less than 12 inches to be consistent with a negative result (e.g., a report to the effect that “no fossils were found” would be issued even if sub-12-inch fossils were discovered) when smaller levels of earth movement occur in sensitive soils (San Diego County *Guidelines* pages 15-17). The San Diego guidelines, which were developed with technical support from the San Diego Museum of Natural History, do not require the recovery of all fossils from sensitive strata to avoid significant impacts to paleontological resources.
 - e. The San Bernardino County Development Code (Code) includes one of the most comprehensive paleontological protection requirements enacted by any local jurisdiction in California. The Code requires fossil monitoring and recovery when development occurs in high-potential or sensitive rock strata in a manner consistent with the SVP recommendations. Consistent with CEQA feasibility and practicability requirements, however, the extent the required paleontological mitigation is limited to specific levels of expense that vary with by type and size of the applicable project (Code § 82.20.030(f)). The San Bernardino County paleontological protection requirements specifically consider cost and feasibility and do not require the recovery of all fossils from sensitive strata to mitigate for project impacts.
 - f. The CEC has recently approved five solar energy projects, all of which involve boring or auguring to fix support structures potentially into strata that were determined to have high paleontological sensitivity. In each case, the final CEC certification concluded that project impacts to paleontological resources were less than significant with the incorporation of mitigation measures that were substantially similar to the proposed measures in the PSA (see, e.g., Rice Solar Energy (certification approved in 2010), Beacon Solar Energy (certification approved in 2010), Genesis Solar (certification approved in 2010), Palen Solar (certification approved in 2010), and Abengoa Mojave Solar (certification approved in 2010)). As discussed above with respect to the I-710 DEIR issued by Caltrans, these mitigation measures do not, and cannot ensure that impacts to each and every fossil in a project site are avoided. Notwithstanding this fact, none of the CEC certifications concluded that paleontological resource impacts would be significant.
 - g. Other lead agencies conducting CEQA review for renewable energy projects have also determined that potential impacts to formations with high paleontological sensitivity due to the insertion of supporting posts or piles would be mitigated to less than significant levels through monitoring programs consistent with the SVP and proposed PSA recommendations. These jurisdictions include Kern County (see, e.g., Antelope Valley Solar DEIR (2011), Catalina Renewable Energy Project DEIR (2011), and Beacon Photovoltaic Project (2012)), and Imperial County (Campo Verde Solar Project DEIR (2012)).
5. The PSA concludes that where conventional grading excavation is conducted, impacts to paleontological resources will be adequately mitigated by the proposed conditions of

GEOLOGY AND PALEONTOLOGY

certification and even yield a net gain to the science of paleontology. Eighty five percent of all project disturbances would yield this net gain. Staff is concerned that pylon insertion would not allow for recovery of fossil units. The PSA analysis should be revised to describe and consider the fact that impacts associated with pylon insertion will avoid approximately 99.8% of all sub-surface paleontological resources.

Total project disturbance is 641,281 cubic yards; pylon disturbance was calculated using 0.57^1 cubic yards per pylon x 170,000 pylons, which equals 96,900 cubic yards.

Unrecoverable pylon disturbance would be calculated by defining the volume of sensitive paleontological resources (paleosol) and the volume of pylon disturbances within that paleosol as calculated below. Conservatively assuming that the paleosol area is 7 feet thick on average and 799 acres across the project site, the volume within the fence line of the paleosol would be approximately 9,023,938 cubic yards. The volume of the pylon disturbance within the paleosol (0.57^1 cubic yards per pylon x 170,000 pylons x 21 percent of site underlain with paleosol²) is 20,349 cubic yards or approximately 0.2%.

Conservatively assuming the entire project site is underlain with paleosol to 7 feet (42,971,133 cubic yards), potential project impacts from the pylons is 96,900 cubic yards. Accordingly, the worst-case potential pylon disturbance is still only 0.2% of the potential paleosol resource.

There is no basis under CEQA for concluding that an impact of approximately 0.2% of the paleosol, almost complete avoidance of a resource, could possibly constitute a significant impact.

In the Specific Comments below, Applicant points out several examples, but not all instances, of changes conforming to this comment.

6. Revise the PSA to acknowledge that, in conjunction with the previous recovery of hundreds of surface fossils, Applicant will ensure that a representative sample of construction-related on-site fossils are also recovered as outlined in proposed Conditions of Certification **PAL-1** through **PAL-7**. Therefore, combined recovery already performed, full monitoring within the power block and common area disturbances, the avoidance of 99.8 percent of sensitive paleontological resources under the heliostat field render any impacts potentially associated with heliostat pylon insertion as less than significant.
7. Please replace "pedestal" or "pole" with the term "pylon". Also, please note that the pylons do not require installation of foundations, as they are vibrated directly into the ground.

FINDINGS OF FACT

No findings of fact listed are listed in this section.

¹ A 16" diameter boring to 11' deep per pylon.

² See Final Paleontological Resource Delineation Plan, page 3-1 where it references 21% of the project site is underlain with Qpv sediment.

PROPOSED CONDITIONS OF CERTIFICATION

1. **Pages 5.2-32 through 5.2-34, PAL-3:** Please move Verification to directly after the first paragraph. Please remove Numbers 1 and 2, as neither describes content of the PRMMP. If assurance is required (1), then that would take the form of a separate instrument. Identification of persons (2) is inappropriate for this sort of forward-looking plan. That happens later and is managed by the PRS. Please revise Item 9 as edited below. Negotiations with a repository cannot be concluded and an agreement cannot be put in place until after excavations are completed for the simple reason that such institutions need to know what they are to receive before they can agree to receipt.

PAL-3 The project owner shall ensure that the PRS prepares, and the project owner submits to the CPM for review and approval, a paleontological resources monitoring and mitigation plan (PRMMP) to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting, and sampling activities, and may be modified with CPM approval. This document shall be used as the basis of discussion when on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, and the CPM.

Verification: The PRMMP shall be developed in accordance with the guidelines of the Bureau of Land Management and the Society of Vertebrate Paleontology (SVP, 1995) and shall include, but not be limited, to the following:

- ~~1. assurance that the performance and sequence of project related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking, construction monitoring, mapping and data recovery, fossil preparation and collection, identification and inventory, preparation of final reports, and transmittal of materials for curation will be performed according to PRMMP procedures;~~
- ~~2. identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and the conditions of certification;~~
3. a thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;
4. an explanation of why, how, and how much sampling is expected to take place and in what units. To the extent that it is germane to the identified sensitive sediment, include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained units;
5. a discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed plan for monitoring and sampling;

GEOLOGY AND PALEONTOLOGY

6. a discussion of procedures to be followed in the event of a significant fossil discovery, halting construction, resuming construction, and how notifications will be performed;
7. a discussion of equipment and supplies necessary for collection of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
8. procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum that meets the Secretary of the Interior's and Society of Vertebrate Paleontology's standards and requirements for the curation of paleontological resources;
9. ~~Institutions that would be approached to curate~~ ~~identification of the institution that has agreed to receive~~ data and fossil materials collected, requirements or specifications for materials delivered for curation, and how they will be met, and the name and phone number of the contact person at the institution; and
10. a copy of the paleontological Conditions of Certification.

Verification: ——— At least 30 days prior to ground disturbance, the project owner shall provide a copy of the PRMMP to the CPM for review and approval. The PRMMP shall include an affidavit of authorship by the PRS, and acceptance of the PRMMP by the project owner evidenced by a signature.

4. **Pages 5.2-35 and 5.2-36, PAL-5:** Please move Verification to directly after the first paragraph and revise as follows:

PAL-5 The project owner shall ensure that the PRS and PRM(s) monitor consistent with the PRMMP all construction-related grading, excavation, trenching, and augering in areas where potential fossil-bearing materials have been identified, both at the site and along any constructed linear facilities associated with the project. In the event that the PRS determines full-time monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the project owner shall notify and seek the concurrence of the CPM.

Verification: The project owner shall ensure that the PRS and PRM(s) have the authority to ~~halt or~~ redirect construction around the immediate area of the find, if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

1. Any change of monitoring from the accepted schedule in the PRMMP shall be ~~provided~~ ~~proposed~~ in a letter or email from the PRS and the project owner to the CPM along with reasons for that change prior to the change in monitoring and will be included in the monthly compliance report. The letter or email shall include the justification for the change in monitoring and be submitted to the CPM for review and approval.

GEOLOGY AND PALEONTOLOGY

2. The project owner through the PRS shall ensure that the PRM(s) keep a daily monitoring log of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.
3. The project owner shall ensure that the PRS notifies the CPM within 24 hours of the occurrence of any incidents of recurring non-compliance with any paleontological resources conditions of certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.
4. For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM within 24 hours, or by Monday morning in the case of a weekend event where construction has been halted because of a paleontological find.

The project owner shall ensure that the PRS prepares a summary of monitoring and other paleontological activities placed in the monthly compliance reports. The summary shall include the name(s) of the PRS and PRM(s) active during the month, general descriptions of training and monitored construction activities, and general locations of excavations, grading, and other activities. A section of the report shall include the geologic units or subunits encountered, descriptions of samplings within each unit, and a list of identified fossils. A final section of the report shall address any issues or concerns about the project relating to paleontologic monitoring, including any incidents of non-compliance or any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the report shall include an explanation in the summary as to why monitoring was not conducted.

Verification: The project owner shall ensure that the PRS submits the summary of monitoring and paleontological activities in the MCR. When feasible, the CPM shall be notified 10 days in advance of any proposed changes in monitoring different from the plan identified in the PRMMP. If there is any unforeseen change in monitoring, the notice shall be given as soon as possible prior to implementation of the change.

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

**Applicant's General Comments and Comments to Conditions of Certification
on the Preliminary Staff Assessment**

POWER PLANT EFFICIENCY

GENERAL COMMENTS

No general comments.

FINDINGS OF FACT

No findings of fact listed in the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

No proposed Conditions of Certification are included in the PSA.

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

**Applicant's General Comments and Comments to Conditions of Certification
on the Preliminary Staff Assessment**

POWER PLANT RELIABILITY

GENERAL COMMENTS

No general comments.

FINDINGS OF FACT

No findings of fact listed in the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

No proposed Conditions of Certification are included in the PSA.

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

**Applicant's General Comments and Comments to Conditions of Certification
on the Preliminary Staff Assessment**

TRANSMISSION SYSTEM ENGINEERING

GENERAL COMMENTS

1. Under the current Queue Cluster process managed by the CAISO, it is infeasible to attempt to assess the downstream transmission system impact from a single generation project. Each Queue Cluster is comprised of multiple generators occasionally with multiple Interconnection Requests (IR), which foregoes the ability to assign a particular transmission system network upgrade cannot be to any one generator. Therefore, a conclusion that a particular network upgrade deployment is attributable to a specific generator under the “would not be constructed, but for” criteria cannot be made.

Network upgrades are evaluated by the CAISO and CPUC under the Queue Cluster process, based on public need and the reasonably foreseeable deployment of multiple generators, many of which are not under the jurisdiction of the CEC. Each proposed network upgrade is submitted to the California Public Utilities Commission (CPUC) through the Certificate of Public Convenience and Necessity (CPCN) process and undergoes an environmental review according to CEQA. The CPUC assesses the necessity of the proposed upgrade and develops the mitigation criteria as determined in the CEQA review for implementation by the participating Transmission System Owner (TSO) that is responsible for design and construction of the project. Assignment of costs to implement the project are based on formulae developed in the Phase I and Phase II studies prepared by the CAISO, or may in certain cases be fully upfront funded by the TSO. Within the Queue Cluster checks and balances as administered by the CPUC and the CAISO, the public interest is protected. Additional environmental review to determine mitigation based on a single generation project is unnecessary; however, a review to assess overall cumulative impacts in order to create a complete environmental record remains appropriate.

2. The PSA states that the Phase II Study for the California Independent System Operator (“CAISO”) Queue Cluster 3/Queue Cluster 4 “is required for staff to determine the potential need for downstream transmission facilities.” (PSA Page 5.5-1, First Paragraph). While the Phase II study would be useful, it is not required because the Phase I study is available. The Phase I study presents sufficient information to develop a conservative estimate of network upgrades required by the Rio Mesa SEGF and other projects in Queue Clusters 3 and 4. As noted in Section 6.1.4.1 of the CAISO Business Practice Manual (“BPM”) for Generator Interconnection:

The “Phase I Interconnection Study shall (i) evaluate the impact of *all* interconnection Requests received during the applicable Cluster Application Window on the ISO Controlled Grid, (ii) preliminarily identify all Network Upgrades needed to address the impacts on the ISO Controlled Grid of the Interconnection Requests, (iii) preliminarily identify for each Interconnection Request required Interconnection Facilities, (iv) assess the Point of Interconnection selected by each

TRANSMISSION SYSTEM ENGINEERING

Interconnection Customer and potential alternatives to evaluate potential efficiencies in overall transmission upgrades costs, (v) establish the maximum cost responsibility for Network Upgrades assigned to each Interconnection Request in accordance with ISO Tariff Appendix Y Section 6.5, and (vi) provide a good faith estimate of the cost of Interconnection Facilities for each Interconnection Request. (Emphasis added)

The Phase II Interconnection Study refines the Phase I Study by “updat[ing], as necessary, analyses performed in the Phase I Interconnection Studies to *account for the withdrawal of Interconnection Requests.*” (Emphasis added, see Section 6.1.5.1 of CAISO BPM for Generator Interconnection). In other words, the Phase I Interconnection Study presents a worst case estimate of the need for network upgrades. When generators drop out of the queue, the Phase II Interconnection Study revises the transmission network system upgrades that would be required to support anticipated generation based on the smaller cache of generators. Thus, the Phase II Interconnection Study for the Queue Cluster 3 and 4 is not “required” because Staff can make a conservative estimate of downstream transmission facilities based on the Phase I Interconnection Study. However, as discussed above, impacts of the proposed project cannot be correlated to any particular downstream impact resulting from the cluster as a whole. Moreover, the publication of the Phase II Interconnection Study is the responsibility of the Participating Transmission System Operator and CAISO, and is outside the control of the Applicant. In sum, the FSA should not be delayed based on the publication of the Phase II Interconnection Study.

FINDINGS OF FACT

No findings of fact listed are listed in the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

Applicant has no comments on the proposed conditions.

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

**Applicant's General Comments and Comments to Conditions of Certification
on the Preliminary Staff Assessment**

PROJECT ALTERNATIVES

GENERAL COMMENTS

1. The PSA's Alternative Analysis does not to comply with the substantive requirements of CEQA because it arbitrarily and improperly rejects Applicant's Project Objectives. According to the California Supreme Court, the EIR is the heart of CEQA and the alternative analysis is the "core of an EIR." (*Citizens of Goleta Valley v. Board of Supervisors*, 52 Cal.3d 553, 564 (1990) ("*Goleta Valley*").) The basic purpose of the CEQA alternatives analysis is to identify ways in which the objectives sought by the proposed project might be achieved while also avoiding or substantially lessening any of the significant effects of a project. (14 C.C.R. § 15126.6(a)). To achieve this purpose, CEQA mandates that the FSA include a "statement of the objectives *sought by the proposed project*", and to analyze a "reasonable range" of project alternatives that will "feasibly attain" most of those project objectives (14 C.C.R. § 15124(b), 15126.6(a) (emphasis added).) Per the CEQA Guidelines, the statement of objectives sought by the project "should include the *underlying purpose of the project.*" (14 C.C.R. § 15124(b) (emphasis added)).

Instead of analyzing a *reasonable* range of alternatives selected on the basis of the "objectives sought by the project," as CEQA requires, the PSA completely sets them aside. The Alternatives analysis in the PSA eliminates the most significant and fundamental objective sought by the Project - constructing and operating a 750 MW solar thermal facility *using BrightSource Energy Inc.'s proprietary solar power tower technology*. (AFC at p. 1-4).¹ The PSA instead replaces the Project Objectives with CEC Staff objectives, including "construct and operate an approximately 500 megawatt (MW) solar generating facility capable of helping to meet the California Renewable Portfolio Standard requirements." (PSA, p. 6.1-4). The PSA's alternatives analysis thus focuses on a generic set of CEC Staff Objectives, rather than the Project's underlying purpose, as required by CEQA. The result of this legal error is an overly general range of analyzed alternatives that would not meet most of the "objectives sought by the project". This is a clear violation of the "reasonable range" requirement of CEQA Guideline Sections 15124(b) and 15126.6(a).

According to the PSA, Staff replaced the "objectives sought by the project" with Staff's preferred generic objectives in order to "facilitate . . . analysis of a reasonable range of potentially feasible alternatives, including alternatives that may not be preferred by the project applicant." (PSA, p. 6.1-4.) The PSA goes on to assert that Applicant's objectives "unduly restrict staff's analysis."

The "objectives *sought by the project*" cannot be summarily dismissed by characterizing them as Applicant's mere "preference." Rather, the Project Objectives are the entire reason Applicant filed an AFC in this proceeding. Absent these objectives, there is no project. To dismiss the project's important, foundational objectives as mere "preference" is inconsistent with one of the fundamental purposes of CEQA: to identify whether there are alternatives to the project that avoid or substantially lessen any of the significant effects of a project but which would

¹ In addition, the PSA omits key objectives that make the Project commercially feasible – *i.e.*, achieving a commercial on-line date in fourth quarter of 2015/first quarter of 2016 and compliance with power sales agreement provisions.

PROJECT ALTERNATIVES

feasibly attain *most* of the basic objectives sought by the project. (See, 14 C.C.R. §§ 15124,15126.6 (emphasis added).) Moreover, the PSA does not provide any evidence or analysis to support its naked assertion that Applicant's objectives preclude a reasonable range of alternatives.

Complete rejection of the "objectives sought by the project" is a departure from the Commission's past practice. For example, the PSA rejects the Project Objective to achieve a commercial online date of late 2015/early 2016, yet the Abengoa Staff Assessment included the project objective "[t]o start commercial operation by winter of 2012."² Similarly, the PSA rejects the Project Objective to select "a site with minimal slope, predominately 5 percent slope or less[,] yet the Rice Staff Assessment included the project objective to select a site "in areas of high solarly with ground slope of less than 6 percent."³ Finally, the PSA rejects the Project Objective "[t]o use BrightSource's proprietary technology in another utility-scale project, further proving the technical and economic viability of the technology," yet the Victorville 2 Project Staff Assessment included the similar project objective to "integrate" two specific types of technologies, which "maximizes the synergies between the two technologies to increase project efficiency."⁴ Simply put, there is no principled basis for the PSA's rejection of statement of the objectives sought by RMS SEGF where the same objectives have been acceptable to the Staff in other similarly situated proceedings.

Finally, the "objectives sought by the project" cannot be disregarded or altered on the basis that the objectives are tailored in part to achieve Applicant's business purposes. The California Supreme Court has left no doubt that the business purposes of the project proponent are an appropriate project objective:

Although a lead agency may not give a project's purpose an *artificially* narrow definition, a lead agency may structure its EIR alternatives analysis around a reasonable definition of underlying purpose and need not study alternatives that cannot achieve that basic goal. For example, if the purpose of the project is to build an oceanfront hotel or waterfront aquarium, a lead agency need not consider inland locations. (*In re Bay Delta Programmatic Env't Impact Report Coordinated Proceedings*, 43 Cal.4th 1143, 1166 (2008) (emphasis added).)

California courts have long recognized that it is perfectly acceptable to base a CEQA alternatives analysis on Applicant's underlying business objectives. (See, e.g., *Citizens of Goleta Valley v. Bd. of Supervisors*, 52 Cal.3d 553, 561 (1990) (holding that inland location alternative need not be analyzed if business objective of project is to build a waterfront hotel); *Save San Francisco Bay Ass'n v. San Francisco Bay Conservation Comm'n*, 10 Cal. App.4th 908, 924 (1992) (holding that inland location alternative need not be analyzed if business objective of project is to build waterfront aquarium); *Sequoyah Hills Homeowners Ass'n v. City of Oakland*, 23 Cal.App.4th 704, 715 (1993) (holding that low density alternative need not be analyzed if business objective is

² Abengoa Mojave Solar Desert Project Commission Decision, Docket No. 09-AFC-5, p. 23 (CEC-800-2010-008-CMF, Sept. 2010). The Commission states a similar project objective for several other large solar energy projects including: Blythe Solar Power Project, Calico Solar Power Project, Genesis Solar Energy Project and Palen Solar Power Project which all include the following project objective: "Complete the review process in a timeframe that would allow the Applicant to start construction or meet the economic performance guidelines by December 31, 2010 to potentially qualify for the 2009 American Recovery Reinvestment Act (ARRA) cash grant in lieu of tax credits for certain renewable energy projects."

³ Rice Solar Energy Project Commission Decision, Docket No. 09-AFC-10, Alternatives Section p. 2 (CEC-800-2010-019 CMF, Dec. 2010).

⁴ Victorville 2 Project, 07-AFC-1, Preliminary Staff Assessment, p. 6-3.

PROJECT ALTERNATIVES

providing multi-family housing); *Ass'n of Irrigated Residents et al. v. County of Madera*, 107 Cal.App.4th 1383, 133 (2003)(holding that a reduced herd size alternative need not be analyzed if it would not achieve the business objective of proposed dairy expansion).

The foregoing case law makes clear that CEQA does not permit the Alternatives analysis to ignore the “objectives sought by the project” merely because they are tailored to achieve Applicant’s underlying business objectives. Applicant acknowledges that project objectives cannot be so narrowly drawn to foreclose a reasonable range of alternatives to the project. The PSA however rejects Applicant’s project objectives by simply asserting (without demonstrating) that Applicant’s objectives are too narrowly drawn. At minimum, the PSA should provide substantial evidence that Applicant’s objectives foreclose a reasonable range of project alternatives. Without this evidence, the PSA cannot completely discard Applicant’s project objectives and replace them with an overly broad set of objectives proposed by staff. Accordingly, the PSA should be revised to include a reasonable range of alternatives based on the “objectives sought by the proposed project,” as required by CEQA Guidelines Section 15124.

2. The PSA’s analysis of feasibility for the various alternatives is incomplete. CEQA lists several factors that should be considered in the analysis of alternatives. These factors include: “site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site.” (14 C.C.R. § 15126.6(f).) The PSA does not fully or consistently consider these factors. The PSA should include a more consistent discussion of feasibility for each alternative that includes *all* of the aforementioned factors. This is necessary to enable the Staff Assessment to “foster meaningful public participation and informed decision making,” as required by CEQA (Id.)
3. The PSA analyzes a reduced acreage 250 MW alternative, without recognizing that Applicant is already pursuing a reduced acreage alternative that was proposed in the Application for Certification. On July 23, 2012, Applicant filed an “Environmental Enhancement Proposal,” which changed the project description from a three unit project to a two unit project. Removal of RMS 3 has benefits for biological and cultural resources. It also represented a loss of 250 MW of clean and fast starting renewable energy in Southern California. Applicant’s Proposal is consistent with the fundamental objectives of CEQA – i.e., the consideration of alternatives to a proposed project. While Applicant does not contest the PSA’s consideration of a reduced acreage 250 MW alternative, the PSA should also recognize that Applicant is already pursuing a reduced acreage alternative as the new proposed project, consistent with the fundamental objectives of CEQA.

Moreover, as noted in General Comment 2 above, the PSA does not consider many important factors in evaluating the feasibility of an alternative. With respect to the reduced acreage alternative, the PSA should consider the economic viability. Importantly, a single unit site for this particular project is not economically viable and therefore the alternative is infeasible.

4. Throughout Applicant’s comments on the PSA, Applicant has identified revisions to the PSA’s analysis and conclusions. Applicant requests that the revisions proposed in each resource area (especially, biology, cultural, visual, and paleontology) be reviewed by the staff working on the alternatives section such that these revisions will also be reflected in the alternatives analysis.
5. Applicant considers the Sonoran West project site to be substantially equivalent to the RMS project site in terms of general site conditions and availability of infrastructure. The environmental impacts of a project on the Sonoran West site are expected to be similar to the

PROJECT ALTERNATIVES

impacts of a project on the RMS site. Sonoran West would not meet key project objectives, including the attainment of a commercial online date as required in the Power Purchase Contract with Southern California Edison. While the Sonoran West site cannot meet the primary project objectives of the RMS project, Applicant ultimately intends to pursue both projects and believes that the Commission should consider both projects as potential contributors to the state's renewable energy, greenhouse gas and economic goals.

6. The PSA does not satisfy the requirements of CEQA by allowing for the examination of a range of feasible alternatives sufficient to "permit a reasoned choice." (14 C.C.R. § 15126.6(f).) No "reasoned choice" is possible when the examined alternatives exceed the realm of feasibility for a project proponent. Further, the Commission may exclude from detailed consideration an alternative located outside of its decision making authority as infeasible. (*See, Goleta Valley*, 52 Cal.3d at 575 (upholding agency rejection of alternative outside of agency's permit jurisdiction).) The PV alternative clearly exceeds the realm of feasibility as an alternative to the Project and does not permit "a reasoned choice" among a range of alternatives that can actually be implemented, in contravention of CEQA. The Warren Alquist Act provides the CEC with jurisdiction over thermal power plants 50 MW or greater. Since PV is not a thermal technology, the Commission lacks the jurisdiction to approve a PV alternative.⁵ Moreover, Applicant is not a PV developer. For these reasons, inclusion of PV does not permit a reasoned choice because neither the Commission nor Applicant can pursue the PV alternative. The PV alternative cannot be considered a potentially feasible alternative and should not have been analyzed in detail. The PV alternative should be eliminated from detailed consideration in the FSA.

Notwithstanding these concerns, if staff still analyzes the PV alternative in detail, the PSA should include a substantiated analysis regarding the feasibility of the alternative. First, the PSA does not include important information that is needed to evaluate the feasibility of the PV alternative. In particular, PSA text describes Figure 7 as showing pictures of PV Projects, but only Figures 1-5 were included in the PSA. Second, as noted in comment two above, the feasibility analysis for all of the alternatives fails to foster informed decision making by inconsistently applying the factors listed in the CEQA Guidelines for evaluating feasibility. This is especially problematic in the PSA's discussion of the PV alternative. The feasibility analysis for the PV alternative should be revised to recognize that the alternative is infeasible from an economic viability perspective. Applicant is not a PV developer and would not be able to develop the project site as a PV project. Moreover, since the Commission cannot approve a PV project, the PV alternative would not significantly reduce any of the environmental impacts of the preferred alternative.

7. The PSA does not fully discuss and analyze the grading requirements for solar PV and parabolic trough projects. Impacts from large-scale grading are completely ignored in the alternatives analysis and would be substantially greater than Applicant's proposed development methodology for the heliostat field. All of the Projects listed in Alternatives Table 4 where the technology is defined will utilize mass grading or other earth moving techniques that would completely disrupt the project site and create more permanent impacts with respect to soil and surface water resources. They are as follows:

⁵ In the Ridgecrest Solar Energy Project siting case (09-AFC-09) staff asserted that the Energy Commission does not have jurisdiction over entirely PV Projects. See Staff Brief, available at: http://www.energy.ca.gov/sitingcases/solar_millennium_ridgecrest/documents/2011-07-05_staff_reply_brief.pdf

PROJECT ALTERNATIVES

- AV Solar Ranch One Project: Site preparation activities for the solar field involve heavy earthwork including mass grading, excavation, and backfill; the total grading related cut and fill estimate of approximately 1,800,000 cubic yards (Final EIR, 2010)
- Desert Sunlight Solar Farm Project: Where feasible, the project will utilize a “disc and roll” technique that uses farm tractors to till the soil over much of the Solar Farm site and then roll it for compaction; all areas will utilize conventional cut and fill grading (Final EIS, 2011)
- Topaz Solar Farm Project: An agricultural tool, such as a harrow or cultipacker, would be used to loosen and smooth the top one to three inches of soil and a smooth steel drum roller, or similar equipment, would be used to bring the top four to six inches of soil to a compaction value of approximately 80 percent (Final EIR, 2011)
- Mt. Signal Solar Farm 1 and Calexico I and II: Site preparations activities for the solar field involve heavy earthwork including grading, excavation, and backfill (Final EIR, 2011)

The grading required at these projects is depicted in Figure *Alternatives 1* attached to these comments. The Ivanpah Solar Electric Generating System is also shown for comparison purposes. The extensive grading required by the PV and parabolic trough projects identified in the PSA would increase impacts to the following non-exclusive list of resource areas: air quality, biological resources, cultural resources, paleontological resources, and soil and surface water resources. In particular, the massive grading destroys all onsite vegetation and would result in 100% disturbance to Waters of the US and Waters of the State of California. The PSA should be revised to consider the significant impacts that would result from the large-scale grading required by solar PV and parabolic trough alternatives, which are avoided under the proposed project.

8. Please replace “foundation” with “insertion” when discussing heliostat pylon installation. The pylons for the heliostats will be inserted into the ground by vibration, and will not require any specialized foundations.

FINDINGS OF FACT

There are no findings of fact listed in this section of the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

No proposed Conditions of Certification are included in the PSA.



AV Solar Ranch One Project, Antelope Valley



Desert Sunlight Solar Farm Project, Chuckwalla Valley



California Valley Solar Ranch Project, Carrizo Plain



Topaz Solar Farm Project, Carrizo Plain



Ivanpah SEGS, Unit 1 (Rio Mesa SEGF Technology)



Ivanpah SEGS, Unit 1, (Rio Mesa SEGF Technology)

SOURCES:
 AV Solar Ranch One, Desert Sunlight Solar Farm Project, and Topaz Solar Farm photos
 from firstsolar.com
 California Valley Solar Ranch photo from www.californiavalleysolarranch.com
 Ivanpah photos from ivanpahsolar.com

**GRADING COMPARISON BETWEEN RIO MESA SEGF
 TECHNOLOGY AND VARIOUS PV PROJECTS**



NO SCALE

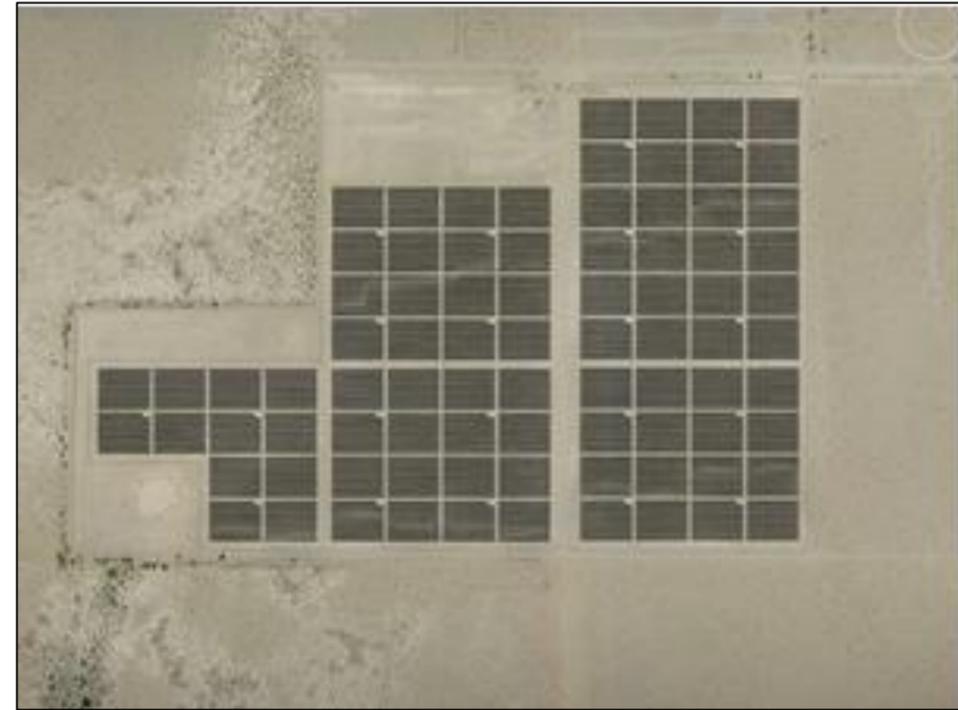
CREATED BY: AR	DATE: 11-01-12	FIG. NO:
PM: AL	PROJ. NO: 27652105.00513	ALT-1



Blythe Solar Project



Ivanpah SEGS
(Rio Mesa SEGF Technology)



Satellite image from 5000 feet of Blythe Solar Project



Ivanpah SEGS, (Rio Mesa SEGF Technology)



Satellite image from 5000 feet of Ivanpah SEGS, (Rio Mesa SEGF Technology)



Blythe Solar Project

SOURCES:
Blythe Solar Project photos from firstsolar.com
Ivanpah photos from ivanpahsolar.com
Satellite images from google, dated 6/8/12

**DENSITY COMPARISON BETWEEN RIO MESA SEGF
TECHNOLOGY AND TYPICAL PV PROJECT**

URS

NO SCALE

CREATED BY: AR

DATE: 11-01-12

FIG. NO:

PM: AL

PROJ. NO: 27652105.00513

ALT-2

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)**

**Applicant's General Comments and Comments to Conditions of Certification
on the Preliminary Staff Assessment**

**GENERAL CONDITIONS
INCLUDING COMPLIANCE MONITORING AND CLOSURE PLAN**

GENERAL COMMENTS

No general comments.

FINDINGS OF FACT

No findings of fact are listed in the PSA.

PROPOSED CONDITIONS OF CERTIFICATION

1. **Page 7-14:** Please add the following Condition of Certification:

Deadline for Review and Comment (COMPLIANCE-16)

Where a condition of certification provides for review and comment by any other agency of any construction-related document and no deadline for review and comment is specified, the CPM or CBO shall allow 14 days from the agency's receipt of the document for the agency to submit its comments, after which the CPM may approve the subject document.