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March 8, 2012

Pierre Martinez
Project Manager
Systems Assessment & Facility Siting Division
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814

Subject: Data Responses, Set 1A (#1-84)
Rio Mesa Solar Electric Generating Facility (11-AFC-04)

Dear Mr. Martinez:

On behalf of Rio Mesa Solar I, LLC, Rio Mesa Solar II, LLC, and Rio Mesa Solar III, LLC, please find enclosed an electronic copy of Data Responses, Set 1A (#1-84) in response to Staff's Data Requests filed on February 7, 2012. Five CD ROMS are being provided for Staff. Hard copies and/or CDs will be sent to the Proof of Service list.

Sincerely,



Angela Leiba, Vice President
Senior Project Manager/ Environmental Department Manager

Enclosure

cc: POS List
Project File

BrightSource

Applicant's Response to Data Requests, Set 1A (Nos. 1-84) for the APPLICATION FOR CERTIFICATION for the Rio Mesa Solar Electric Generating Facility

(11-AFC-04)






Submitted to:

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

Submitted by:

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March 8, 2012

Applicant's Response to Data Requests, Set 1A (Nos. 1-84)

for the

Application for Certification

for the

Rio Mesa Solar Electric Generating Facility

(11-AFC-04)

Submitted to the
California Energy Commission

Submitted by
Rio Mesa Solar I, LLC,
Rio Mesa Solar II, LLC,
and Rio Mesa Solar III, LLC

March 8, 2012

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Introduction

Attached are responses from Rio Mesa Solar I, LLC, Rio Mesa Solar II, LLC, and Rio Mesa Solar III, LLC (collectively the "Applicant") to the California Energy Commission (CEC) Staff's Data Requests Set 1A (Nos. 1 – 84). Staff served these data requests on February 7, 2012. The responses are grouped into the following disciplines: Air Quality, Alternatives, Land Use, Socioeconomics, Traffic and Transportation, Transmission System Engineering, Waste Management, Worker Safety and Fire Protection, and Biological Resources. Responses are presented in the same order provided by CEC staff, and are keyed to the data request number (1 through 84). Tables and attachments are numbered in referenced to the data request number.

On February 27, 2012, Applicant provided notice of its objections pursuant to Title 20, California Code of Regulations, Section 1716(f). Applicant objected to Data Requests 44, 54, 58, 45, 49, 55, and 57, and objected in part to Data Request 63. Applicant also noticed the need for additional time to respond to Data Requests 5, 8, 15, 16, 22, and 43. Should Applicant respond to Data Requests 55, and 57, Applicant will also require more time without waiving its objections. In addition to Applicant's responses below, additional confidential information responding Data Requests 4, 25, and 26 will be submitted directly to the CEC Executive Director with an application for confidentiality.

Air Quality (Nos. 1-24)

Data Request

1. *Please provide copies of all substantive District correspondence regarding the Preliminary or Final Determination of Compliance, including e-mails, within one week of submittal or receipt. This request is in effect until the final Commission Decision has been recorded.*

Response:

Applicant will provide copies of substantive District correspondence, including e-mail messages, related to the permit application within five days of submittal or receipt, provided that this correspondence does not contain information that is privileged or confidential. Copies will be provided until the Final Determination of Compliance is issued by the District. Copies of submittals to and correspondence from the MDAQMD that we have exchanged with the District to date and that were not included in the AFC have been docketed (Log # 62602, dated 10/10/11).

Data Request

2. *Please describe the types of activities that emit combustion and fugitive dust emissions on the site currently and the estimated quantities of those emissions that occur from those activities.*

Response:

As discussed in the AFC (Section 2.1.2), the project site has been previously disturbed by military training operations during World War II, and investigative activities resulting from the proposed SunDesert Nuclear Power Plant by San Diego Gas and Electric (SDG&E) in the 1970s. Additionally, existing electric and gas transmission lines traverse the project site including the following:

- WAPA 161kv electric transmission line
- IID 161kv electric transmission line
- TransCanada North Baja gas transmission line

Finally, an existing unpaved graded road (Bradshaw Trail) is located on the property. The only onsite activity that could currently emit combustion and fugitive dust emissions is casual vehicle traffic, which would be sporadic and therefore cannot be quantified with any degree of accuracy.

Data Request

3. *Please describe whether those activities will be permanently discontinued when the project is completed and estimate the reductions from the current onsite baseline emissions.*

Response:

Any activities currently taking place on the site will be permanently discontinued in the specific locations that they are currently occurring once construction commences and property line security fences are in place. Bradshaw Trail is proposed to be rerouted around the northern boundary of the Rio Mesa Solar 3 project, so the emissions that are currently occurring as a result of the existing use of the road (e.g., off highway vehicle) will likely remain. As discussed in Data Response 2, because existing activity cannot be quantified with any degree of accuracy, no emission reductions can be estimated.

Data Request

4. *Please provide the spreadsheet version, in electronic format, of the Appendix 5.1 F Construction Emission Worksheets with the embedded calculations.*

Response:

The requested spreadsheet file contains information that is confidential and proprietary to Sierra Research, Inc. As such, this file, along with an application for confidential designation, is being submitted separately from this set of data responses pursuant to Sections 2505 et seq. of the Commission's Regulations.

Data Request

5. *The construction emissions and impacts should be evaluated for the actual Tiered engines to be used during construction. Please identify the Tier levels of all of the off-road equipment and associated emission factors. Please revise the emission calculations and corresponding impact analysis based on reasonable construction vehicle fleet composition to account for the possibility that some of the vehicles may not be available with Tier 3 or 4 engines.*

Response:

The construction impacts presented in the AFC assumed that all construction vehicles were equipped with Tier 3 or better engines, based on the effective dates of the respective non-road engine standards. This approach was taken to match the construction equipment mitigation requirements developed by the CEC over the past few years for power plant projects. Specific Tier assumptions were shown in the construction emissions calculations attachment to the AFC (Appendix 5.1F, Attachment 5.1F-1); the specific table showing the requested information is included as Attachment DR 5-1 for convenience.

To adjust the construction combustion emission estimates to account for the possible difficulty in procuring equipment with Tier 3 or better engines, Applicant is in the process of revising the construction emission calculations to account for the use of equipment with Tier 2 engines. Once the construction emissions are revised, the Applicant will re-model the ambient impacts due to construction activities. On February 27, 2012, Applicant filed a notice pursuant to Section 1716(f) that additional time would be necessary to respond to this data request given the extensive nature of the emissions calculations and modeling requested. A response to this data request will be filed on or before April 15, 2012.

Data Request

6. *Please provide the input assumptions to obtain the OFFROAD and EMFAC2007 Model raw engine emission factors, the assumptions used to derive the equipment specific emission factors, and please provide the spreadsheets used to create the emission factors shown in Appendix 5.1 F, with underlying equations intact.*

Response:

The OFFROAD2007 model was not used directly to produce the emission factors used in the analysis; rather, the underlying methodology built into the OFFROAD model was used. As noted in the detailed construction calculations included in the AFC, [1] this method is described in U.S.EPA's NONROAD model documentation ("Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling--Compression-Ignition," NR-009D, EPA-420-R-10-018, dated July 2010). [2] The basic methodology is to multiply a zero-hour (certification) emission factor by a transient adjustment factor, a deterioration factor, a fuel sulfur adjustment factor (as applicable), and a load factor.

$EF_{adj} = EF_{ss} \times TAF \times DF$ [Equation 1, for HC, CO and NOx]
$EF_{adj} = EF_{ss} \times TAF \times DF - S_{PMadj}$ [Equation 2, for PM]

where:

EFadj = Final emission factor used in the analysis (g/hp-hr)
EFss = Zero-hour, steady state emission factor (g/hp-hr)
DF = Deterioration factor
TAF = Transient adjustment factor
SPMadj = Fuel sulfur adjustment factor (g/bhp-hr)

These adjustments are necessary to correct the engine certification emission factors (based on tightly-controlled laboratory conditions) to "real world" emission factors. Computation of the off-road emission factors is performed in the Excel spreadsheet which is being provided in a separate confidential filing also discussed under Data Response 4. Deterioration factors are a function of the fraction of the vehicle's useful life expended; since there is no information available upon which to base a determination of historical construction vehicle use, the deterioration factors are assumed to be equal to 1 in these calculations.

Provided below is a sample calculation for a 215 bhp Tier 3 grader. The adjustment factors obtained from the NONROAD report tables are provided in Table DR 6-1.

[1] Appendix 5.1F, Attachment 5.1F-1; the specific table showing the requested information is included here as Attachment DR5-1 for convenience.

[2] Available at http://www.epa.gov/otaq/models/nonrdmdl/nonrdmdl2010/420r10018.pdf

Table DR 6-1.
Adjustment Factors Used in Sample Calculation

Factor/Source	VOC	CO	NOx	PM_{10}
EF_{ss} (from Table A-4)	0.1836	0.7475	2.5	0.15
TAF (from Table A-5)	1.05	1.53	1.04	1.47
S_{PMadj} (from Equation 5)[3]	--	--	--	-0.0859

EFadj NOx = 2.5 g/bhp-hr * 1.04 * 1 = 2.60 g/bhp-hr
EFadj PM10 = 0.15 g/bhp-hr * 1.47 * 1 - 0.0859 g/bhp-hr = 0.1346 g/bhp-hr

The assumptions used in each EMFAC model run appear in the heading of the EMFAC output that was included in Appendix 5.1F, Attachment 5.1F-1 to the AFC. NOx, CO, VOC, and SO_2 emissions were based on EMFAC2007 V2.3 runs that used the assumptions listed below.

Scenario year: 2013 – All model years in the range 1969 to 2013 selected
Season: Annual
Area: Mojave Desert Air Basin[4] Average
I/M Status: Enhanced Basic (2005) – Using I/M schedule for area 69 San Bernardino (MD)

All emission factors were averaged annually, using the default I/M program for the geographic area. It is noted that the I/M program settings do not affect the emissions from diesel-fueled vehicles, which represent the vast majority of assumed construction-related vehicle activity.

The emission factors are calculated in the Excel spreadsheet that is being provided in a separate confidential filing as discussed under Data Response 4.

Data Request

7. *Please identify all feasible and cost-effective measures to mitigate the impacts of construction related NOx, VOC, PM10/2.5 and PM10/2.5 precursor emissions. These may include a dust mitigation plan, Diesel-Fueled Engine Control, Dust Plume Response Requirement, Fugitive Dust Control, etc.*

Response:

On page 5.1F-2 of Appendix 5.1F of the AFC, Applicant proposed a list of measures intended to control potential emissions of fugitive dust. Prior to construction, Applicant will also prepare a dust mitigation plan and expects to implement diesel-fueled engine control conditions as are typically imposed by the CEC as part of its licensing proceeding. Since the CEC's standard construction mitigation conditions are sometimes custom-tailored for specific projects and/or sites, Applicant will work with the staff to ensure that a suitable set of conditions is established for Rio Mesa SEGF. Furthermore, our analysis reflects our expectation of what those conditions will look like based on our review of CEC decisions for previous, similar projects.

[3] The default factor of 0.33 wt% was used for soxbas; soxdsl is 0.0015 wt% reflecting CARB diesel fuel.
[4] The Mojave Desert Air Basin is the geographic area that is under the jurisdiction of the MDAQMD.

Data Request

8. Please include the emissions from mirror washing activities in the total facility emissions and corresponding impact analysis.

Response:

Applicant believes it is not appropriate to include emissions from mirror washing activities in the total project emissions shown in Table 5.1-25 because, as discussed in Applicant's January 30, 2012 Comments Regarding Rio Mesa Solar Electric Generating Facility (11-AFC-04) Issues Identification Report and Staff's Proposed Schedule (Docket Log # 63475), emissions from mirror washing activities are not part of emissions from the stationary source. However, Applicant will provide this analysis as part of the air quality modeling analysis currently being performed to respond to Data Request 5. On February 27, 2012, Applicant filed a notice pursuant to Section 1716(f) that additional time would be necessary to respond to this data request given the extensive nature of the modeling requested. A response to this data request will be filed on or before April 15, 2012.

Data Request

9. Please provide a review of available alternative low emission vehicle technologies, including compressed natural gas, electric, and hydrogen fueled vehicles, and other technologies that could be used to replace the proposed diesel and gasoline fueled vehicles used for operations maintenance if lower emission alternative technology vehicles are both available and cost effective.

Response:

Applicant believes that such a review is not necessary because adequate mitigation will be provided with the use of the latest model year/tier vehicles for operations maintenance (i.e., mirror washing activities). Furthermore, the alternative fuel technologies identified by the staff will likely require substantial supporting infrastructure that will, in turn, need to be subjected to additional environmental analysis. The air quality modeling analysis currently being performed in response to Data Request 8 is expected to show that there will be no new significant air quality impacts associated with the operations maintenance activities. Therefore, there is no need for mitigation beyond that proposed in the AFC.

Data Request

10. Please confirm that there will be no dedicated gasoline fueled onsite vehicles.

Response:

All of the onsite vehicle fleet (mirror washing vehicles) will be diesel-fueled. The Applicant does not anticipate using any dedicated gasoline-fueled vehicles onsite during project operation, so no gasoline refueling facilities will be required. There may be a few gasoline pickup trucks used by the plant operating/maintenance staff. If this is the case, the pickups would be refueled at service stations located in the nearby community of Blythe. Gasoline may also be used by some of the equipment/vehicles during the construction phase of the project.

Data Request

11. Please confirm that there will be no vehicle refueling gasoline storage tank at the site.

Response:

As discussed in Data Response 10, all of the onsite vehicle fleet (mirror washing vehicles) will be diesel-fueled, and onsite refueling will be provided for this equipment. There will be no gasoline storage tanks at the site.

Data Request

12. Please identify the locations and distances to available gasoline refueling facilities expected to be used (if any) and provide estimates of emissions due to the transportation of vehicles between the project site and the refueling facilities and include these emissions in an updated operating emissions table 5.1-26.

Response:

As discussed in the response to Data Request 10, there may be a few gasoline pickup trucks used by the plant operating/maintenance staff. These pickups will be refueled at service stations located in the nearby community of Blythe (approximately 13 miles from project site). The emissions associated with travel between the project site and local service stations will be inconsequential/de minimis. No onsite gasoline refueling facilities will be required.

Data Request

13. Please confirm that the information provided in the data response for Hidden Hills SEGS also applies to the Rio Mesa SEGF project.

Response:

The Data Response AQ-2 contained in the supplemental data response for the Hidden Hills SEGS (11-AFC-02, Docket Log # 63259, December 30, 2011) also applies to the Rio Mesa SEGF.

Data Request

14. If there is any potential for NOx emissions at the surface of the solar receiver, please estimate the emission rate expected at the surface of the solar receiver (lbs/day and tons/year) and describe what can be done to offset any such emissions or provide evidence that shows there will not be significant emissions of nitrogen oxides.

Response:

As discussed in Data Response AQ-2 contained in the supplemental data response for the Hidden Hills SEGS (11-AFC-2, Docket Log # 63259, December 30, 2011), according to an EPA technical bulletin on NOx formation and control (see Attachment DR 14-1, page 3) thermal NOx formation becomes

significant above about 1300 °C (2370 °F). The expected Solar Receiver Steam Generator (SRSG) panel temperature will be approximately 700°C (1300 °F), which is well below the temperature range where thermal NOx will form. Therefore, Applicant does not believe it is necessary to provide mitigation to address this issue.

Data Request

15. Please explain why and how the same auxiliary boilers are used differently in these two projects.

Response:

Pursuant to Title 20, California Code of Regulations, Section 1716(f), Applicant on February 27, 2012 filed for additional time to respond to Data Request 15. In order to ensure that the emissions information and the comparison accounts for Applicant's boiler optimization plans, which are being performed for both the Hidden Hills SEGS and Rio Mesa SEGF projects, Applicant requires additional time to respond to this request. Applicant will submit a response to these data requests on or before April 15, 2012.

Data Request

16. Please provide the spreadsheet version, in electronic format, of the GHG emission calculations for the auxiliary boilers.

Response:

Pursuant to Title 20, California Code of Regulations, Section 1716(f), Applicant on February 27, 2012 filed for additional time to respond to Data Request 16. In order to ensure that the emissions information and the comparison accounts for Applicant's boiler optimization plans, which are being performed for both the Hidden Hills SEGS and Rio Mesa SEGF projects, Applicant requires additional time to respond to this request. Applicant will submit a response to these data requests on or before April 15, 2012.

Data Request

17. Please provide details of the SF6 onsite inventory and leakage emissions both in operation and construction phases to complete the GHG emission estimates.

Response:

The estimated onsite SF_6 inventory and leakage emissions during plant operations are accounted for in the GHG emissions calculations presented in Appendix 5.1B, Table 5.1B-12 of the AFC. As indicated in Note 6 to that table, SF_6 will be used in six 230 kV breakers (five in use, one in storage) in the common area and in one generator circuit breaker at each power block. Each 230 kV breaker contains approximately 208 pounds of SF_6, while each generator circuit breaker will contain 24.2 pounds of SF_6. The IEC standard for SF_6 leakage is less than 0.5 percent; the NEMA leakage standard for new circuit breakers is 0.1 percent. In our calculations, we conservatively assumed a maximum leakage rate of 0.5 percent, resulting in estimated SF_6 emissions of up to 0.003 metric tons per year. Applying a GWP of 23,900, this yields a CO_2-equivalent emission rate of approximately 71.7 metric tons per year. No additional SF_6-containing equipment will be onsite during the construction phase.

Data Request

18. Please explain in detail why modeling was not considered necessary for commissioning in light of the fact that some cold startups do not reflect the highest emissions scenarios.

Response:

Applicant performed separate, specialized modeling analyses only when an operational scenario had not already been considered in the AFC. In the example cited by staff, emissions from auxiliary boilers operated at full load during commissioning are not higher than emissions from the auxiliary boilers operated at full load during normal operations. This is because full load operation of the auxiliary boilers during the commissioning period does not occur until several days of lower load testing/tuning has been completed; thus, the auxiliary boilers are able to achieve normal operating emission levels during full load commissioning activities. Therefore, the impacts from those boilers during that phase of commissioning would not be any higher than the impacts already evaluated for normal operations and presented in Table 5.1-37 of the AFC.

The statement in Section 5.1.4.5, Page 5.1-63 of the AFC that reads "Maximum emissions from each boiler are expected to occur during the cold start/tuning phase of commissioning…" is not correct as written. While emissions are highest during the boiler cold start/tuning phase on a lb/MMBtu basis, they are not necessarily highest on a lb/hr basis.

Data Request

19. Please provide additional results for commissioning impact analysis if impact during commissioning is higher than that during cold startups.

Response:

As discussed in Data Response 18, impacts during full load operation of the boilers during commissioning are the same as during normal full load operation of the boilers, and have already been evaluated in the AFC; thus, additional analysis is not necessary.

Data Request

20. Please explain why the Blythe Solar Power Project is not included in the cumulative impacts analysis.

Response:

The Blythe Solar Power Project was not included in the cumulative impact analysis performed as part of the AFC for the Rio Mesa SEGF because this project was not included in the MDAQMD's August 29, 2011 letter responding to Applicant's request for a listing of permits issued since January 1, 2010, for projects located within six miles of the Rio Mesa SEGF (AFC, Appendix 5.1G, Attachment 5.1G-1). According to a recent discussion with the MDAQMD, the District did not include the Blythe Solar Power Project in the District's August 29, 2011 letter because all of the MDAQMD permits for the Blythe Solar Power Project had expired without commencement of construction. According to the MDAQMD, this

continues to be the case with no active permits and/or permit applications filed for the Blythe Solar Power Project.

Data Request

21. Please update the cumulative analysis by including the Blythe Solar Power Project if the exclusion of it cannot be justified.

Response:

As discussed in Data Response 20, there are no active permits/permit applications filed with the MDAQMD for the Blythe Solar Power Project. Therefore, it is not necessary to include this project in the cumulative analysis for the Rio Mesa SEGF.

Data Request

22. Please check and correct the inconsistencies between the modeling files and AFC, including but not limited to the above mentioned ones, to make sure they match with each other.

Response:

Regarding the inconsistencies noted for the construction dust emission rates, an outdated version of the construction modeling summary table was inadvertently included in Attachment 5.1F of the AFC. The construction modeling was performed using the correct emission rates, and the correct version of the Attachment 5.1F construction modeling summary table is enclosed as Attachment DR 22-1. The other construction emission summary tables included in Attachment 5.1F of the AFC appear to be current and correct.

With regard to the inconsistencies noted for the NOx and SOx emission rates associated with the startup boilers undergoing a startup (with the nighttime preservation boilers in operation), the boiler NOx and SOx emission rates shown in AFC Table 5.1D-3 are correct. However, it appears that the modeling for this boiler operating case was performed using the wrong NOx and SOx emission rates (SOx emission rates were inadvertently used for modeled NO_2 impacts, and NOx emission rates were used for SO_2 modeled impacts). The Applicant is in the process of re-modeling this operating case, and the results will be included with the additional air quality impact modeling discussed in Data Response 5. On February 27, 2012, Applicant filed a notice pursuant to Section 1716(f) that additional time would be necessary to respond to this data request given the extensive nature of the modeling requested. A response to this data request will be filed on or before April 15, 2012

With regards to the inconsistencies noted for the nighttime preservation boiler CO emission rate used for inversion fumigation impacts, the nighttime preservation boiler CO emission rate of 6.917E-2 g/sec shown in AFC Table 5.1D-5 is correct. However, it appears that in the inversion fumigation modeling Excel spreadsheet included in Applicant's modeling CD the incorrect CO emission rate was used for the nighttime preservation boiler. Applicant is in the process of re-modeling air quality impacts as discussed in Data Responses 5 and 8, and the revised nighttime preservation boiler inversion fumigation CO impacts will be included with this additional air quality impact modeling. On February 27, 2012,

Applicant filed a notice pursuant to Section 1716(f) that additional time would be necessary to respond to this data request given the extensive nature of the modeling requested. A response to this data request will be filed on or before April 15, 2012.

As part of the above modeling effort, Applicant will check and correct as necessary any remaining inconsistencies between the emission levels summarized in the AFC and used for air quality impact modeling.

Data Request

23. Please provide a sensitivity study on how the total N02 impact would change if the N02 and ozone measurements are from the same monitoring station (i.e. Palm Springs).

Response:

The air quality modeling for the Rio Mesa SEGF AFC was performed pursuant to a CEC Staff approved modeling protocol (AFC, Appendix 5.1H). The modeling protocol clearly identifies Palm Springs as the ambient monitoring station for NO_2 and Blythe as the ambient monitoring station for ozone. Applicant agrees with the CEC Staff conclusion that ambient ozone levels in Blythe are lower than levels monitored in Palm Springs. Applicant also agrees with the CEC Staff conclusion that the use of ozone data collected in Palm Springs would likely lead to higher modeled NO_2 impacts compared to modeling with ozone levels collected at the nearby Blythe monitoring station. However, these facts do not result in reduced conservatism in the air quality impact modeling performed for the Rio Mesa SEGF. This is because the air quality impact modeling performed for the Project already over-predicts impacts with the use of ambient NO_2 data from Palm Springs (which, like ozone levels, overestimates background NO_2 levels for the project site because Palm Springs is located closer to large urbanized areas compared to the project site). Applicant believes that the use of ozone data collected at the Blythe monitoring station is more representative of project site conditions than ozone data collected at the Palm Springs station. Because the use of background ozone data collected at Blythe and NO_2 data collected at Palm Springs results in an overestimation of modeled NO_2 project impacts, Applicant does not believe it is necessary to further increase these modeled impacts by performing the requested sensitivity study.

Data Request

24. Please provide fuel use documentation in MMBTUs that demonstrates compliance with Public Utilities Code 399.12(h)(3), which defines the maximum allowable quantity of fuel input that enables this project to qualify for renewable energy credits. This documentation should allow for computation of the percentage of annual heat input from fossil fuel use relative to total heat input.

Response:

Public Utilities Code section 399.12(h)(3)(A) relates to renewable energy credits (RECs), and the Energy Commission's power to establish the criteria for renewable energy resources to be eligible to create RECs. This provision is not an applicable LORS for which the Staff must evaluate compliance. Questions regarding the creation of RECs are not relevant to any analysis of environmental impacts, but instead relate to commercial issues.

Alternatives (Nos. 25-27)

Data Request

25. Please provide either a copy of the PPA or relevant sections of the PPA that are referenced in the AFC with regard to determining the feasibility of the alternatives presented (with confidential information redacted, if necessary). If any of the requested information is sensitive material, staff would support a request that the filing be treated as confidential.

Response:

Southern California Edison's (SCE) Forecasted Initial Operation Date for the Project is included in the recent CPUC Advice Letter 2339-E-C, which includes the following table concerning Rio Mesa I (Solar Partners XVI) and RMS II (Solar Partners XVII):

A table summarizing the BSE Amended & Restated PPSAs is as follows:

Project	Generation Type	Initial Size	Estimated Annual Energy	Forecasted Initial Operation Date	Term of Agreement (Years)
Solar Partners XVI	Solar Thermal, Central Tower	200 MW	573 GWh	9/30/2015	20/25
Solar Partners XVII		200 MW	573 GWh	12/31/2015	20/25
Solar Partners XVIII		200 MW	733 GWh	12/31/2016	20/25
Solar Partners XIX		200 MW	733 GWh	12/31/2016	20/25
Solar Partners XX		200 MW	733 GWh	3/31/2017	20/25

Excerpts from the Power Purchase Agreements that are pertinent to this Data Response have been submitted separately under Confidential Cover to the CEC.

Data Request

26. Please provide information as to why there is a difference in what is presented in the SCE Advice Letter as "Rio Mesa Solar Projects" consisting of two 200 MW components and what is presented in the AFC as Rio Mesa I, II, and III consisting of three 250 MW components.

Response:

BrightSource Energy intends to comply with the provisions within the two PPAs that relate to Rio Mesa Solar: (RMS I and RMS II). BrightSource intends to utilize RMS III to comply with similar provisions within another existing PPA.

All PPAs contain similar provisions, and excerpts from the Power Purchase Agreements that are pertinent to this Data Response have been submitted separately under Confidential Cover to the CEC.

Data Request

27. If the PPA contains the projects identified as Solar Partners XVI and XVII for two 200 MW projects, please explain how this precludes a decreased footprint alternative for the proposed project.

Response:

Excerpts from the Power Purchase Agreements that are pertinent to this Data Response have been submitted separately under Confidential Cover to the CEC.

Land Use (Nos. 28-31)

Data Request

28. Please indicate whether applicant intends to submit to Riverside County a real property interest agreement, and if so, please provide staff with the status and a schedule as to when the will be submitted and the expected date it will be finalized with Riverside County.

Response:

Applicant has reviewed Board Policy B-29 and expects to submit to Riverside County a real property interest agreement on behalf of Rio Mesa Solar III, LLC. The triggering action will be the acquisition of a quarter section of County land through purchase or lease that will reside entirely within the solar field footprint of the Rio Mesa Solar III project. The County earlier provided Applicant access to the property in order to perform environmental biological, cultural, and paleontological surveys. This data has been submitted to the CEC for review.

Timing of the submittal of the agreement with the County on behalf of Rio Mesa Solar III, LLC would be commensurate or after the execution of an agreement to lease or purchase the quarter section of land. County is expected to issue an RFP for the parcel shortly. However, Applicant cannot comment as to the exact timing of the RFP and the length of the review process contemplated by County as that is under the sole control of Riverside County EDA Staff. In response to a lawsuit filed by the Large Solar Association (LSA) and Independent Energy Producers Association (IEPA), Riverside County Counsel issued an order that all County employees are currently prohibited from speaking with members of these organizations in particular and the solar industry in general. Applicant is not a party to the lawsuit nor is it involved in the suit in any way including funding. However, County Counsel's order of no communication has extended to include Applicant.

With respect to Rio Mesa Solar I, LLC, and Rio Mesa Solar II, LLC, Applicant believes there are no actions required by the County that would require Applicant to enter into an agreement as per the conditions in Board Policy B-29.

Data Request

29. Please provide the number of acres for the farmlands listed above that is currently being farmed within the proposed project site; of these acres, please provide the number of acres that will be permanently taken out of production by construction and operation of the proposed project.

Response:

As indicated in Section 5.6.4.2, page 5.6-30 of the AFC, there is no farmland currently being farmed on the project site. No active farmland will be permanently taken out of production by construction or operation of the proposed project as currently designed.

Data Request

30. *Of the farmlands listed above that are within the right-of-way for the transmission line, please provide the number of acres that are currently being farmed; of these acres, please provide the number of acres that will be permanently and temporarily taken out of production by the proposed project's transmission lines.*

Response:

As indicated in Section 5.6.4.2, page 5.6-30 of the AFC, there is no farmland within the transmission line ROW currently being farmed. No active farmland will be permanently taken out of production by construction or operation of the proposed transmission line as currently designed.

Data Request

31. *Of the farmlands listed above that are within the right-of-way for the project's gas lines, please provide the number of acres that are currently being farmed; of these acres, please provide the number of acres that will be permanently and temporarily taken out of production by the proposed project's gas lines.*

Response:

The project gas lines will be located within the project site. As indicated in Data Response 29, there is no farmland currently being farmed on the project site (inclusive of the gas lines). No active farmland will be permanently taken out of production by construction or operation of the proposed project as currently designed.

Socioeconomics (Nos. 32-33)

Data Request

32. Please provide the contact information for those individuals or groups that provided data for the survey.

Response:

Bechtel Power Engineering prepared the survey.

Data Request

33. Please provide staff a copy of the survey.

Response:

Excerpts of the Rio Mesa Solar Electric Generating Facility Construction Craft Resources Survey, prepared by Bechtel Power Engineering, are provided as Attachment DR 33-1.

Traffic and Transportation (Nos. 34-36)

Data Request

34. Please work with the responsible agencies listed above to determine the most feasible access roads, and then provide a map to Energy Commission staff confirming the locations of the proposed primary and secondary access roads.

Response:

Applicant's AFC identified land along the extension of 34th Avenue as the project's primary access point. Secondary access would be from Bradshaw Trail. Applicant has identified two routes for workers and equipment suppliers to access these to final access approaches to the facility: Interstate 10 to Hwy 78 South to 28th Avenue West and Interstate 10 to South Lovekin Boulevard to 28th Avenue West (see Attachment DR 34-1). These two approaches reduce potential traffic impacts on the community of Ripley which is on Hwy 78 north of 28th Avenue. In addition, in the Alternatives section of the AFC (Section 6.6) several alternative access routes were analyzed. These include 22nd Avenue via State Route 78, and Mesa Drive via Interstate 10. The Applicant will continue to work collaboratively with both the Fire Department and Riverside County Transportation Department throughout the process on any concerns over access.

Data Request

35. For each solar tower, please submit Form 7460-1 "Notice of Proposed Construction or Alteration" to the FAA, and provide a copy of the submittal to staff.

Response:

Copies of Form 7460-1 for each solar tower are provided in Attachment DR 35-1, Attachment DR 35-2, and Attachment DR 35-3.

Data Request

36. Once the FAA has completed review of the proposed towers, please provide a copy of the findings to staff.

Response:

Copies of the FAA determinations for each solar tower are provided in Attachment DR 36-1, Attachment DR 36-2, and Attachment DR 36-3.

Transmission System Engineering (Nos. 37-40)

Data Request

37. *Provide the California ISO Phase II Interconnection Study of the proposed 750 MW Rio Mesa SEGF to the California ISO control grid. The Study should analyze the system impacts with and without the project during peak and off-peak system conditions, and demonstrate conformance or non-conformance with the utility reliability and planning criteria with the following provisions:*

    a. *Identify major assumptions in the base cases including imports to the system, major generation and load changes in the system and queue generation.*

    b. *Analyze the system for N-O, important N-1 and critical N-2 contingency conditions and provide a list of criteria violations in a table showing the loadings before and after adding the new generation.*

    c. *Analyze Short circuit duties.*

    d. *Analyze system for Transient Stability and Post-transient voltage conditions under critical N-1 and N-2 contingencies, and provide related plots, switching data and a list for voltage violations in the studies.*

    e. *Provide a list of contingencies evaluated for each study.*

    f. *List mitigation measures considered and those selected for all criteria violations.*

    g. *Provide electronic copies of *.sav and *.drw PSLF files.*

    h. *Provide power flow diagrams (MW, % loading & P. U. voltage) for base cases with and without the project. Power flow diagrams must also be provided for all N-O, N-1 and N-2 studies where overloads or voltage violations appear. Provide the pre and post project diagrams only for an element's largest overload.*

Response:

The Rio Mesa Solar (RMS) Project resides in Queue Cluster 3 (QC3) with the California Independent System Operator (CAISO). The project is considered in the QC3 studies under its former name Palo Verde Mesa. CAISO issued the QC3 Phase I study on May 27, 2011, and the QC4 Phase I study was issued on January 5, 2012. Of note is that the CAISO elected to combine QC3 and QC4 projects for analysis in the Phase II study process. The current planned release of the Phase II study report for QC3 and QC4 combined is around November 2012. Staff's list of specific deliverables will be available within the Phase II report when issued.

In addition the CAISO has been holding workshops, which culminated in a Technical Bulletin entitled, "Generator Interconnection Procedures: Deliverability Requirements for Clusters 1-4".[5] The Technical Bulletin was released on January 31, 2012, Revised February 2, 2012 and among other things, alters the way with which the CAISO would determine the Deliverability Network Upgrades (DNU) realistically needed to support a reasonable amount of generation in QC1 through QC4. This approach for QC1 and QC2 starts with QC1 and QC2 Phase II study results and removes a number of DNUs with high cost estimates and long lead times; and then determines the amount of QC1 and QC2 generation this reduced set of DNUs can support. This approach has substantially reduced the total number of DNUs identified in Phase II study of QC1 and QC2. The Technical Bulletin also provides for following this same approach for generation projects in the QC3 and QC4 Phase II study. By using this approach, the total number of DNUs for generation projects in QC3 and QC4 is projected to drop substantially.

With respect to Rio Mesa, the project, of the eight originally analyzed generation projects in the QC3 Phase I Study in the Eastern Bulk System Planning Area, only Rio Mesa remains in QC3 with its Point of Interconnection (POI) at Colorado River Substation. This dropout rate of projects proceeding from the Phase I to the Phase II study process is typical, and dropouts from the QC4 Phase I Study are expected prior to undertaking the combined QC3/QC4 Phase II Study process.

While Applicant is sensitive to the CEC's desire to tag particular system upgrades to a particular project, with the cluster system study currently employed by the CAISO, a direct connection can seldom be made from a single, specific project to a single specific system upgrade. Applicant is willing to work with CEC Staff to explain the process going forward and the likely ramifications of implementation of the Technical Bulletin.

Data Request

38. Provide a detailed one-line diagram for the Colorado River Substation before the interconnection of the project.

Response:

Applicant has requested this information from SCE and has been informed that this information is typically not available to generators who are not yet assigned a tentative interconnect position at the Colorado River Substation (CRS). Applicant is in the process of negotiating a preliminary engineering letter agreement with SCE, after which SCE engineers will be able to provide the requested information. Applicant will provide the requested information as soon as it becomes available.

Data Request

39. Provide a detailed one-line diagram for the Colorado River Substation after addition of the project.

- *Show bay arrangement and the necessary protection equipment required to interconnect the project.*

[5] http://www.caiso.com/Documents/TechnicalBulletin-GeneratorInterconnectionProcedures-DeliverabilityRequirements-Clusters1-4Jan31_2012.pdf

- *Provide ratings of the breakers, disconnect switches, relays, buses, etc.*

Response:

Applicant has requested this information from SCE and has been informed that this information will not be available until the Generator Interconnect Process (GIP) process is in its final stages. Applicant's Interconnection Request is now entering the Phase II study and the Large Generator Interconnection Agreement (LGIA) has not yet been executed. Thus, the one-line diagram and any required special protection scheme(s) have not yet been determined and developed. See Attachment DR 39-1 for a preliminary layout of the CRS and preliminary schematic diagram showing transmission and gen-tie lines connecting to the CRS. These figures are the only pertinent information currently available in the public domain. Applicant will provide the requested information when it becomes available.

Data Request

40. Provide the pole configuration and the number of poles that would be required for the overhead generator-tie lines.

Response:

Applicant has recently identified some discrepancies between the BLM and SCE records in the location of existing and planned SCE transmission line Rights-of-Way (ROW) in the project area that may result in the offset of a portion of the proposed gen-tie route. Applicant is working with both SCE and BLM to resolve these issues. Once resolved, the initial proposed route and pole location described in the AFC may shift to the north in order to comply with BLM guidelines and Riverside County Board Policy B-29, which both encourage consolidation of transmission lines within defined corridors.

Please see Figure 3.3-2 in Section 3 of the AFC for the proposed pole configuration. Applicant will provide CEC with engineering drawings showing the revised route and pole locations as soon as the ROW issues are resolved and the new design is available.

Waste Management (Nos. 41-42)

Data Request

41. Please explain whose responsibility it will be to dispose of waste from illegal dumping that is located on the project site and laydown areas.

Response:

Some wastes will be removed from the property by the Applicant (working with the property owner(s)) prior to construction activities. Any waste that has not been removed will be removed during mobilization and construction prior to activities in the area of the waste.

Data Request

42. Please explain how and when the waste will be disposed of if it is the responsibility of the landowner/lessee.

Response:

As described on Page 5.14-13 of the AFC, solid waste generated from construction activities will include scrap wood, steel, glass, plastic, paper, calcium silicate insulation, mineral wood insulation, scrap metals, waste oil filters, broken tools, parts and electrical and electronic components, construction equipment maintenance equipment, and empty non-hazardous containers. The project may also generate waste from the abandonment of onsite water wells. Table 5.14-3 on Page 5.14-14 of the AFC also describes historic dumping on project site (e.g. automobile bodies discarded along existing roads and washes, rusty cans, broken glass, tires and metal, debris)as a construction waste stream. These wastes will be segregated, where practical, for C&D recycling. Non-recyclable wastes will be placed in covered dumpsters and removed on a regular basis by a licensed waste-handling contractor for disposal at a Class III landfill. Existing non-hazardous solid waste disposal facilities in the area near the project site are listed in Table 5.14-2 (Page 5.14-11 and 5.14-12) of the AFC. Non-hazardous waste generated during construction phases at the Project site is not expected to significantly impact already available landfill capacity. Hazardous wastes generated during facility construction will be handled and disposed of in accordance with applicable LORS. Hazardous wastes will be either recycled or disposed of in a licensed Class I disposal facility, as appropriate. Hazardous waste generated at the project site during construction will be transported off site for recycling or disposal by a permitted hazardous waste transporter to a permitted treatment, storage, and disposal facility or Class I landfill. Two active Class I landfills are located in California: Clean Harbors' Buttonwillow Landfill in Kern County and Chemical Waste Management's Kettleman Hills Landfill in Kings County. The permitted, operating, and remaining capacities of these landfills are described in Table 5.14-2 (Page 5.14-11 and 5.14-12) of the AFC. Hazardous waste generated during construction at the project site is not expected to significantly impact already available landfill capacity. The project will comply with federal, state and local statutes and regulations related to solid waste. Impacts associated with the non-hazardous and hazardous waste management during the construction phase would not be significant.

Worker Safety and Fire Protection (No. 43)

Data Request

43. Please provide a letter, email, or record of conversation with RCFD that confirms the absence of any expected impacts on the local fire district resulting from construction and operation of the proposed project.

Or, in the absence of such letter or communication, please provide a Fire and Emergency Services Risk Assessment and a Fire Protection and Emergency Services Needs Assessment for the construction and operation of the project that provides an objective estimate of both equipment and staffing shortfalls (if any) and the associated recommended mitigations (if any) that would be required by RCFD to maintain its current level of readiness to respond to the public.

The Fire and Emergency Services Risk Assessment and a Fire Protection and Emergency Services Needs Assessment should be considerate of the guidance provided by NFPA 1710: Standard for the Organization and Deployment of Fire Suppression Operations. Emergency Medical Operations. and Special Operations to the Public by Career Fire Departments and by NFPA 551: Guide for the Evaluation of Fire Risk Assessments. The Fire Protection and Emergency Services Needs Assessment should address emergency fire and medical response and equipment, staffing. and location needs while the Risk Assessment should be used to establish the risk (chances) of significant impacts occurring. The Fire Protection and Emergency Services Needs Assessment and Risk Assessment should evaluate the following: (a) the risk of impact on the local population that could result from potential unmitigated impacts on local fire protection and emergency services (Le. "drawdown" of emergency response resources, extended response times, etc.) and (b) recommend an amount of funding that should be provided and used to mitigate any identified impacts on local fire protection and emergency medical response services.

Response:

Data Request 43 requests a letter, email, or record of conversation with the Riverside County Fire Department that confirms the absence of any expected impacts on the local fire district resulting from construction and operation of the proposed project. In the absence of such communication, Staff requests that the Applicant provide a Fire Protection and Emergency Services Needs Assessment ("Assessment").

Applicant is currently in the process of preparing the Assessment that will be responsive to this Data Request. Due to the scope of the Assessment and need for coordination with Riverside County, Applicant will require more time to prepare the Assessment.

On February 27, 2012 and pursuant to Title 20, California Code of Regulations, Section 1716(f), Applicant provided notice of its need for additional time to respond to Data 43. Applicant will respond to this Data Request as soon as the Assessment is completed, which will be no later than April 15, 2012.

In addition, Applicant wishes to bring to Staff's attention that on February 6, 2012, a lawsuit challenging provisions in Riverside County's Board Policy B-29 was filed with the County by the Large Solar

Association (LSA) and the Independent Energy Producers Association (IEPA) on behalf of certain members of each organization. Applicant is not a party to the lawsuit, nor is it funding the lawsuit. However, Riverside County Counsel directed all County employees, including Riverside County Fire Department Staff, to not speak with members of the two industry organizations in particular, and the solar industry in general. Applicant has made repeated attempts to contact individuals within the County with which it needs to coordinate, has appealed to the County Counsel's office, and the District 4 Supervisor's office. All calls and emails have gone unanswered. Applicant will continue to endeavor to work with the County, but until such time as the County changes its policy of no communication, Applicant will be unable to perform the required coordination with Riverside County Fire.

Biological Resources (Nos. 44-84)

Data Request

*Note: CEC staff revised Data Request 44 on February 27, 2012. Revisions made to Data Request 44 are shown below in ~~strikethrough~~ for deleted text and underline **bold for new text**.*

44. Please provide quarterly results of the migratory bird surveys to the Energy Commission, BLM, USFWS, and CDFG within two weeks of their completion. The survey report should include a detailed description of the methodology; list of surveyors and their qualifications (pre-approval of surveyors by the agencies is recommended); time, date, and weather conditions during surveys; and species observed, including abundance, locations of flying birds relative to proposed project area, flight direction, and estimates of flight altitude. Submittals of interim survey results to Energy Commission staff, BLM, USFWS, and CDFG and will be evaluated by the agencies as received.

For passerine bird species, we request qualified biologists monitor migration trends during the fall/winter/spring migration period using the following methodology:

- *From late July to ~~April~~ **the end of May**, weekly surveys should be conducted within the project area and four miles of the project footprint, emphasizing the area between the project site and agricultural lands to the east (between the site and the Colorado River). If there are access restrictions preventing establishment of surveys points in the agricultural lands within four miles east of the proposed project area, please document the efforts taken to gain access and landowner responses. If access is not granted, please conduct surveys within the project area and at least one mile of the project area.*

- *Qualified biologists should be stationed at 5 to 10 migration count locations throughout the site and scan the sky and record bird use and movement data (species, number, direction traveled, height traveled, etc.). The REAT agencies agree with the locations of the seven proposed bird observation points illustrated on Figure 1 of the applicant's January counterproposal, so long as they provide a wide expanse of observation area from a single point and were identified by qualified biologists. Observations should occur for at least 8 hours per day under good weather conditions (i.e., no sustained precipitation or fog and incorporate both dawn and dusk hours), encompassing midday hours (i.e., at least dawn to late afternoon for passerine), for 3 consecutive days per week. A fourth day of survey each week, where qualified biologists collect avian point count data using a Breeding Bird Survey route developed by the project proponent, line transect, or comparable technique (see Bibby et al. 2000) is also recommended unless otherwise stated by the REAT agencies pending review of 2011 BLM point count methods and results, as requested in data request No. 50, below. Energy Commission staff have no recommended changes to the applicant's proposal to use the same 16 line transects that were used in 2011; staff assumes these were selected by a qualified biologist.*

- *Spring and fall nocturnal migration pulses of avifauna (and bats) should be characterized for the project area. Radar ornithology data, using methods such as those described by Gauthreaux and Belser (2005), adapted as appropriate to the project area, should be used to obtain these data.*

Staff recommends that the applicant work with a recognized expert to develop site specific methods.

For raptor species, we recommend qualified biologists monitor migration trends during the fall/winter/spring migration using the following methodology based on Hawk Migration Association of North America (HMANA) standard field survey techniques which were modeled after Cape May Raptor observation methods, now standard for hawk migration counts (Bildstein 2006, Bildstein et al. 2007, HMANA 2010a, HMANA 2010b):

- *From August to April, weekly surveys should be conducted using unlimited distance bird migration survey methods. Qualified biologists should be stationed at a minimum of three observation points, at least 2 miles apart, within four miles of the project footprint. If there are access restrictions preventing establishment of surveys points within 4 miles east of the proposed project area, please document the efforts taken to gain access and landowner responses. If access is not granted, please conduct surveys within the project area and at least one mile of the project area.*

- *Raptor observation points must fit the following criteria: (1) allow wide expanse of observation area from a single point, (2) be away from public view, and (3) afford a location where topographic and biological features are likely to be used by raptors during migration. At least one qualified biologist should lead observations at each observation points for at least four consecutive days per week. Observations should be conducted under good weather conditions (i.e., no sustained precipitation or fog) for a period of at . least 8 hours, encompassing midday hours (i.e., at least 9 a.m. through at least 5 p.m. for raptors) when most species are likely to be migrating or conducting daily movements.*

Response:

On February 27, 2012, Applicant objected to this data request, but provides the following response without waiving its objection.

Quarterly results of the migratory bird surveys will be submitted to the CEC, BLM, USFWS, and CDFG within two weeks of their completion. These surveys began on February 21, 2012 for passerine, upland, and waterfowl at the four approved observation points staffed by biologists who are qualified to conduct passerine surveys. Resumes for biologists who are qualified to conduct both raptor and passerine surveys were submitted to BLM and USFWS on February 22, 2012. BLM sent immediate concurrence with all resumes submitted. Surveys will begin at the three remaining observation points with biologists that are qualified to conduct both raptor and passerine surveys as soon as we receive approval on the resumes from FWS.

Data Request

45. *Please provide results of the breeding bird and Gila woodpecker surveys to the Energy Commission, BLM, USFWS, and COFG as soon as possible after their completion. The survey report should include a detailed description of the methodology; list of surveyors and their qualifications (pre-approval of surveyors by the agencies is recommended); time, date, and weather conditions during*

surveys; and species observed, including abundance, age class of individuals, numbers of nesting pairs or territories documented for each species, breeding success if known for each pair/territory, incidental observations of other species observed but no breeding/nesting behavior noted.

The REAT agencies request that the applicant conduct focused surveys during the breeding season (March to May), to determine distribution and abundance of avifauna, including Gila woodpecker, in the microphyll woodlands and adjacent to the project footprint (within one mile) using the following methodology:

- *Conduct absolute counts by qualified3 biologists using line-transect or comparable technique (Bibby et al. 2000). At least eight full coverage surveys beginning in early March and continuing on 8-10 day intervals through early May.*

- *Surveys should provide complete coverage of the microphyll woodland in the project area and within a one mile buffer.*

- *All observations of bird species should be documented along with information regarding presence of a nest or exhibition of nesting behavior to ultimately provide an absolute count of Gila*

Response:

On February 27, 2012, Applicant objected to this data request, but provides the following response without waiving its objection.

Results of breeding bird and Gila woodpecker surveys will be submitted to the CEC, BLM, USFWS, and CDFG as soon as possible after their completion. However, Applicant disagrees with both the number of surveys required and the survey area being requested. There is no established survey protocol for this species. The REAT agencies' request for at least eight full coverage surveys beginning in early March and continuing on 8-10 day intervals through early May is based on established protocol for much less conspicuous species (least Bell's vireo and southwestern willow flycatcher), which are both relatively small, blandly-colored bird species typically inhabiting dense riparian areas. In contrast, Gila woodpecker is a much more conspicuous species, being larger, distinctly colored, and having an obvious call. Additionally, microphyll woodland habitat onsite is somewhat sparse, with large open areas between individual ironwood and blue palo verde trees. Gila woodpecker present onsite are easily identified in this habitat. Additionally, surveying a one mile buffer from the project site is unnecessary. During biological resources surveys for other species, a 500 foot buffer from the project fenceline was considered sufficient. Therefore, we will conduct full coverage surveys within all microphyll woodland habitat within the project fenceline and a 500 foot buffer. We will conduct three full coverage surveys, one in the beginning of March, one at the end of March/early April, and one at the end of April/early May, using line-transect techniques. This level of effort and data collection is sufficient to support California Endangered Species Act permitting.

Data Request

46. *Please conduct additional aerial and/or ground surveys for golden eagles within a 10-mile radius of the proposed project area according to Interim Golden Eagle Inventory and Monitoring Protocols and other Recommendations (Pagel et al. 2010). Objectives of the survey are to:*

    - *Record and report occupancy and productivity of local golden eagle territories;*
    - *Document and list historical and unsurveyed habitat for future analysis to assist in determining local and regional population trajectories;*
    - *Determine nesting chronologies;*
    - *Provide information to document whether local golden eagle conservation efforts meet permit conditions or goals for improvements in the status of golden eagles;*
    - *Provide a foundation to evaluate whether and which proposed activities or conditions may be affecting golden eagles; and*
    - *Document foraging behavior, diet, and habitat use within breeding and nonbreeding home ranges.*

    To achieve these survey objectives, data collected shall include:

    - *Breeding season inventory and monitoring surveys timed early enough to note courtship and nest defense;*
    - *Breeding season monitoring to determine occupancy and reproductive success at territories;*
    - *Presence estimation (abundance, distribution, and duration) of juveniles, subadults, and floaters within and near the project footprint (within a 10-mile survey radius);*
    - *Unlimited distance point counts/long-sit observations to determine/estimate eagle presence;*
    - *Carcass placement with fixed cameras;*
    - *Non-breeding season surveys (migration and wintering) conducted using Hawk Migration Association of North America (HMANA) protocol surveys and unlimited distance long-sit point counts; and*
    - *Prey base evaluation.*

    Golden eagle surveys shall be designed by a qualified raptor biologist. The REAT agencies cannot tell the applicant whom to hire for surveys. For additional detail on required survey methodology and raptor biologist qualifications, refer to the USFWS memorandum regarding golden eagle survey clarification dated January 31, 2011.

Response:

Additional aerial and/or ground surveys for golden eagles within a 10-mile radius of the Rio Mesa project site will be conducted in 2012 by Bloom Biological, Inc.

Data Request

47. Please provide results of the surveys as a Supplement to the Phase II Golden Eagle Report for the Rio Mesa Project within 2 weeks of finishing the surveys. The survey report should be consistent with the requirements of Pagel et al. 2010. Submit interim survey results to the Energy Commission staff, BLM, USFWS, and CDFG.

Response:

Results of additional aerial and/or ground surveys for golden eagles will be provided as a Supplement to the Phase II Golden Eagle Report for the Rio Mesa Project within 30 days of completion.

Data Request

48. At the conclusion of eagle surveys, please prepare and submit a draft Eagle Conservation Plan to Energy Commission staff and BLM, and provide copies concurrently to the USFWS for review.

Response:

A draft Eagle Conservation Plan will be prepared and submitted to CEC staff, BLM, and USFWS once eagle surveys are complete. Applicant requests that a template or detailed outline of an Eagle Conservation Plan that the REAT agencies consider acceptable be provided within 30 days of this Data Response submittal.

Data Request

49. Please conduct focused nocturnal elf owl surveys throughout the microphyll woodland in the project area and within one mile using line transects or comparable technique with recorded calls (play-back method). Survey methods should generally be based on the breeding season methods approved by Arizona Game and Fish Department for a similar species, cactus ferruginous pygmy-owl (AGFD 2000). That protocol requires three repeated site visits during the breeding season. The specific number of repeated surveys should be at least three, and should be developed by qualified ornithologists to maximize likelihood of detecting the species if it is present. The survey dates should be based on the species' behavi9r patterns and detectability (i.e., response to the recording), considering available records of nesting activity and timing in the low desert region. Survey results should provide absolute counts of the number of elf owls in the study area. All incidental observations of other nocturnal species, including long-eared owl, if detected, should also be recorded.

Please provide results of the elf owl surveys to the Energy Commission staff, BLM, USFWS, and CDFG within two weeks of their completion. The survey report should include a detailed description of the methodology; list of surveyors and their qualifications (pre-approval of surveyors by the agencies is recommended); time, date, and weather conditions during surveys; and individuals

observed, including abundance, age class of individuals, numbers of nesting pairs or territories documented for each species, breeding success if known for each pair/territory, incidental observations of other species observed but no breeding/nesting behavior noted.

Response:

On February 27, 2012, Applicant objected to this data request, but provides the following response without waiving its objection.

The literature on the nesting preference of elf owl is well established and the desert wash woodlands present on the Rio Mesa site are not suitable for elf owl. In the Lower Colorado River Valley (LCRV), elf owls inhabit cottonwood-willow stands and tall mesquite groves with remnant cottonwood or willow snags (LCR MSCP 2004, CDFG 2005). Less than 800 acres of suitable elf owl habitat is present within Reach 4 of the LCR MSCP planning area (LCR MSCP 2004). The substantial evidence already provided to the CEC indicates that elf owl is not expected to occur on the Rio Mesa site due to a lack of suitable habitat and the absence of known occupied habitat within 13 miles of the site. Based on past elf owl surveys sponsored by CDFG, elf owl surveys within the vicinity of the Rio Mesa site are not warranted. No incidental take of elf owl (as defined by CFGC 86) is expected. The verbal reporting of elf owl using Wiley's Well campground was a 1976 sighting and has not been confirmed since that year.

A review of the aerial photo of the Wiley's Well campground site mentioned in the personal communication to the CEC shows dense windrow-like clusters of tall palo verde trees along the drainage channels (see Attachment DR 49-1). Ground-level photos of the drainage channels further illustrate the size and density of these clusters (see Attachment DR 49-2). A similar review of Corn Springs, which was also mentioned, again shows dense vegetative cover (mesquite thicket with tall palo verde trees and California fan palms). This configuration of trees is lacking at the Rio Mesa site. The trees at Rio Mesa are widely dispersed with inter-tree distances of 50+ feet being most common. Applicant identified small areas where the inter-tree distance appears to be less than 50 feet. These drainage segments amount to a total of 250 acres that could be extremely marginal habitat for elf owl.

If, after considering this data indicating that there is no likelihood of elf owl occurrence on the Rio Mesa site, the Committee determines that surveys should be required, Applicant would conduct focused surveys for elf owl in these marginal areas and in any additional areas where Gila woodpecker are detected during surveys (see Attachment DR 49-3), as elf owls are capable of utilizing abandoned woodpecker cavities. Any elf owl surveys required by the Committee would be conducted using the cactus ferruginous pygmy-owl protocol requiring three night visits and using taped vocalizations of elf owl to elicit a response.

"Species of Special Concern" is a CDFG administrative designation and carries no formal legal status. Focused surveys for species of special concern are not required by either CEQA or NEPA. Long-eared owls are an uncommon species with an extensive species range that encompasses most of California and beyond. This owl was not an assessment species for the BLM's NECO plan. Regional programs, like the BLM's NECO and WMP, have conserved substantial areas suitable for the region's Species of Special Concern, and habitat mitigation requirements for approved projects benefit these species as well.

Long-eared Owls nest mainly in old corvid or hawk nests but also nest in old woodrat and squirrel nests, mistletoe brooms, and natural platforms of (or debris piles in) trees (Hunting 2008[6]). They occasionally nest on cliffs, in tree cavities, in orchards or ornamental trees, in man-made structures, or on the ground. As for most raptors, the entire Rio Mesa site and close-by agricultural fields and river floodplain are suitable foraging habitat for long-eared owl. Any long-eared owls incidentally detected will be documented.

Data Request

50. Please provide a detailed, written report, describing all methods and results of the 2011 winter and breeding season avian point counts, including dates, times, and duration of surveys conducted, maps, tables, and summary data as applicable. Using map(s) of suitable scale, please illustrate the 16 survey transects that were surveyed for birds in 2011. Please also provide all raw data in an electronic format suitable for independent analysis by the resource agencies.

Response:

The 2011 Spring and Fall Bird Point Count Survey Report was submitted to the CEC and docketed on February 13, 2012. This report provides all methods and results of avian point counts conducted during spring and fall 2011, including dates, times, and duration of surveys, maps, tables, and summary data. A map showing all 16 survey transects is also part of the report. Applicant understands that the REAT agencies may agree that this submitted data is sufficient for weekly line transects or point counts (page 20 of the Rio Mesa Solar Electric Generating Facility (11-AFC-04) Data Requests, Set 1A. Prompt verification that these data suffice from REAT is critical.. All raw data will be provided in an electronic format suitable for independent analysis by the resource agencies.

Data Request

51. Please conduct and provide the results of one year of acoustic monitoring to provide adequate information to determine bat species present and habitat use in the proposed project area. Deploy three Anabat stations within microphyll woodland habita.t to provide maximum coverage of the project area. To provide maximum coverage of the project area, please locate the Anabat stations at the northernmost and southernmost applicant-proposed locations (in Figure 1 of the January counterproposal), but locate the third station in the microphyll woodland due east of the southernmost power tower location. Data shall be collected continuously for no less than one year. Please report findings quarterly as data responses, and copy the Energy Commission staff, BLM, CDFG, and USFWS with the information.

Response:

Anabat units were installed on February 9 and 10, 2012, and will provide one year of acoustic monitoring for bats. Three Anabat stations within three different drainages supporting microphyll woodland habitat

6 Hunting, K. 2008. Long-eared Owl (*Asio otus*). Pages 234-241 in: Shuford, W. D., and Gardali, T., editors. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

within the project fence line are collecting continuous data and are adequately spaced to provide maximum coverage of the project area. This protocol and the three Anabat locations were approved via email from Heather Blair at Aspen Environmental Group on January 25, 2012. Results from acoustic monitoring will be provided quarterly to CEC staff, BLM, CDFG, and USFWS.

Data Request

52. Please perform an assessment of bat roost habitat, including identification of suitable day roosts, hibernacula, and maternity roosts, within the project area and vicinity. Please provide an illustration that identifies suitable roost habitat by the aforementioned types on a figure with the proposed project components and areas of proposed ground disturbance or vegetation/structure removal.

Response:

The table in Attachment DR 52-1 lists those species of bats that are likely to occur in the project vicinity. Of these, only the California leaf-nosed bat (CLNB), cave myotis and pallid bat roost in the mines in the nearby Mule Mountains (see Attachment DR 52-2, Bat Habitat Map).

CLNB in the project vicinity roost in the Hodge Mine throughout the year, and use the Roosevelt Mine as their maternity roost. Since they are unable to lower their body temperatures, and are active in the winter, there are no hibernacula for CLNB in the project vicinity.

Cave myotis in the project vicinity use both the Roosevelt and Hodge mines for their diurnal roosts, and use the Hodge Mine as their maternity roost. Aside from the few active individuals sporadically present in the Californian Mine (in the Whipple Mountains south of Parker Dam), it is unknown where the majority of the California population of Cave myotis migrates to during the winter.

Pallid bats, along with all other bats known to occur in the project vicinity (excepting the CLNB and Cave myotis), roost in small crevices in rocks and the ground. These crevice roosts can be found out on flat plains or alluvial fans away from the mountains, and may be found on the project site. Maternity roosts and hibernacula for these species are mostly unknown, as they are virtually impossible to find. Acoustic monitoring performed as described in Data Request 51 will provide the data necessary to evaluate the project site's suitability for crevice-roosting bat species.

The entire project vicinity has some potential for crevice-roosting bat habitat: for example, even desert pavement areas can have crevices where small bats could roost. It is not practical to map specific areas of potential crevice-roosting areas, as it is most of the project site and vicinity.

Data Request

53. Provide a description of movement patterns of bats between roost sites in the vicinity of the project and foraging habitat within the project area, including a map depicting suitable roosts and foraging habitat. Also, provide an assessment of the project's impacts to these movement patterns for special-status bats.

Response:

The bats in the project vicinity may forage in the microphyll woodland between the roosts in the Mule Mountains and the agricultural fields in the Lower Colorado River Valley. The foraging area for CLNB typically extends 1 to 3 miles from their roost, though often a shorter distance during colder months, when they forage closer to their roosts and are above ground for shorter periods. Cave myotis likely forage in microphyll woodland, as well as in riparian habitat near the Lower Colorado River, and may travel even as far as the Cibola National Wildlife Refuge. Pallid bats and other crevice-roosting bats in the project vicinity likely forage in microphyll woodland near their roosts. Approximately 23.4 percent of the microphyll woodland habitat within 3 miles of the two mine roost sites is included within the Project fence line (see Attachment DR 52-2), and the majority of the potential woodland habitat associated with the project is greater than two miles from the mine roost sites. The proposed project will reduce or modify potential foraging habitat for common bat species. Some bat foraging habitat will be retained onsite between the rows of heliostats and may be used by foraging bats. Bats colliding with static (non-moving) structures are likely to be minimal for most bat species that use echolocation. California leaf-nosed bats can use both echolocation and vision while foraging low to the ground, especially under moon-light conditions. Previous studies have documented bats colliding with static man-made structures (buildings, communication towers), but generally the number of bat mortalities involved are limited to a few to several tens of individuals cumulatively over several years of monitoring at the structures (Johnson and Strickland 2003 [7]). Night-time lighting that is hooded downward would minimize avoidance behavior of foraging bats. As can be seen on the map, there are alternate routes for bat movements around the project vicinity to access the Cibola National Wildlife Refuge and the Colorado River.

Data Request

54. Incorporating the complete survey results for breeding, migratory, and special status birds and bats, please prepare and submit a draft Bird and Bat Conservation Strategy to Energy Commission staff and BLM, and provide copies concurrently to the USFWS for review. It is BLM's standard practice to publish this Draft Plan with the Draft Environmental Impact Statement (EIS) to provide opportunity for public review and comment.

Response:

On February 27, 2012, Applicant objected to this data request, but provides the following response without waiving its objection.

Applicant does not believe all additional REAT-recommended survey results must be completed prior to the completion of a Draft Bird and Bat Conservation Strategy. Applicant will prepare and submit a Draft Bird and Bat Conservation Strategy incorporating survey results for breeding, migratory, and special status birds and bats completed to date. The plan can be amended as additional survey results are obtained throughout 2012. Applicant will docket the Draft Bird and Bat Conservation Strategy with CEC and concurrently provide a copy to BLM and FWS.

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[7] Johnson, G.D. and M.D. Strickland. 2003. Biological Assessment for the Federally Endangered Indiana Bat (*Myotis sodalis*) and Virginia Big-eared Bat (*Corynorhinus townsendii virginianus*) NedPower Mount Storm Wind Project, Grant County, West Virginia. http://www.west-inc.com/reports/final_ned_power_bat_ba.pdf

Data Request

55. Please provide data (developed using Pro E, Solid Works or other equivalent 3D modeling package) showing expected energy flux emitted from each tower over a 24-hour period under several different weather (e.g., wind speed) scenarios. Translate this energy flux into expected increases in ambient temperature applied to a body located between the receiver, standby points/ring, and heliostats as well as changes in light and humidity between these locations. Based on 1-hour intervals, state the temperature applied to a body, humidity, and light at the top of the tower, and extending outward at reasonable, regularly occurring heights and distances. Please provide staff both a model and to-scale renderings shown in top down and side view.

Response:

On February 27, 2012, Applicant objected to this data request, but provides the following response without waiving its objection.

In reference to Staff's question concerning flux being emitted from the towers, only the SRSG on top of the tower emits any energy. The SRSG on top of the tower is designed to absorb the maximum amount of energy, and accordingly, only a very small fraction of the flux that is concentrated on the SRSG is reflected back into the environment. The reflected light is quickly dispersed similar to an incandescent light bulb, where the intensity of the light is inversely proportional to the square of the distance from the observer.

There is an elevated temperature zone very close to the SRSG surface that is created by natural convection where the air that is actually touching the hot surface of the SRSG is heated.

To address Staff's concern about the elevated temperature zones near the SRSG, Applicant will submit a report that quantifies this localized zone of elevated temperatures based on a Computational Fluid Dynamics (CFD) model for Staff to review. These results will permit Staff to evaluate risks to avifauna due to the fractional amount of radiant energy that is not absorbed by the SRSG.

Data Request

56. Please provide an analysis of the impacts to desert dry wash woodland and other vegetation in the project area from reflected/concentrated solar energy flux and the potential resultant changes in light, heat, and humidity.

Response:

The solar energy flux reflected by the heliostats will not have a measurable effect on ambient light conditions, temperature, or humidity at ground level for several reasons. First, the amount of flux reflected by each individual heliostat is minimal. Second, while particulate matter (e.g., dust) in the air may absorb a tiny fraction of the reflected flux, the amount of heat generated would be negligible. Third, the vast majority of the energy reflected by the solar field reaches and is absorbed by the solar receiver steam generator (SRSG), 577 feet or more above the ground. Therefore, because concentration of flux

will only occur at this height, changes to ground-level conditions and resultant impacts to microphyll woodland and other vegetation in the project area are not expected.

Data Request

57. From the applicant's presentation at the January 6,2012 public workshop, please provide the following pertaining to energy flux modeling and computations:

a. raw data used for input to the model;

b. boundary conditions and model parameters;

c. output files of the model runs and detailed computations;

d. an electronic copy of the model or web link to download in order to run the model and verify its findings; and

e. any publications pertinent to the development of the model or conclusions reached using its output.

Response:

Per Applicant's Notice for CEC Staff's Data Requests Set 1A, filed February 27, 2012, Applicant objects to Data Request 57. Without waiving this objection, Applicant reserves the right to provide and will endeavor to provide a response to Data Request 57, in whole or in part. Should Applicant respond to this request, Applicant will require more time to prepare the requested modeling and may provide the results under confidential cover on or before April 15, 2012.

Data Request

58. Using the complete year of survey data requested in Data Requests 44 - 47, please conduct and provide a risk assessment for birds and bats that addresses the following questions:

a. What are the predicted fatality rates for each species or species group over the life of the project? Please provide predicted fatality rates for each special status species potentially occurring in the area, as well as for larger categories or species groups including, but not limited to waterfowl, shorebirds, passerines, and raptors.

b. How do the seasonal variation and weather conditions impact these fatality rates?

c. How do the fatality rates compare between breeding and non-breeding seasons?

d. What is the degree of accuracy in the predicted fatality rates?

Please show detailed computations with case examples in responding to each of these questions.

Response:

On February 27, 2012, Applicant objected to this data request, but provides the following response without waiving its objection.

The Applicant does not believe that all additional REAT-recommended survey results must be completed prior to the completion of a Draft Risk Assessment.

The Applicant is currently preparing a Draft Risk Characterization Study to help better explain Applicant's technology as well as the perceived risk to birds and bats. The plan can be amended as additional survey results are obtained throughout 2012. The Applicant will docket the Draft Study with the CEC and concurrently provide a copy to BLM, FWS, and CDFG.

Data Request

59. Please provide a description of the safety requirements for workers at active power tower facilities, including personal protective equipment, safety distances, and temporal and spatial restrictions.

Response:

Applicant is in the process of updating a comprehensive Injury and Illness Prevention Program (IIPP) and creating a Site Safety Plan (SSP) for the Ivanpah Solar Electric Generating Facility. These documents will serve as the basis for preparation of draft plans for the Rio Mesa project; drafts of these documents can be found in Attachment DR 59-1 and Attachment 59-2, respectively.

Data Request

60. Please provide a draft Desert Tortoise Translocation Plan that incorporates the most recent guidance from the BLM, USFWS, and CDFG. Please discuss the rationale for not avoiding occupied habitats, translocation procedures and guidance in the plan, including a description of clearance survey protocol and desert tortoise transportation and release procedures, and develop a long-term post-translocation monitoring and reporting plan. All methods discussed in the plan must be consistent with the most recent guidance provided by the USFWS.

The translocation plan shall include, but shall not be limited to, the following information, which must be consistent with the most recent guidance provided by the USFWS as well as BLM and CDFG regulations:

- *Rationale for need to perform translocation;*
- *Identification of potential translocation sites based first on resident desert tortoise densities (i.e., sites with depleted populations should be selected first), then on the presence of suitable soils, vegetation community, vegetation density and abundance, perennial plant cover, forage species, geomorphology, and slope;*
- *Surveys of resident populations at proposed translocation sites to determine density and disease status, including health assessment sampling and attaching transmitters to individuals;*

- *Description of measures that would be implemented to prevent translocated desert tortoises from entering the project site or other hazardous areas;*

- *Description of quarantine facilities to provide individual quarantine for all tortoises prior to translocation;*

- *Description of health assessments that would be performed by qualified biologist or veterinarian on each tortoise prior to translocation;*

- *A treatment disposition plan for each tortoise, including those unfit for translocation;*

- *Description of translocation procedures, including timing (e.g., time of year, time of day);*

- *Description of post-translocation monitoring and adaptive management activities;*

- *Description of methods used to mark translocated tortoises and fit them with transmitters so that they can be located and identified during post translocation monitoring;*

- *Description of methods used to mark existing tortoises in the receiving population and fit them with transmitters so that they can be located and identified during post- translocation monitoring; and*

- *Description of how data would be compiled, synthesized, and reported to USFWS, CDFG, BLM, and Energy Commission staff.*

The proposed translocation site(s) must at a minimum:

- *Be sited in accordance with all agency guidelines with respect to choice of land owner and land manager;*

- *Satisfy the requirements of the federal Endangered Species Act Section 7 lead (BLM) and USFWS; and*

- *Have no proposed rights-of-way or other encumbrances at the time of its establishment.*

Response:

Applicant will prepare a Draft Biological Assessment (BA) inclusive of the Draft Desert Tortoise Translocation Plan (DTTP) (typically an appendix to the BA) and submit it to the BLM per proper protocol within 30 days. Applicant will work with the BLM to finalize both documents and will submit copies to the CEC and CDFG. Per protocol, once accepted, the BLM will formally submit the BA (inclusive of DTTP Appendix) to FWS. After a 30 day review and acceptance by FWS, the formal consultation starts the 135-day consultation period. The Draft DTTP will include elements listed in Data Request 60 and will follow current guidance and regulations.

Data Request

61. Please coordinate with BLM Renewable Energy Coordination Office to prepare and submit a BA to the USFWS per federal guidelines, available from the Palm Springs Fish and Wildlife Office. Note that federally listed bird species (e.g., southwestern willow flycatcher) may also be identified during the breeding and migratory bird surveys requested in data requests 44 - 50. These will need to be addressed in the BA, but the timing of surveys may not be conducive to providing a BA at the time of Draft EIS publication, as is BLM's standard practice. Please coordinate with USFWS and BLM regarding how to address this issue in BA preparation. Please also provide a copy of the BA to the Energy Commission staff when it is deemed complete by the USFWS.

Response:

See response to DR 60 above.

If federally-listed bird species are noted during the 2012 additional surveys, and there is a potential for the project to affect them, Applicant agrees to include these species in the BA through coordination with the BLM.

Data Request

62. Please provide a complete report describing methods and results of the desert tortoise/burrowing owl field surveys, including:

a. A complete list of all wildlife species observed during the field surveys;

b. List of field staff and field survey dates, indicating which biologists participated on each date;

c. Time, air temperature, wind speed and other relevant data for each survey date, per California Burrowing Owl Consortium (1997) and USFWS (2010) survey protocol for desert tortoises;

d. Complete descriptions of field methods, in terms of USFWS survey protocol, and Phase I, II, and III burrowing owl survey protocol;

e. Detailed description of results and all parameters recorded in the field during different phases of surveys of the burrows and sightings of Burrowing Owls and desert tortoises, including description of all desert tortoise and burrowing owl sign (include descriptions of burrows, scat, and tortoise remains by USFWS defined "classes"; description of evidence of burrowing owl activities at burrows, etc.) and maps of all desert tortoises, burrowing owls, and sign of both species;

f. A completed "Burrowing Owl Burrow Surveys" form for all survey dates (a blank example of this form is provided in Appendix E of the BRTR);

g. Copies of CNDDB field survey forms submitted to the CNDDB; and

h. Copies of the field notes/logs from surveys.

Response:

Methods for the desert tortoise surveys are provided in Section 5.2.4 of the AFC on pages 5.2-37 and 5.2-38 and in Section 3.2.2.1 of the Appendix 5.2A on pages 3-8 and 3-9.

Methods for the burrowing owl surveys are provided in Section 5.2.4 of the AFC on pages 5.2-38 and 5.2-39 and in Section 3.2.2.4 of the Appendix 5.2A on Pages 3-9 and 3-10

Results of the desert tortoise surveys are provided in Section 5.2.5.5 of the AFC on pages 5.2-50 through 5.2-52 and included in Figure 5.2-4. In Appendix 5.2A the results are presented in Section 4.2.2.1 on pages 4-8 and 4-9 and illustrated in Figures7, 8, and 9.

Results of burrowing owl surveys are provided in Section 5.2.2.5 of the AFC on page 5.2-55. In Appendix 5.2A the results are presented in section 4.2.2.7 on page 4-12.

a. A list of all wildlife species observed at the site is presented in Appendix I within Appendix 5.2A to the AFC.

b. Personnel for each days' surveys (both desert tortoise and burrowing owl) are provided in Appendix B of Appendix 5.2A to the AFC

c. The requested data will be provided within 30 days.

d. Field surveys for desert tortoise followed USFWS 2010 survey protocol,[8] and surveys for burrowing owl followed Phase I, II, and III of the 1993 CDFG/Burrowing Owl Consortium survey protocol[9] and as are summarized in Section 5.2.4 of the AFC on pages 5.2-37 and 5.2-38 and in Section 3.2.2.1 of the Appendix 5.2A on pages 3-8 and 3-9 for desert tortoise and in Section 5.2.4 of the AFC on pages 5.2-38 and 5.2-39 and in Section 3.2.2.4 of the Appendix 5.2A on Pages 3-9 and 3-10 for burrowing owl.

e. The requested data will be provided within 30 days.

f. The requested data will be provided within 30 days.

g. The requested data will be provided within 30 days.

h. The requested data will be provided within 30 days.

[8] http://www.fws.gov/ventura/species_information/protocols_guidelines/docs/dt/DT%20Pre-project%20Survey%20Protocol_2010%20Field%20Season.pdf

[9] http://www.dfg.ca.gov/wildlife/nongame/docs/boconsortium.pdf

Data Request

63. Please prepare and submit an Incidental Take Permit application to the Energy Commission staff, and provide copies concurrently to the CDFG for review. Species addressed in the application shall include, but are not limited to, desert tortoise, Gila woodpecker, and elf owl.

Response:

On February 27, 2012, Applicant objected in part to this data request, but provides the following response without waiving its objection.

Applicant will prepare an Incidental Take Permit Application for desert tortoise and the Gila woodpecker within 30 days. The Applicant will docket the permit applications with the CEC and concurrently provide copies to the CDFG for review.

If elf owls are required by the Committee and detected during the 2012 additional surveys, an Incidental Take Permit Application will be completed for this species. The Applicant will docket the permit application with the CEC and concurrently provide a copy to the CDFG for review.

Data Request

64. Pursuant to Section 1600 et seq. of the California Fish and Game Code, please submit an application for a Lake and Streambed Alteration Agreement, as well as an application fee, to the California Department of Fish and Game, and provide a copy of the application to the Energy Commission staff.

Response:

Applicant will prepare and submit an Application for a Lake and Streambed Alteration Agreement, as well as applicable fees to CDFG within 30 days if approval of the delineation of state waters is obtained from CDFG and determination of impacts is agreed. A copy of the application will be docketed with CEC.

Data Request

65. Because of the proposed project's proximity to the LCRMSCP area, please provide an analysis of the proposed project's conformance with the goals and objectives of the LCRMSCP, particularly as it relates to potential impacts to migratory birds.

Response:

- The western limits of this LCR MSCP planning area are the limits of the agricultural fields. See map at http://gis.usbr.gov/MSCP/MSCPmap.html Reach # 4.
- Goals of the MSCP do not extend to adjacent desert lands that are not within the MSCP planning areas.
- Activities covered by the MSCP are limited to actions occurring within the river and adjacent agricultural areas.

- There will be a mile-wide buffer of desert scrub habitat between the heliostat field and agricultural lands included in the MSCP planning area.
- Habitat restoration activities associated with the MSCP will benefit migratory birds and other wildlife.
- The proposed Rio Mesa project does not conflict with implementation of the MSCP.

Data Request

66. Please describe the surveys conducted for special-status small mammals within the project area. If no such surveys were conducted, please provide an explanation regarding why the surveys were not completed.

Response:

Focused surveys for special-status small mammals within the project area were not conducted, and are not required by either CEQA or NEPA. No agency concerns were raised regarding the need to conduct small mammal trapping during review of the project biology work plan. "Species of Special Concern" is a CDFG administrative designation and carries no formal legal status.

Data Request

67. Please provide an assessment of suitable habitat for special-status small mammals, including but not limited to Colorado River cotton rat and pallid San Diego pocket mouse, to occur in the project area and an explanatory rationale regarding whether these species could occur in the project area.

Response:

Both rodent species mentioned are State species of special concern. The cotton rat is limited to very wet marshy (not riparian) sites, habitat that is lacking on the project site. The nearest locations for this species are north of Blythe and south of Palo Verde in Imperial County. This species is not expected to be affected by the project.

The pallid San Diego pocket mouse is a very common species found throughout the desert. This species was not included in the 1998 draft update list for mammal species of concern and is not on the current update list being considered by CDFG.

Data Request

68. Please provide an assessment of potential impacts of the proposed project to small mammals. Include impact avoidance and minimization measures or a mitigation proposal for potentially significant impacts. These surveys also must address primary prey species of raptors, including golden eagle, such as cottontails, jackrabbits, and ground squirrels.

Response:

The cotton rat is not expected to be affected by the project due to the lack of suitable habitat onsite.

The pallid San Diego pocket mouse is likely present on the Rio Mesa site. Impacts to this species are not considered significant due to its extensive distribution and this species is not considered to be at risk due to the extensive amount of suitable habitat conserved and managed by BLM, CDFG, FWS, Bureau of Reclamation (BOR), and National Park Service in the project vicinity.

The Rio Mesa site is suitable foraging habitat for raptors, with red-tailed hawk, turkey vulture, American kestrel, and prairie falcon being the most abundant species present.

The project site boundaries have been modified to avoid and minimize impacts to desert wash woodland. Raptor foraging habitat is not considered to be a limiting factor at the regional scale of the desert region of southern California. No raptor populations are expected to be significantly impacted by the proposed project.

Data Request

69. Please define the poor, moderate, and good habitat classifications used for MFTL (AFC p. 5.2-52) and include citations articulating this' classification.

Response:

MFTL habitat was assessed by URS biologist Jeffery Jarvis who studied Mojave fringe-toed lizards for his Master's thesis at California State University Fullerton. Mr. Jarvis assessed habitat based on his knowledge and understanding of the species and its habitat requirements. He identified 4 categories of suitable habitat for MFTL: ideal, good, moderate, and poor. All other habitat within the BSA was identified as being unsuitable and did not warrant survey. There was no ideal habitat in the project footprint or tie-line corridor. Mr. Jarvis defined the habitat categories as follows:

- Ideal – Habitat is expansive, and MFTL population is large enough to avoid localized extinctions and likely serves as source population for surrounding populations with less than Ideal habitat types. Aeolian sand is continuously present around the bases of the vegetation and the surrounding open areas at a depth and consistency (grain size) suitable for MFTL burial behavior. The vegetation consists of scattered perennial plants with small patches of mostly annual vegetation scattered in the open areas between the perennials. These Ideal habitats are often associated with large non-vegetated, avalanche-faced dunes.

- Good – Same as ideal, but habitat area (or quality) or MFTL abundances are small enough to be subject to localized extinctions, but may still serve as source populations for surrounding habitats of Good or Marginal.

- Moderate – Aeolian sand present around the bases of the perennial vegetation and in the open areas surrounding the perennial vegetation. The sand at the bases of the vegetation may be at a depth and consistency suitable for MFTL burial, but the depth and consistency of the sand in the

open areas is often not suitable for MFTL burial (grain size too large, calcification of sand, or shallow depth of Aeolian sand). Localized extinction possibility is greater than Good Habitats due to lower habitat quality, smaller area of habitat, or lesser MFTL abundance; and Marginal MFTL habitat may serve as a sink population to surrounding Good or Ideal habitats.

- Poor – Aeolian sand not present in the open spaces between the perennial vegetation. Some wind-blown sand may occur in coppice mounds around the base of perennial vegetation, but the depth and consistency of sand is insufficient for MFTL burial behavior. Likely MFTL abundance in these habitats do not reach sustainable levels and will suffer localized extinctions during regular events, such as severe heat stress, drought, and predation. Poor habitat would be considered sink populations to all other MFTL habitat types.

Regarding citations and references, the limited research and knowledge about the dynamics of Aeolian sand and the limited literature about the MFTL make definitions of habitat difficult for this species. Therefore, Mr. Jarvis developed a habitat index based on personal experience (Jarvis 2009,[10] Presch personal communications 2006-2009) and the limited literature available (Barrows,[11] Stebbins,[12,13,14] and various BLM[15] and USFWS documents).

Data Request

70. Delineate any areas of creosote scrub with an active sand layer in the BSA, possibly near the desert dunes, and clarify whether this habitat was surveyed for MFTL presence or assessed for habitat suitability.

Response:

All habitat in the BSA was assessed for potential MFTL suitability. The area mapped as desert dunes was mostly creosote scrub with an active sand layer and totaled 789 acres. It was identified as desert dunes because of the active sand layer and to distinguish it from regular creosote bush scrub. Southeast of the areas mapped in Figure 10 of Appendix 5.2A to the AFC, habitat quickly degraded to poor, and then from poor to unsuitable. No MFTL were observed in poor quality habitat. Apart from the small 2.5 acre patch of suitable desert dunes habitat in the west of the site, no other suitable MFTL habitat occurred on site.

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10 Jarvis, J. M. 2009. The natural history of the Mojave fringed-toed lizard, Uma scoparia: the northern lineage, Amargosa River, CA. Master's Thesis, California State University, Fullerton, 53 p.

11 Barrows, C.W. 1997. Habitat relationships of the Coachella Valley Fringe-toed Lizard (Uma inornata). The Southwestern Naturalist, June.

12 Stebbins, R. C. 1954. Amphibians and reptiles of western North America. McGraw-Hill, New York. 536pp.

13 Stebbins, R. C. 1972. California amphibians and reptiles. Univ. California Press, Berkeley. 152pp.

14 Stebbins, R. C. 1985. A field guide to western reptiles and amphibians. Houghton Mifflin Company, Boston, Massachusetts. 336 pp.

15 Hollingsworth, B.D. and K.R. Beaman. (date unknown). Mojave fringe-toed Lizard (Uma scoparia). Bureau of Land Management. http://www.blm.gov/ca/pdfs/cdd_pdfs/fringe1.PDF

Data Request

71. Please explain why MFTL focused surveys were only conducted on 567 acres (AFC p. 5.2-38), when 789 acres of desert dunes, which is presumably suitable MFTL habitat, occurs in the BSA (AFC Table 5.2-5). Also, clarify the discrepancy between the 565 acres of habitat classification and 567 acres of survey area.

Response:

Applicant identified approximately 789 acres of desert dunes habitat in the BSA. The 565acres of habitat surveyed for MFTL along the gen-tie line included all areas of good and moderate habitat in which MFTL were expected to occur as well as some of the poor quality habitat that surrounded it. Poor quality habitat was found to not support MFTL. The remaining approximately 222 acres of desert dunes southeast of the survey limit line, as noted on Figure 10 of the Biological Resources Technical Report (BRTR), was identified as being poor quality and was not surveyed because no MFTL was expected to occur. The 2.5-acre patch of habitat in the west of the site did not support MFTL.

The 564.7 acres quantified in Figure 10 of the BRTR and in the AFC excludes the small 2.5-acre patch located in the eastern portion of the Project site (see inset of Figure 10). Together, these areas total 567.2 acres surveyed out of the 789-acre desert dunes total.

Data Request

72. Please prepare and submit a Draft Integrated Weed Management Plan. The plan shall only include weed control measures with a demonstrated record of success, based on the best available information from sources such as: The Nature Conservancy's Global Invasive Species Team, Cooperative Extension, California Invasive Plant Council, and the California Department of Food & Agriculture Encyclopedia. The Draft Plan must include the following components:

a. An assessment of nonnative and invasive weeds occurring on the site and a one-mile adjacent buffer area prior to construction activities;

b. An assessment of nonnative and invasive weeds that could be introduced into the project area (e.g., via seeds adhering to construction equipment);

c. A prevention plan, to include installation and maintenance of vehicle wash and inspection stations, and close monitoring of materials brought onto the site;

d. A monitoring plan, to ensure early timely detection of weed invasions; the plan should describe methods to be used to evaluate the presence and abundance, and evaluate threat, of introduced weeds during construction, operation, and decommissioning;

e. An action or mobilization plan to ensure timely and appropriate control of infestations. Weed infestations must be controlled or eradicated as soon as possible upon discovery, and before they go to seed, to prevent further expansion. Control methods shall meet the following criteria:

i. *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.*

ii. *Chemical. Herbicides known to have 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. 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;*

iii. *Specific and detailed guidelines for herbicide use to prevent overspray onto surrounding areas where it would adversely affect wildlife or native plants and to avoid herbicide use in or around any environmentally sensitive areas within or adjacent to the project site.*

f. *Monitoring and weed control methods shall be consistent with BLM's Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007) and the National Invasive Species Management Plan (NISC 2008); and*

g. *Reporting schedule and report contents.*

The Weed Management Plan shall address California Department of Food and Agricultural (CDFA) "A" and "B" rated weeds, BLM "A" and "B" ranked weeds, and California Invasive Plant Council (Cal-IPC) "High" and "Moderate" ranked weeds.

Response:

Applicant is preparing a Draft Integrated Weed Management Plan in accordance with the measures listed in Data Request 72 and will submit it within 90 days.

Data Request

73. Please provide the following information on all herbicides proposed for use in the project area during construction and/or operation:

a. *Herbicide common name, trade name, formulation, and chemical composition;*

b. *Proposed use and application method;*

c. *Toxicity, leaching potential, persistence in soil;*

d. *State- or agency-specific restrictions; and*

e. *Analysis of potential for exposure to adjacent desirable vegetation, potential pollution of surface water based on proximity and topography, potential pollution of groundwater based on geology/soils and depth to groundwater, and potential exposure of wildlife including aquatic species.*

Response:

Applicant is preparing a Draft Integrated Weed Management Plan in accordance with the measures listed in Data Request 72 and will submit it within 90 days. It will also include those items listed in Data Request 73.

Data Request

74. Please provide GIS data for all biological survey results (e.g., special-status species occurrences, vegetation mapping, desert tortoise habitat, delineation of waters of the U.S. and State, etc.) to the Energy Commission staff, USFWS, BLM, and CDFG.

Response:

Applicant has provided (via CD) GIS data requested in Data Request 74 and 75. A copy of this CD will be provided to the CEC, FWS, BLM and CDFG and all parties on the Proof of Service list.

Data Request

75. Please provide GIS data for all proposed project components, including those depicted on figures 5.2-2 through 5.2-4 to all of the above agencies.

Response:

See Data Response 74 above.

Data Request

76. <u>Pedestrian survey/delineation methodology</u>. Expanding on the methodology provided to CDFG on October 7, 2011 and summarized in the AFC (pg. 5.2-4043), please provide: (a) a detailed description of the pedestrian survey methodology,(b) the number of data collection points taken in the field during pedestrian surveys,(c) a figure illustrating the locations of data collection points, coordinates of each data collection point, the geographic extent of each data collection point, the criteria for selection of the data collection points, (d) all parameters recorded at each data collection point, and (e) copies of field notes/logs for each data collection point.

Response:

a) For the Rio Mesa project, URS followed the same protocol used for the Calico and Imperial Valley Solar (IVS) projects, which were accepted by CDFG (Ms. Becky Jones for Calico and Ms. Magdalena Rodriguez for IVS). The field and desktop method used was established by URS for Calico and recommended by the U.S. Army Corps of Engineers (USACE) for Rio Mesa because of the complexity of the drainage systems at the site. This approach was expanded to identify state jurisdictional areas.

   URS wetland specialists examined a high resolution (one-foot pixel) aerial image of the Project site and gen-tie line, and identified 11, mostly separate, drainage systems on the main Project site. Out of

the 11 drainage systems, URS identified 6 that appeared representative of the variety of drainage types present based on size, flow direction, connectivity, flow patterns, vegetation composition, topography, and USGS "blue lines'. On these 6 drainages a total of 14 transect locations were selected (See Attachment DR 76-4).

Four teams of two URS biologists, a wetland specialist and a biologist (see Appendix 5.2A of the AFC for personnel), visited the site over three days on April 20-22, 2011, and went to each of the selected transect locations. At the transect locations, the teams transected the drainage features taking Geographical Positioning System (GPS) points of the following features:

- edge of canopy of any wash dependent vegetation
- top of bank
- bottom of bank
- center of channel

These points (see Attachment DR 76-1) were taken leading from one edge of a drainage feature into the channels, across all intermediate channels and braids and were captured in reverse order leading out of the drainage. These are represented on Attachment DR 76-4 by the data points perpendicular to the direction of drainage flow. In addition, in the central western portion of the project site, GPS line data was taken along channels (Attachment DR 76-2) to sample the character of the drainage features in the flow direction. Two of the 14 transects taken (on drainages G and H) are magnified and the GPS points explained in Attachments DR 76-5 and DR 76-6. Attachment DR 76-7 has the GPS points numbered and correspond to the points and line data listed in Attachments DR 76-1 and DR 76-2.

The GPS data points were used as guides to performing our desktop mapping of drainages for both the USACE and CDFG. For the major wash systems, we digitized boundaries based on the GPS points. For the smaller drainages and braids we developed a system of digitizing the center lines and assigning an average width to each individual reach. Each reach center line was then buffered to create the width of the drainage for that reach. Because of the complexity of the site and the projected time to perform that work, we then simplified the buffering by rounding up to the nearest 3 feet. So the minimum channel width presented for any reach is 3 feet, which includes all drainages from 6 inches to 3 feet wide. All drainages 3-6 feet wide were rounded up to 6 feet wide, and so on. We then added all polygons of microphyll woodland. The wetlands east of the mesa were expanded from the NWI acres to all the bush seepweed-containing vegetation.

b) The number of data points taken during pedestrian surveys was 420 (Attachment DR 76-1). These points also include incidental observations, null data points, and photo points; therefore, the actual number of points representing jurisdictional boundaries is 410. Attachment DR 76-2 includes the GPS Data for the lines on Attachment DR 76-4.

c) See DR Response 76 a) and b), Attachment DR 76-1, DR 76-5, and DR 76-6, and the GPS line data attachment (Attachment DR 76-2). Transect locations were chosen semi-randomly. Non-random

selection factors included placement of one set of observation points in each of six geographically drainage systems being sampled and the placement of observation points at locations that were determined in the field to be typical or representative of each stream.

d) See DR Response 76 a) and e).

e) Information was entered digitally in the field. Additional scanned datasheets are attached for certain transects (Attachment DR 76-3) which contain the field notes taken for those transects. For each set of observation points, observers recorded general characteristics of the wash including average channel width, evidence of flow, and general vegetation were noted. GIS coordinates were recorded for each individual observation point. JD data forms (Attachment DR 76-3) include the following:

- date
- grid number
- observers
- transect number
- upstream and downstream photo numbers
- width range
- depth
- vegetation
- OHWM indicators
- notes

Data Request

77. Storm water management system. Please provide plan views and cross sections of all proposed components of the storm water management system.

Response:

For the Rio Mesa project, prevailing surface runoff is from west to east. To protect the power block development from stormwater infiltration, an intercepting ditch and diversion berm will be constructed on the upstream face of each of the powerblocks (western boundary). The ditch and berm system will wrap around the north and south side of the powerblock to divert surface runoff from the developed site. Discharge of surface waters will be accomplished at low velocities controlled by anti-erosion techniques, i.e., rip-rap or other methods. There are no stormwater impoundments expected for the Rio Mesa site. Units 1, 2 and 3 preliminary rough grading and drainage plans are shown on drawings 25670-001-CG-0010-00001, 25670-002-CG-0010-00001, and 25670-003-CG-0010-00001 (all drawings referenced in this response are included in Attachment DR 77-1). The Common Area preliminary rough grading plan is

provided on drawing 25670-009-CG-0010-00001. Drawing 25670-000-C0-0090-00002 provides erosion and sediment controls sections and details anticipated for the Rio Mesa site.

Roads, access paths, and maintenance paths will conform to the existing topography to the maximum extent possible. Roadway grades will be established to facilitate both vehicle operations, i.e., minimum cross slope and gradient, as well as runoff characteristics. In those instances where ephemeral washes and gullies are encountered, local grading will be provided to maintain the wash configuration as well as to provide approach gradients for vehicle operation. Drawing 25670-000-CG-0090-00001 depicts the anticipated method for grading roadways crossing ephemeral washes. Drawings 25670-000-C0-0090-00004 & 00005 provides details for typical grading and surfacing anticipated at the Rio Mesa site.

The principle project entrance will be via a new roadway constructed at 34th Avenue. This access road will begin at Highway 78 and traverse in a westerly direction, crossing an existing wash and providing access to the project Common Area. The entrance road crossing the wash will be raised above existing grade approximately five to six feet. To provide drainage across the roadway, a series of open-bottomed, arched box culverts will be placed at proper locations to convey the design storm waters from the site to Hodges drain. This roadway will be a two-lane, 24' wide paved road, with side slopes of 3:1 with slope protection provided to minimize scour and erosion. Drawings 25670-009-C2-0090-00010 thru 00014 show the proposed entrance road at or near 34th Avenue.

Data Request

78. Off-site downstream flows. Please provide narrative descriptions, maps, and flow calculations for all jurisdictional channels that may convey surface flow onto and off of the site. Include clear explanations of the existing conditions in and adjacent to these channels, as well as explanations of any project-related alterations to existing conditions and the locations of these alterations (Le., inside or outside of the perimeter fence). In particular, please indicate which channels (if any) would have peak flows substantially increased or decreased, and how those increases or decreases may affect downstream erosion, hydrology, and vegetation.

Response:

The project site has been designed to maintain the existing condition drainage patterns in the developed condition to the maximum extent possible. Roadways and graded areas follow basic terrain patterns so that storm water runoff is routed along existing drainage patterns after development of the site. Based on this design strategy, the drainage patterns for storm water runoff leaving the site should not be significantly altered from existing conditions.

Based on *Figure 5.2-5a ACOE Informally Agreed Waters of the U.S. – Project Site* and *Figure 5.2-5b ACOE Informally Agreed Waters of the U.S. – Generation Tie Line Corridor and Access Corridors* of the Application for Certification prepared by URS, the jurisdictional channels have been broken into nine drainage systems that discharge from the site. FLO-2D software was used to establish flow rates discharging from the site during the existing condition and post-construction condition drainage analyses. The nine drainage systems shown on the jurisdictional map correlate to floodplain cross-sections in the FLO-2D analysis that were used to determine the existing condition and post-development condition flow

rates for the site (see Attachment DR 78-1). Although the floodplain cross-sections are not in the exact same location as the established drainage systems on the jurisdictional map, they do collect the flows from these systems and represent the flows from each system as they are discharged from the site boundary. Table DR 78-1 shows the URS drainage systems, correlating floodplain cross-sections, existing condition and post-construction discharge rates, and the associated velocity and flow depths for the 100-year, 24-hr storm event.

Table DR 78-1
URS Drainage Systems

URS Drainage System	VTN Floodplain Cross Section	Existing Condition Max Discharge (cfs)	Post-Construction Max Discharge (cfs)	Flow Increase (cfs)	Existing Max Velocity (fps)	Developed Max Velocity (fps)	Existing Max Depth (ft)	Developed Max Depth (ft)
A	CS 12	490.93	520.87	29.94	2.14	2.18	1.05	1.07
B	CS 11	443.09	509.06	65.97	1.68	1.80	1.79	1.87
C	CS 10	42.52	48.80	6.28	1.43	1.49	0.47	0.50
D	CS 9	45.35	67.96	22.61	0.92	1.35	0.37	0.54
E	CS 8	787.90	801.69	13.79	2.14	2.23	1.07	1.08
F	CS 2	0.00	10.68	10.68	0.00	0.77	0.00	0.16
G	CS 3	1335.99	1369.19	33.20	2.46	2.48	1.77	1.79
H	CS 5	298.96	343.94	44.98	1.51	1.59	0.95	1.01
I	CS 6	6142.51	6142.49	-0.02	3.35	3.35	2.76	2.76

As shown, the minor increases in flow rates during the post-construction condition results in insignificant increases to flow depths and velocities. The largest increase in flow depth is 0.17 feet which should not have a significant impact to downstream properties. The largest increase in velocity is an increase of 0.77 fps for cross-section 2. However, the final velocity value of 0.77 fps is well below the normally established erosive velocity range of 3-5 fps depending on soil type. All other velocity increases are below 0.43 feet per second and the final velocities are below the 3 fps erosive threshold. Note that cross-section 6 (*URS Drainage System "F"*) has a velocity above 3 fps. However, the development of the site does not impact this drainage system and there is no increase in velocity from existing to post-construction conditions. Based on the comparison of existing condition versus post-construction condition hydraulic results, there should be no significant impact to flow depths, velocities, or downstream erosion potential due to the development of the site.

Further detailed information on existing and post-construction conditions can be found in Appendix 5.15A, "Overall Existing Condition Hydrologic & Hydraulic Analysis," and Appendix 5.15F, "Post Construction Hydrologic & Hydraulic Analysis," submitted as part of the Rio Mesa AFC.

Data Request

79. <u>Temporary and permanent channel alterations</u>. Please provide narrative descriptions of all proposed internal transportation system components and buried infrastructure components, with examples

(plan view and cross section) of typical construction at channel crossings and across upland area. Drawings should include locations of any proposed ditches or berms relative to the road or other infrastructure 'component, their depth or height, and any proposed armoring.

Response:

Please see the response to Data Request 77.

Data Request

80. Best Management Practices. Please provide narrative descriptions of any proposed best management practices or other techniques to be implemented in jurisdictional channels, or in any upstream areas where runoff might enter jurisdictional channels. Please incorporate applicable soils, drainage, erosion, storm water, and flooding BMPs in the Best Management Practices and Guidance Manual: Desert Renewable Energy Projects (Energy Commission Publication #REAT-1 000-201 0-009-F).

Response:

Please see Attachment DR 80-1, Preliminary Stormwater Pollution Prevention Plan (SWPPP) and Attachment DR 80-2, Preliminary Drainage, Erosion, and Sediment Control Plan.

Data Request

81. Feasibility of compensation or other mitigation strategies. Please provide a review and summary describing the availability of suitable compensation lands to offset the project's anticipated impacts to state jurisdictional streambeds, including microphyll woodland habitats. In addition, please provide a review and summary of any feasible alternate approaches to mitigating impacts to these resources, including habitat creation or enhancement and supporting literature demonstrating success of these activities.

Response:

Applicant is aware of several mitigation alternatives. The NECO Plan indicates that there is over 600,000 acres of desert wash woodland within the plan area. Riverside County has stated that it has lands that it is considering for conservation needs; however Applicant has not yet reviewed and validated the possibly available County lands. Privately owned lands can be acquired from willing sellers. Agricultural lands within the Colorado River floodplain that can be transformed into suitable riparian habitats would benefit riparian species being impacted by the proposed project. Lands acquired for desert tortoise mitigation will likely support varying levels of state jurisdictional waters. The LCR MSCP habitat restoration program is evidence that habitat creation and enhancement is feasible.

Data Request

82. Comprehensive special-status plant survey report. Please provide a complete report, describing methods and results of all botanical surveys completed to date. The report must address all content as recommended by CDFG (2009) and BLM (2009), including the following:

a. *A complete list of all plant taxa located during the field surveys, either on the project site or on any off-site locations where there is potential for off-site impacts (e.g., impacts of dust or other site activities in buffer areas surrounding the project site, or wash habitats downstream of the site, that may be affected by altered on-site hydrology);*

b. *List of field staff and field survey dates, indicating which botanists participated on each date;*

c. *Copies of California Natural Diversity Data Base (CNDDB) field survey forms submitted to the CNDDB;*

d. *Revisions to tables in the AFC, BRTR, and Fall 2011 Botany Report to reconcile the columns titled "Potential to occur onsite" and "Status onsite," as well as the BRTR column titled "Potential onsite status." These two or three columns should either be combined into a single column or, if retained as separate columns, should all convey consistent information. In numerous cases, the BRTR "Status onsite" column indicates "not present," an absolute, while we find that methods described can support, at most, a conclusion of "low likelihood" and, in some cases, "unknown." Similarly, the AFC columns "Potential to occur on project site" and "status onsite" often seem to contradict one another. For example, ribbed cryptantha is ranked as "moderate" potential to occur on project site, and also "observed" on the site. The phrase "suitable habitat present onsite" appears frequently throughout the table, and in one case (Wiggins' cholla) reads "suitable habitat, present onsite." The comma seems to indicate that the plant (not just the habitat) is present on the site. In cases where suitable habitat is present, but the plant was not observed, please provide expanded rationale to support the characterization of its potential to occur. For example, in cases where suitable habitat for a particular taxon is present and there are known occurrences nearby, staff would generally presume that the plant has a high probability of occurring on the site. However, if sufficiently detailed field surveys were completed within the habitat, and scheduled during a period when observations off-site confirmed that the plant could be found, then we generally would presume lower probability. Please add Astragalus sabulonum ("gravel milk-vetch") to the table and text as appropriate, throughout this section of the AFC.*

e. *Clarification of Biological Resources Technical Report (BRTR) information. Please provide clarification of the following points from the BRTR and other documents:*

    i. *BRTR page 3-5 and Fall 2011 Botany Report p. 203 uses the phrase "to the degree feasible". Please describe in detail any modifications that were made to the CDFG (2009) and BLM (2009) botanical survey guidelines protocols; the reasons for judging adherence to the guidelines "infeasible"; and documentation of approval of any modifications by the respective agencies.*

    ii. *BRTR, page 3-6, uses the phrase "most survey sections". Please clarify the definition as used in the report (e.g., is a "survey section" equivalent to a square-mile section as shown on topographic maps, or were project specific survey areas termed as "sections" for the purpose of assigning field staff to specific areas?).*

f. Please assess likelihood of occurrence of Astragalus sabulonum (gravel milkvetch) in the survey areas and, if it may occur, evaluate potential impacts. Please base this assessment on available data and a review of field work completed to date.

g. BRTR, pages 5-5 and 5-6. Please expand the discussions of expected project impacts to each special-status plant taxon observed on the site. For annual or short-lived perennial species, the field survey observations reflect only ephemeral census numbers; for these taxa, please describe impacts in terms of occupied or suitable habitat rather than census numbers. Please confirm that all locations of ribbed cryptantha are outside any areas to be disturbed directly or indirectly by project activities; and describe in detail any "appropriate project design and implementation" that would reduce or minimize impacts potential impacts to Harwood's milk-vetch.

Response:

82a. Please see Appendix C of the BTR which is included as Appendix 5.2A in the Rio Mesa SEGF AFC.

82b. Please see Appendix B of the BTR which is included as Appendix 5.2A in the Rio Mesa SEGF AFC.

82c. Please see Appendix D of the BTR which is included as Appendix 5.2A in the Rio Mesa SEFT AFC.

82d. The “Potential to Occur” column refers to the criteria used to determine the likelihood of the species to occur on site prior to starting the surveys. The “Status onsite” column reflects the results of the surveys, not a reference to an absolute. Those species that were not observed onsite during the surveys still have the potential to occur onsite due to suitable habitat and/or other occurrences of the species in close proximity to the project boundary. Thus, the status of the “Potential to Occur” column has not been changed to reflect an absolute.

In reference to the Wiggins’ cholla, “suitable habit, present onsite”, the comma is a typographical error. Wiggins’ cholla was not observed onsite at the time of the surveys but suitable habitat for the species was present onsite.

Expanded rationale to support the characterization of a species’ potential to occur is discussed in the section “Special Status Plant Survey Limitations” on page 5.2-28 of the AFC.

Astragalus sabulonum was added to the CNPS list January 2012 (CNPS. 2012. Inventory of Rare and Endangered Plants [online edition, v8-01a]). At the time of the spring botany surveys at Rio Mesa, Astragalus sabulonum was not listed as a special status species.

82e.

i. All guidelines were followed for CDFG and BLM survey protocols. Some modifications were made as many of the special status plant species did not have readily available or had non-existent reference population sites to visit prior to surveys. Some of those plants were viewed in the San Diego Natural History Museum’s Herbarium. Voucher specimens were not collected for Harwood’s milk-vetch as the status on site and other locales are unknown.

ii. Survey section refers to 95-acre square plots that were developed for the sole purpose of assigning field staff to surveys in a specific area.

82f. Astragalus sabulonum was added to the CNPS list January 2012 (CNPS. 2012. Inventory of Rare and Endangered Plants [online edition, v8-01a]). At the time of the spring botany surveys at Rio Mesa, Astragalus sabulonum was not listed as a special status species. Additionally, Astragalus sabulonum was not observed on site during both spring botany surveys. The nearest known occurrences of this species were recorded during the 1930's. All Astragalus detected were identified to species. Astragalus sabulonum was not detected during the surveys.

82g. Please see Table 5.2-11 pages 5.2-65 through 5.2-67 in the AFC for a discussion of impacts, avoidance, and mitigation to sensitive vegetation communities. Please see Table 5.2-12 for avoidance numbers of special status species and associated discussion on pages 5.2-67 through 5.2-71 . Please also see response to data request number 84 below.

Data Request

83. As requested by Riverside County in its comments on the project (Riverside 2012), please clarify (and preferably quantify) the amount of rainfall needed in summer 2012 to be determined as adequate to conduct late-season botanical surveys in fall 2012.

Response:

In 2010, CEC staff recommended using 0.4 inch of rainfall during the late summer as a criterion for determining the appropriateness of conducting a fall survey. Presence of blooming reference populations was another criterion for timing of the survey. Not attaining both of these criteria would indicate that the survey could not rule out a false negative for potential special status plant species known from the vicinity. Under such poor survey conditions, the survey should be deferred to the next year. The northern third of the transmission line received sufficient rainfall and there was a detectable reference population in the vicinity to justify a fall survey for that specific area. The remainder of the transmission line and project site lacked these two criteria for initiating survey. The Fall Botany report covering the northern portion of the transmission line was docketed with the CEC January 13, 2012.

Data Request

84. Special-status plant mitigation: Please provide a description of mitigation measures for any potentially significant project impacts to special status plants, including a strong rationale to support each measure's feasibility and efficacy.

Response:

Acquisition of Harwood's milk-vetch (State Rank S2.2: Plants rare, threatened, or endangered in California, but more common elsewhere; fairly endangered in California - 20-80% occurrences threatened) occupied habitat can be accomplished through the implementation of the tortoise habitat mitigation program. Botany surveys of desert scrub mitigation lands for tortoise will need to confirm presence of this plant species. If absent from the tortoise mitigation lands, then species specific habitat mitigation may be required.

Impacts to Harwood's eriastrum will be avoided. Impacts to other plant species detected are considered less than significant due to their low sensitivity status and relative abundance in the project vicinity.

ATTACHMENT DR 5-1

CONSTRUCTION EQUIPMENT NONROAD ENGINE EMISSION FACTORS

Rio Mesa SEGF Construction Equipment Emission Factors

Power Plant

		Tier (Nonroad) Avg mph (Onroad)	Base Emission Factors g/bhp (1)						Transient Adjustment Factor (2)							Adjustment (3)	Adjusted Emission Factors (g/bhp - Nonroad, lb/vmt Onroad)					
Equipment	HP		BSFC lb/hp-hr	NOx	CO	VOC	SOx	PM10	Adj. Type	BSFC	NOx	CO	VOC	SOx	PM10	PM10 Fuel S	BSFC	NOx	CO	VOC	SOx	PM10
CLASS 01 AUTOMOTIVE																						
SEDAN LIGHT G	175	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.31E-04	9.63E-03	8.82E-04	0.00E+00	8.53E-05
CLASS 02 TRUCKS - LIGHT DUTY																						
PICKUP 1/2 TON 4X4 CREW CAB G	302	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.31E-04	9.63E-03	8.82E-04	0.00E+00	8.53E-05
CLASS 03 TRUCKS - HEAVY DUTY																						
TRUCK DUMP TANDEM AXLE 13-15 CY D	325	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.49E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
TRUCK WATER 3600-4000G F-R SPR BAR / MONITOR 2AX	375	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.49E-02	9.17E-03	2.21E-03	3.95E-05	1.19E-03
TRUCK YARD DOG 4X2 D	200	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.31E-04	9.63E-03	8.82E-04	0.00E+00	8.53E-05
CLASS 06 PERSONNEL CARRIERS																						
ROUGH TERRAIN UTILITY VEHICLE D	25	4	0.408	4.440	2.161	0.438	0.006	0.280	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.440	2.161	0.438	0.006	0.185
CLASS 07 EMERGENCY VEHICLES																						
AMBULANCE TYPE II VAN D	302	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.49E-02	9.17E-03	2.21E-03	3.95E-05	1.19E-03
CLASS 08 LIQUID STORAGE																						
TANK FUEL STRG 10,000G DBLWALLW/PUMP	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
CLASS 11 EARTHMOVING																						
ATT HOERAM 5,000LB 270-480 BPM CAT330	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
DOZER CRAWLER 131 - 160HP D	143	3	0.367	2.500	0.867	0.184	0.005	0.220	HI LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0867	0.371	2.600	1.326	0.193	0.005	0.237
EXCAVATOR CRAWLER	266	3	0.367	2.500	0.748	0.184	0.005	0.150	HI LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
GRADER 29860LB 12' 165HP W/RPR-SCAR D	165	3	0.367	2.500	0.867	0.184	0.005	0.220	HI LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0867	0.371	2.600	1.326	0.193	0.005	0.237
LOADER BACKHOE	93	3	0.408	3.000	2.366	0.184	0.006	0.200	HI LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
TRACTOR INDUSTRIAL 60-79 PTO HP D	65	4	0.408	3.000	0.237	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	0.237	0.184	0.006	0.105
CLASS 12 PIPELAYING / TRENCHING EQUIPMENT																						
TRENCHER WHEEL CHAIN 60HP 0-60" D	55	4	0.408	3.000	0.237	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	0.237	0.184	0.006	0.105
CLASS 13 COMPACTION																						
COMPACTOR VIB SMOOTH 66" 7.7T 75HP D	110	3	0.367	3.000	2.366	0.184	0.005	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	N/A	N/A	2.49E-02	9.17E-03	2.21E-03	3.95E-05	1.19E-03
CLASS 14 CRANES																						
CRANE CRAWLER 220T M14000 D	360	3	0.367	2.500	0.843	0.167	0.005	0.150	HI LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0867	0.371	2.600	1.289	0.175	0.005	0.134
CRANE RT 70T 210HP D	210	3	0.367	2.500	0.748	0.184	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.748	0.184	0.005	0.064
TOWER CRANE LUFF M1280D 110T 250 X 271 D	700	3	0.367	2.500	1.327	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	1.327	0.167	0.005	0.064
CLASS 15 FORKLIFT																						
FORKLIFT WHS 5000LB G/LPG	48	4	0.408	4.728	0.153	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	0.153	0.279	0.006	0.105
CLASS 17 AIR COMPRESSORS																						
AIR COMPR 750CFM 275HP D	275	3	0.367	2.500	0.748	0.184	0.005	0.150	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.49E-02	9.17E-03	2.21E-03	3.95E-05	1.19E-03
CLASS 52 WELDING EQUIPMENT																						
WELDER MULTIPROCESS	40	4	0.408	4.728	0.153	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	0.153	0.279	0.006	0.105
WELDER FUSION 4"- 12" G	20	4	0.408	4.440	2.161	0.438	0.006	0.280	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.440	2.161	0.438	0.006	0.185
WACHS PIPE END PREP MACHINE 2-6 A/R	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
CONCRETE TRUCKS																						
TRANSMIXER	400	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
CLASS 54 MANLIFTS / SCISSORLIFTS																						
ELEVATOR PERS/MAT 7000LB 350 FT 2-CAR E	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
MANLIFT ARTICULATING 60-66FT 65HP D	65	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
AWP PERSONNEL LIFT 20-26FT E	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
SCISSORLIFT 26-32FT E	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
Generators	260	3	0.367	2.500	0.748	0.184	0.005	0.150	HI LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134

ATTACHMENT DR 22-1

CONSTRUCTION MODELING INPUT TABLE

Rio Mesa SEGF Modeled Construction Emissions

Short Term Impacts (24 hours and less)					
	NOx	CO	SOx	PM2.5	PM10
TOTAL					
Combustion (lbs/day)	2.200E+02	1.209E+02	4.571E-01	1.118E+01	1.118E+01
Combustion (hrs/day)	1.900E+01	1.900E+01	1.900E+01	1.900E+01	1.900E+01
Combustion (lbs/hr)	1.158E+01	6.362E+00	2.406E-02	5.885E-01	5.885E-01
Combustion (g/sec)	1.459E+00	8.016E-01	3.031E-03	7.415E-02	7.415E-02
No. of volume sources	5.000E+01	5.000E+01	5.000E+01	5.000E+01	5.000E+01
Each volume source (g/s)	2.918E-02	1.603E-02	6.063E-05	1.483E-03	1.483E-03
Construction Dust (lbs/day)				1.490E+01	1.303E+02
Construction Dust (hrs/day)				1.900E+01	1.900E+01
Construction Dust (lbs/hr)				7.841E-01	6.859E+00
Construction Dust (g/sec)				9.880E-02	8.642E-01
No. of volume sources				5.000E+01	5.000E+01
Each volume source (g/s)				1.976E-03	1.728E-02
Windblown Dust (lbs/day)				2.458E+00	6.145E+00
Windblown Dust (hrs/day)				2.400E+01	2.400E+01
Windblown Dust (lbs/hr)				1.024E-01	2.561E-01
Windblown Dust (g/sec)				1.291E-02	3.226E-02
Windblown Dust (g/sec.m2)				6.302E-10	1.576E-09
Batch Plant (lb/day)				2.897E-01	1.931E+00
Batch Plant (hrs/day)				1.900E+01	1.900E+01
Batch Plant (lbs/hr)				1.524E-02	1.016E-01
Batch Plant (g/sec)				1.921E-03	1.281E-02
No. of volume sources				5.000E+01	5.000E+01
Each volume source (g/s)				3.842E-05	2.561E-04
Size of area source to use				2.048E+07	m2
Construction Shift				2.640E+02	days/year

Long Term Impacts (annual)					
	NOx	CO	SOx	PM2.5	PM10
TOTAL					
Combustion (tons/yr)	2.571E+01	1.419E+01	5.320E-02	1.296E+00	1.296E+00
Combustion (days/yr)	2.640E+02	2.640E+02	2.640E+02	2.640E+02	2.640E+02
Combustion (hrs/day)	1.900E+01	1.900E+01	1.900E+01	1.900E+01	1.900E+01
Combustion (lbs/hr)	1.025E+01	5.659E+00	2.121E-02	5.167E-01	5.167E-01
Combustion (g/sec)	1.292E+00	7.131E-01	2.673E-03	6.510E-02	6.510E-02
No. of volume sources	5.000E+01	5.000E+01	5.000E+01	5.000E+01	5.000E+01
Each volume source (g/s)	2.583E-02	1.426E-02	5.345E-05	1.302E-03	1.302E-03
Construction Dust (tons/yr)				1.334E+00	1.168E+01
Construction Dust (days/yr)				2.640E+02	2.640E+02
Construction Dust (hrs/day)				1.900E+01	1.900E+01
Construction Dust (lbs/hr)				5.318E-01	4.656E+00
Construction Dust (g/sec)				6.701E-02	5.867E-01
No. of volume sources				5.000E+01	5.000E+01
Each volume source (g/s)				1.340E-03	1.173E-02
Windblown Dust (tons/yr)				4.486E-01	1.122E+00
Windblown Dust (days/yr)				3.650E+02	3.650E+02
Windblown Dust (hrs/day)				2.400E+01	2.400E+01
Windblown Dust (lbs/hr)				1.024E-01	2.561E-01
Windblown Dust (g/sec)				1.291E-02	3.226E-02
Windblown Dust (g/sec.m2)				6.302E-10	1.576E-09
Batch Plant (tons/yr)				3.505E-02	2.337E-01
Batch Plant (days/yr)				2.640E+02	2.640E+02
Batch Plant (hrs/day)				1.900E+01	1.900E+01
Batch Plant (lbs/hr)				1.397E-02	9.316E-02
Batch Plant (g/sec)				1.761E-03	1.174E-02
No. of volume sources				5.000E+01	5.000E+01
Each volume source (g/s)				3.521E-05	2.348E-04

ATTACHMENT DR 33-1

CONSTRUCTION CRAFT RESOURCES SURVEY

RIO MESA SOLAR ELECTRIC GENERATING STATION PROJECT BLYTHE, CALIFORNIA

CONSTRUCTION CRAFT RESOURCES SURVEY



BECHTEL CONSTRUCTION COMPANY

July 2011
BCC
Labor Relations

SECTION TWO

EXECUTIVE SUMMARY

This data for this craft labor survey was collected in June and July 2011 for the purpose of providing information on the future availability of skilled craft workers required for construction of the Rio Mesa Solar Electric Generating Facility (RMSEGF) project and to attempt to identify potential staffing challenges. The ability to sufficiently staff the Project will be most directly influenced by the following factors:

- Manpower Requirements and Availability- supply vs. demand
- Local Union Wages and Collective Bargaining Agreements – where's the money?
- Project Conditions and Living Quarters – where do I live?
- Competing Projects – where else can I work?

Seven critical crafts will account for the majority of the construction work hours. Of these seven crafts, Boilermakers, Electricians, Iron Workers and Pipefitters are considered the most critical crafts as they have historically been in high demand by Bechtel as well as by competing projects in the region. Accordingly, we will concentrate on the following seven crafts:

- Boilermakers
- Carpenters
- Electricians
- Iron Workers
- Laborers
- Operating Engineers
- Pipefitters

The wage rate and workforce population data contained in this report were obtained through written questionnaires submitted to the local unions and discussions with the applicable union representatives. The total membership and available worker data is representative of the number of active members for each union surveyed who primarily work in heavy construction and who are currently available for work. The craft cost data is based on the current wage and fringe packages contained in the appropriate local collective bargaining agreements which are locally negotiated and generally adopted by Project Labor Agreements (PLA).

The local unions having jurisdiction over the physical location of the Project will be the primary source of manpower for the Project. The other local unions in the surrounding

area considered the secondary draw area for manpower, should it be required to attract additional workers from outside the primary home locals.

Sources of Labor and Building Trades Jurisdiction

The construction local unions affiliated with the San Bernardino and Riverside Counties Building and Construction Trades Council, located in Riverside, CA, which includes the home locals that have jurisdiction over the Project and will be the primary source of manpower for the Project. For a complete contact list for these locals, refer to Section 8 of this survey.

Manpower Requirements and Availability

Survey results for total active membership and current worker availability in the primary and secondary local unions is contained in Section 3. The impact of this data as it relates to the ability to sufficiently staff the Project is also assessed in Section 3 and summarized below. Looking at this data as of August 2011, it appears that shortages of Boilermakers, Electricians and Pipefitters may be experienced on the Project during the schedule. For other crafts it appears that there will be sufficient manpower available to meet Project craft requirements.

Local Craft Union	Estimated Peak and period	Current Out-Of-Work @ 7/2011	+ / - Difference
Boilermakers Local 92	280 @ 6/2015	181	- 99
Carpenters Local 944	112 @ 7/2014	800	+ 688
Electricians Local 440	462 @ 5/2015	243	- 219
Iron Workers Local 413/433	144 @ 6/2014	1,326	+ 1,182
Laborers Local 1184	140 @ 3/2014	449	+ 309
Operating Engineers Local 12	119 @ 4/2015	2,500	+ 2,381
Pipefitters Local 364	630 @ 5-2015	135	- 495

It is notable that the data contained in this survey represents a snapshot in time. Given the demand for skilled construction workers from the large development of solar power plant in southern California we recommend that this survey be updated in mid- to late-2012.

Local Union Wages and Collective Bargaining Agreements

The table below shows the current total hourly journeymen compensation rate for each of the primary home locals, any known negotiated annual rate increases based upon the local's collective bargaining agreements and the expiration dates for these agreements. Annual increases will be allocated by the unions to wages and/or fringes.

RIO MESA SOLAR ELECTRIC GENERATING FACILITY			
Local Union	**Current Journeyman Wage/Fringe Rate**	**Local Agreements Expiration**	**Annual Wage/Fringe Increases**
Boilermakers Local #92	$66.53	09/30/11	N/A
Carpenter Local #944	$49.50	06/30/12	N/A
Electricians Local #440	$54.67	11/30/11	09/05/11 - +$0.70
Iron Workers Local #416 and #433	$57.31	06/30/14	$3.50 increase over the 3 years duration of the new agreement
Laborers Local #1184	$44.68	06/30/12	N/A
Operating Engineers Local #12	$59.94	06/30/13	07/01/12 - +$1.70
Pipefitters Local #364	$59.49	06/30/12	N/A

It is not possible to report on annual wage and fringe benefit increases these crafts will receive following the expiration of their agreements. However, data gathered by the Construction Labor Research Council (CLRC) indicates that, nationally, construction union contract increases already negotiated for 2011 average 1.9% or about $0.98 per hour and for 2012 the average is 3.1% or some $1.49 of the total package.

Competing Projects

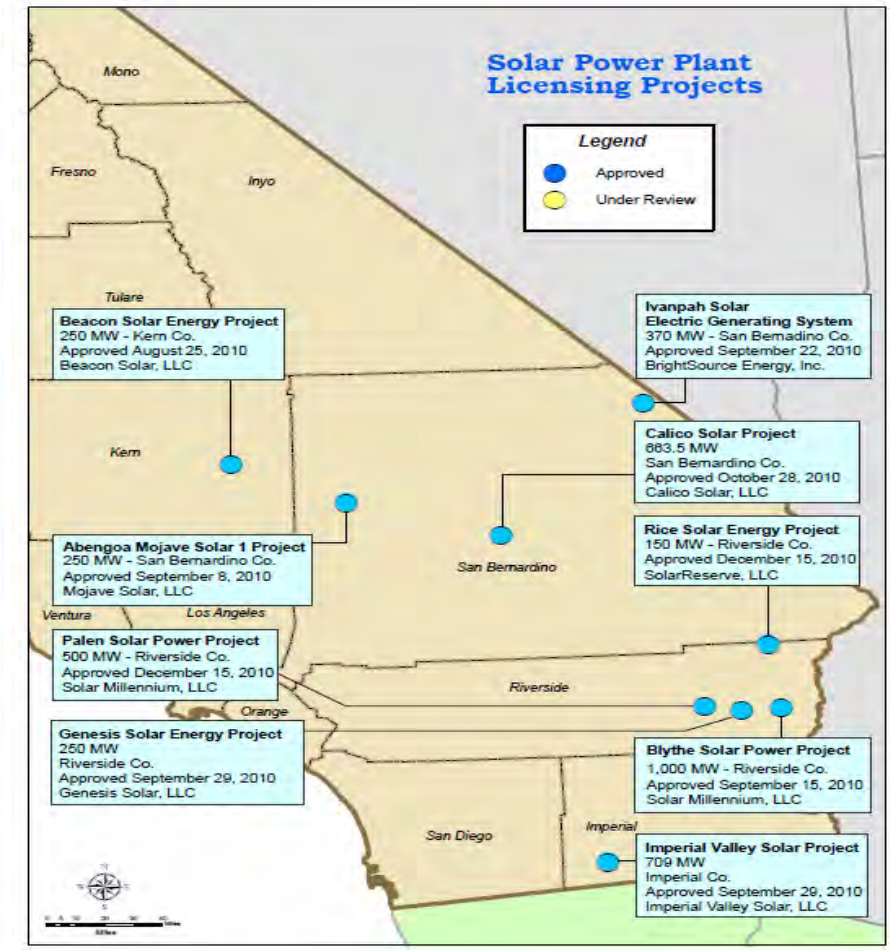
During the 35-month construction schedule for RMSEGF, there are 118 major projects anticipated to be constructed within a 300-mile radius of the Project with 48 of these projects located within 150 miles. These projects will potentially compete for the same skilled construction craft workers required by that of RMSEGF. And of these projects some 118 projects show estimated start and/or completion dates between June 2013 and April 2016

In addition to these 118 projects, it will be important to monitor any upcoming work at any surrounding refineries and nuclear facilities as this work has a large demand for skilled labor, particularly for the mechanical/electrical crafts (Boilermakers, Electricians and Pipefitters). There is very often a lot of overtime associated with this work, making

such jobs very appealing and potentially very competitive with the Project in attracting and retaining skilled workers.

Competing Solar Projects in San Bernardino & Riverside Counties

Currently there are eight solar projects in various stages of development and construction located in San Bernardino and Riverside Counties and one in Imperial County. Of these, seven are new solar jobs, including Ivanpah, and one is a 50 MW solar trough technology plant being constructed as part of the 513 MW combined cycle Victorville 2 Hybrid Power Project in San Bernardino County.



All nine of the projects have received approval to proceed from the California Energy Commission. The table below provides information from the California Energy Commission website for each of these projects and can be accessed by using the following link http://www.energy.ca.gov/siting/solar/index.html.

Project Name	Location	Size & Technology (megawatts)	Scheduled Start	Scheduled Completion
Victorville 2 Hybrid Power Project	San Bernardino County	563 MW 513 MW natural gas 50 MW solar trough	N/A	N/A
Abengoa Mojave Solar Project	San Bernardino County	250 MW solar trough	N/A	N/A
Solar Millennium Blythe	Riverside County	1,000 MW solar trough	November 2010	2015
Ivanpah Solar	San Bernardino County	370 MW solar tower	October 2010	2014
Genesis Solar	Riverside County	250 MW solar trough	January 2011	N/A
Calico Solar Project	San Bernardino County	663.5 MW Stirling engine	June 2012	N/A
Solar Millennium Palen	Riverside County	500 MW solar trough	September 2010	N/A
Rice Solar Energy Project	Riverside County	150 MW central tower	September 2011	N/A

The San Bernardino and Riverside Counties Building and Construction Trades Council has jurisdiction over these eight projects and will be the primary source for skilled craft resources. Accordingly these projects will be in direct competition with the Rio Mesa Solar Electric Generating Facility Project for attracting and retaining the necessary skilled craft workers. The question is, how much will the actual construction schedules interfere with each other? From the data on the CEC website, we can't tell. We can see, however, that if even half of these proposed projects proceed, skilled craft will be in short supply.

Housing

There are some 400 to 500 hotel and motel rooms and 700 apartments. There is also approximately 650 RV spaces but no data was gathered as to the services available at the each RV park, i.e. water, electricity and or sewer. Availability data is sketchy due to owner reluctance to divulge private information on the phone but we did find that there is about 10% availability for apartments. See section 6 for details

SECTION THREE

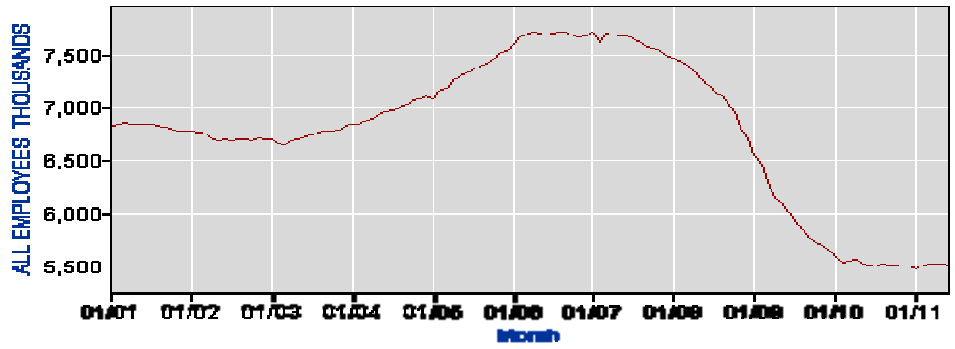
CRAFT POPULATION AND THE SUPPLY AND DEMAND FOR CRAFT RESOURCES

Forecasting potential shortages of craft resources and potential problems in staffing the Rio Mesa Solar Electric Generating Facility project is done by studying the overall construction employment in California and specifically employment conditions in the local unions. This study, coupled with an analysis of potential projects that will be competing for the same source of labor required by the Project, will allow for a better understanding of the supply and demand for skilled labor available in the area for the survey period of the remainder of 2011 through 2016.

Employment

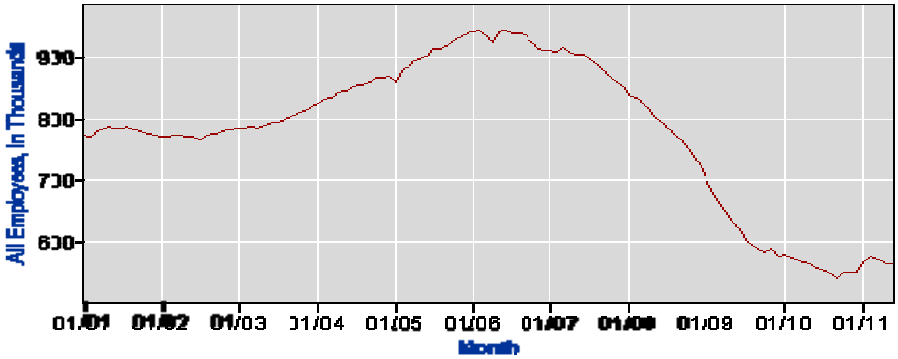
The economic downturn has been hard on our business and continues to affect construction employment nationally. Construction employment plummeted by some 2,200,000 workers, a 28.5% decrease since the 2006 high water mark as reported by the US Department of Labor BLS and shown in the table below.

Table: Ten year history of construction employment nationally – www.bls.com



Compared to the national level, construction employment in California has also been affected by the economic downturn. Construction employment in California has decreased at an even greater fall of 40%, equivalent to some 379,000 workers, since the early 2006 zenith, as reported by the US Department of Labor BLS and shown in the table below.

Table: Ten year history of construction employment in California – www.bls.com



The employment curve shown above suggests that there should be construction craft resources available to staff the Project. To get a better picture of the current availability compared to the Project requirements, even though the timing is some three to four years apart, it is a valuable exercise to "see" into the future where the problems may arise.

Local Craft Union	Estimated Peak and period	Current Out-Of-Work @ 7/2011	+ / - Difference
Boilermakers Local 92	280 @ 6/2015	181	- 99
Carpenters Local 944	112 @ 7/2014	800	+ 688
Electricians Local 440	462 @ 5/2015	243	- 219
Iron Workers Local 413/433	144 @ 6/2014	1,326	+ 1,182
Laborers Local 1184	140 @ 3/2014	449	+ 309
Operating Engineers Local 12	119 @ 4/2015	2,500	+ 2,381
Pipefitters Local 364	630 @ 5-2015	135	- 495

The table above lists Bechtel's estimated "peak" craft requirements for the construction of the Project and current craft availability as reported by the primary locals having jurisdiction over the Project as of July 2011. Clearly if the project were being constructed today, we would be experiencing shortages of Boilermakers, Electricians, and Pipefitters and welders. While the numbers above do not show potential problems, we know from Bechtel projects in California that we will face shortages of Iron Worker connectors and welders. Similarly, there is a nation-wide shortage of long boom crane operators, and those who have experience operating high cranes as will be required.

Union Manpower Availability

The remainder of this section contains data collected for the seven surveyed crafts. It is important to review overall craft availability to help predict craft staffing challenges. This data is based on the following information:

- Total membership numbers (excluding retirees) for each craft that are active and seeking work in heavy industrial.
- Total numbers of active journeymen and apprentices from the home locals who have jurisdiction over the Project and the total number available at the time of the survey.
- Total numbers of active journeymen and apprentices for the surrounding locals located within the area surveyed.

BOILERMAKERS

CRAFT	LOCAL UNION	CITY	ST	NO. OF JOURNEY PERSONS	NO. OF APP	TOTAL ACTIVE MEMBERS	NO. CURRENT AVAILABLE	TOTAL NO. OF WELDERS	NO. MILES TO BLYTHE
BM	627	PHOENIX	AZ	400	80	480	330	275	150
BM	92	BLOOMINGTON	CA	480	50	530	181	280	173
BM	4	PAIGE	AZ	500	80	580	216	300	420
BM	549	PITTSBURG	CA	340	78	418	230	141	581
TOTAL				**1,720**	**288**	**2,008**	**957**	**996**	

Boilermakers Union Local 92 has jurisdiction over Rio Mesa and covers southern California and southern Nevada. Local 92 has 530 active members comprised of 480 journeymen and 50 apprentices. Of these 530 members, 280 are certified welders. At the time of this survey, the local had 181 members on their out of work list. The estimated “peak” demand for Boilermakers at the Project is 280 workers or about 53% of the local union.

The remaining surveyed locals indicate a total active membership of 1,478 with 776 workers currently available. This suggests the likelihood of available Boilermakers in the primary and secondary draw areas to properly staff the Project. Historically, Boilermaker welders have always been in high demand and their availability should continue to be monitored as the mid-2013 project mobilization date approaches. It should also be noted that the spring and fall seasons are high employment periods due to refinery turnarounds and power plant outages were overtime becomes a huge attraction for welders and riggers.

CARPENTERS

CRAFT	LOCAL UNION	CITY	ST	NO. OF JOURNEY PERSONS	NO. OF APP	TOTAL ACTIVE MEMBERS	NO. CURRENT AVAILABLE	NO. MILES TO BLYTHE
CP	408	PHOENIX	AZ	2,500	200	2,700	472	150
CP	944	SAN BERNARDINO	CA	1,998	500	2,498	800	172
CP	2361	ORANGE	CA	5,412	993	6,405	356	205
CP	1780	LAS VEGAS	NV	713	124	837	83	209
CP	1977	LAS VEGAS	NV	5,585	424	6,009	2,333	209
CP	547	SAN DIEGO	CA	1,855	750	2,605	300	217
CP	409	WEST SIDE	CA	2,198	248	2,446	380	224
CP	1506	LOS ANGELES	CA	1,553	340	1,893	219	224
CP	630	LONG BEACH	CA	1,259	318	1,577	280	226
CP	209	SAN FERNANDO	CA	1,619	583	2,202	220	244
CP	150	VENTURA	CA	1,700	300	2,000	250	290
CP	743	BAKERSFIELD	CA	269	80	349	70	336
CP	713	ALAMEDA	CA	2,954	264	3,218	370	581
CP	152	CONTRA COSTA	CA	3,733	337	4,070	564	598
CP	35	SAN RAFAEL	CA	338	30	368	60	615
CP	971	RENO	NV	1,180	48	1,228	149	624
CP	751	SANTA ROSA	CA	895	90	985	187	652
		TOTAL		**35,761**	**5,629**	**41,390**	**7,093**	

The Carpenters union that has jurisdiction over the Project is Local 944 located in San Bernardino. Total active membership for Local 944 is 2,498 members comprised of 1,998 journeymen and 500 apprentices. At the time of this survey, there were 800 workers on the out of work list. Given that the difference between the Local's availability and the estimated peak demand is +688, there appears to be sufficient numbers available to staff the project. Should it be necessary to attract workers from outside Local 944, the surrounding locals surveyed have a total active membership of 38,892 with 6,293 workers currently available.

ELECTRICIANS - INSIDE WIREMEN

CRAFT	LOCAL UNION	CITY	ST	NO. OF JOURNEY PERSONS	NO. OF APP	TOTAL ACTIVE MEMBERS	NO. CURRENT AVAILABLE	NO. MILES TO BLYTHE
EL	640	PHOENIX	AZ	1,595	144	1,739	202	150
EL	477	SAN BERNARDINO	CA	511	169	680	100	172
EL	440	RIVERSIDE	CA	545	180	725	243	173
EL	357	LAS VEGAS	NV	3,500	500	4,000	150	209
EL	441	SANTA ANA	CA	1,800	360	2,160	349	210
EL	569	SAN DIEGO	CA	1,345	243	1,588	352	217
EL	11	LOS ANGELES	CA	3,520	880	4,400	1,050	224
EL	518	GLOBE	AZ	195	20	215	39	238
EL	570	TUCSON	AZ	500	135	635	77	266
EL	952	VENTURA	CA	440	30	470	73	290
EL	413	SANTA BARBARA	CA	276	49	325	24	318
EL	428	BAKERSFIELD	CA	500	100	600	63	336
EL	595	DUBLIN	CA	1,300	193	1,493	240	572
EL	617	SAN MATEO	CA	648	120	768	160	593
EL	401	RENO	NV	430	48	478	140	623
EL	551	SANTA ROSA	CA	630	164	794	67	652
		TOTAL		**17,735**	**3,335**	**21,070**	**3,329**	

The numbers above represent Inside Wiremen only. Electricians Local 440 has jurisdiction over the Project and is located in Riverside. Local 440 has 725 active workers comprised of 545 journeymen and 180 apprentices. At the time of this survey, the local had 243 members on the out of work list.

The Project has an estimated "peak" demand for 462 Electricians, accounting for nearly 64% of Local 440's entire active membership. The surrounding locals have a total active membership of 20,345 with a current availability of 3,086. These numbers suggest the likelihood that Electricians will be available from the primary and secondary areas to properly staff the Project.

IRON WORKERS

CRAFT	LOCAL UNION	CITY	ST	NO. OF JOURNEY PERSONS	NO. OF APP	TOTAL ACTIVE MEMBERS	NO. CURRENT AVAILABLE	NO. MILES TO BLYTHE
IW	75	PHOENIX	AZ	505	85	590	153	150
IW	229	SAN DIEGO	CA	820	127	947	243	217
IW	416	NORWALK	CA	1,645	255	1,900	289	224
IW	433	LOS ANGELES	CA	2,780	558	3,338	1,037	224
TOTAL				**5,750**	**1,025**	**6,775**	**1,722**	

Iron Workers Locals 416 (Reinforcing) located in Norwalk and 433 (Structural) located in Los Angeles have jurisdiction over the Project. The Project has estimated that the "peak" demand for Iron Workers is 144. Between the two locals, there are 4,425 Journeymen and 813 Apprentices, showing a total membership of 5,238 Iron Workers. At the time the survey was performed, there were almost 1,300 Iron Workers available for work between these two locals, suggesting the likelihood that there will be sufficient numbers of Iron Workers to cover the project, especially since both Iron Worker Locals have sub-offices in Las Vegas.

LABORERS

CRAFT	LOCAL UNION	CITY	ST	NO. OF JOURNEY PERSONS	NO. OF APP	TOTAL ACTIVE MEMBERS	NO. CURRENT AVAILABLE	NO. MILES TO BLYTHE
LB	383	PHOENIX	AZ	780	0	780	175	150
LB	783	SAN BERNARDINO	CA	1,133	47	1,180	234	172
LB	1184	RIVERSIDE	CA	3,975	111	4,086	449	172
LB	872	LAS VEGAS	NV	3,900	56	3,956	1,200	209
LB	89	SAN DIEGO	CA	1,815	110	1,925	187	217
LB	802	WILMINGTON	CA	1,000	100	1,100	134	233
LB	585	VENTURA	CA	521	42	563	145	291
TOTAL				**13,124**	**466**	**13,590**	**2,524**	

Laborers Local 1184 is located in Riverside, and is the home local having jurisdiction for the Rio Mesa Project. The "peak" demand for Laborers has been estimated to be 140. Given the fact that Local 1184 has 3,975 Laborers and 111 Apprentices, bringing the total of active members to 4,086 and with 449 on the Out of Work List and available to work at this time, there will most likely be sufficient numbers to man the project from the primary home local.

OPERATING ENGINEERS

CRAFT	LOCAL UNION	CITY	ST	NO. OF JOURNEY PERSONS	NO. OF APP	TOTAL ACTIVE MEMBERS	NO. CURRENT AVAILABLE	NO. MILES TO BLYTHE
OE	428	PHOENIX	AZ	1,325	33	1,358	445	150
OE	12	PASADENA	CA	8,000	500	8,500	2,500	221
TOTAL				**9,325**	**533**	**9,858**	**2,945**	

Operating Engineers Local 12 is the home local for the Rio Mesa Project, and has jurisdiction for the entire southern part of the state of California. Located in Pasadena, Local 12 also has a sub-office in Las Vegas. Currently, our survey shows Local 12 to have approximately 8,000 Operators and 500 Apprentices, bring their active membership to 8,500. The project has estimated a "peak" demand for Operating Engineers at 119. As of the time of this survey, the local was experiencing a 30% Unemployment rate.

When examining the data illustrated above a rosy picture is painted for the Operating Engineers. However, it must be noted that there has been a nation-wide shortage of qualified crane operators, especially larger, lattice boom and high-capacity cranes. From our experience at Ivanpah, we are working very closely with Operating Engineers #12 and have been able to attract qualified crane operators. This specific skill will need continued vigilance as the project proceeds to the field.

PIPEFITTERS

CRAFT	LOCAL UNION	CITY	ST	NO. OF JOURNEY PERSONS	NO. OF APP	TOTAL ACTIVE MEMBERS	NO. CURRENT AVAILABLE	NO. MILES TO BLYTHE
PF	469	PHOENIX	AZ	1,930	400	2,330	141	150
PF	364	COLTON	CA	900	145	1,045	135	170
PF	398	POMONA	CA	800	190	990	287	195
PF	525	LAS VEGAS	NV	1,600	300	1,900	1,150	209
PF	582	SANTA ANA	CA	435	188	623	141	210
PF	230	SAN DIEGO	CA	1,133	193	1,326	248	217
PF	250	LOS ANGELES	CA	3,850	307	4,157	742	224
PF	494	LONG BEACH	CA	140	60	200	50	226
PF	761	BURBANK	CA	725	249	974	224	232
PF	484	VENTURA	CA	241	43	284	109	290
PF	114	SANTA BARBARA	CA	230	35	265	60	318
PF	460	BAKERSFIELD	CA	310	50	360	109	336
PF	246	FRESNO	CA	350	60	410	42	440
PF	467	SAN MATEO	CA	754	130	884	179	591
PF	342	CONCORD	CA	2,000	275	2,275	270	591
PF	159	MARTINEZ	CA	430	40	470	186	597
PF	350	RENO	NV	445	62	507	224	623
		TOTAL		**16,273**	**2,727**	**19,000**	**4,297**	

Pipefitters Union Local 364 has jurisdiction over Rio Mesa and covers San Bernardino and Riverside Counties. Local 364 has 1,045 active members comprised of 900 journeymen and 145 apprentices. At the time of this survey, the local had 135 members on their out of work list. The estimated “peak” demand for Pipefitters at the Project is 630 workers, or about 60% of the entire local union.

The remaining surveyed locals indicate a total active membership of 17,955 with 4,162 workers currently available. This suggests the likelihood of available Pipefitters in the primary and secondary draw areas to properly staff the Project. Historically, like the Boilermakers and the other mechanical trades, Pipefitter welders have always been in high demand by Bechtel and other contractors. For this reason, Pipefitter availability should continue to be monitored and updated accordingly.

SECTION FOUR

WAGE COMPARISONS AND COLLECTIVE BARGAINING

A competitive wage rate may be the most important subject in attracting and retaining sufficient craft to a project. The journeyman wage rates and fringe benefit packages contained in this Section reflect the currently negotiated rates in each craft's local agreement. With the exception of the IBEW, the wage rates for the local unions that have jurisdiction over the Project are equal with the surrounding locals in southern California.

Currently, all of the home locals with jurisdiction over the Project, and listed below, have agreements set to expire prior to the mid-2013 project mobilization date with the exception of the Iron Workers which is set to expire in 2014. It will be important to monitor the results of upcoming contract negotiations to determine the labor escalation for the Project.

Craft and local union	Agreement expiration dates
Boilermakers Local 92	09-30-2011
Carpenters Local 944	06-30-2012
Cement Masons Local 500	06-30-2013 – now in negotiations
IBEW Local 440	11-30-2011
Insulators Local 5	12-31-2011
Ironworkers (rebar) Local 416	06-30-2014
Ironworkers (structural) Local 433	06-30-2014
Laborers Local 1184	06-30-2012
Millwrights Local 1607	06-30-2012
Operating Engineers Local 12	06-30-2013
Sheet Metal Workers Local 105	12-31-2011
Sprinkler Fitters Local 669	03-31-2013
Teamsters Local 166	06-30-2013
UA local 364	06-30-2013

The following tables provide the wage, fringe and total package rates for the locals in the primary and secondary draw areas. The home locals with jurisdiction over the Project are highlighted in "blue." The tables are organized by **highest to lowest wage rate**.

BOILERMAKERS

CRAFT	LOCAL UNION	CITY	ST	EFFECTIVE DATE	WAGE RATE	TOTAL FRINGE	TOTAL PACKAGE	CONTRACT EXPIRATION DATE
BM	549	PITTSBURG	CA	4/1/2011	$ 42.42	$ 29.91	$ 72.33	9/30/2011
BM	92	BLOOMINGTON	CA	4/1/2011	$ 41.26	$ 25.27	$ 66.53	9/30/2011
BM	627	PHOENIX	AZ	4/1/2011	$ 32.49	$ 24.11	$ 56.60	9/30/2011
BM	4	PAIGE	AZ	4/1/2011	$ 31.25	$ 24.11	$ 55.36	9/30/2011
Avg. wage within surveyed area: $ 36.86								

The wage and fringe benefit package for Boilermakers Local 92 is the second highest for the area surveyed with a wage rate that is $4.40 above the average. This compensation package should be very significant in attracting any necessary Boilermakers from the surrounding areas

CARPENTERS

CRAFT	LOCAL UNION	CITY	ST	EFFECTIVE DATE	WAGE RATE	TOTAL FRINGE	TOTAL PACKAGE	CONTRACT EXPIRATION DATE
CP	35	SAN RAFAEL	CA	7/1/2011	$ 37.50	$ 24.98	$ 62.48	6/30/2015
CP	152	CONTRA COSTA	CA	7/1/2011	$ 37.50	$ 24.98	$ 62.48	6/30/2015
CP	713	ALAMEDA	CA	7/1/2011	$ 37.50	$ 24.98	$ 62.48	6/30/2015
CP	751	SANTA ROSA	CA	7/1/2011	$ 37.50	$ 24.98	$ 62.48	6/30/2015
CP	944	SAN BERNARDINO	CA	7/1/2011	$ 37.35	$ 12.15	$ 49.50	6/30/2012
CP	150	VENTURA	CA	7/1/2011	$ 37.35	$ 12.15	$ 49.50	6/30/2012
CP	209	SAN FERNANDO	CA	7/1/2011	$ 37.35	$ 12.15	$ 49.50	6/30/2012
CP	409	WEST SIDE	CA	7/1/2011	$ 37.35	$ 12.15	$ 49.50	6/30/2012
CP	547	SAN DIEGO	CA	7/1/2011	$ 37.35	$ 12.15	$ 49.50	6/30/2012
CP	630	LONG BEACH	CA	7/1/2011	$ 37.35	$ 12.15	$ 49.50	6/30/2012
CP	2361	ORANGE	CA	7/1/2011	$ 37.35	$ 12.15	$ 49.50	6/30/2012
CP	1506	LOS ANGELES	CA	7/1/2011	$ 37.35	$ 12.15	$ 49.50	6/30/2012
CP	743	BAKERSFIELD	CA	7/1/2011	$ 36.78	$ 12.15	$ 48.93	6/30/2012
CP	971	RENO	NV	7/1/2011	$ 34.73	$ 15.18	$ 49.91	6/30/2012
CP	1780	LAS VEGAS	NV	7/1/2011	$ 34.73	$ 15.18	$ 49.91	6/30/2012
CP	1977	LAS VEGAS	NV	7/1/2011	$ 34.73	$ 15.18	$ 49.91	6/30/2012
CP	408	PHOENIX	AZ	7/1/2011	$ 23.00	$ 8.54	$ 31.54	6/30/2012
Avg. wage within surveyed area: $ 36.05								

Carpenters Local 944 has a current wage rate of $37.35. This rate is only $0.15 less than the highest wage rate surveyed and $1.30 higher than the average for all the surrounding locals. Local 944's fringe benefit rates are significantly lower than the Northern California locals, but are equal to those locals located in close proximity. Having wages that are equal to or higher than the majority of locals surveyed should assist Local 944 in attracting workers from these areas should it be necessary.

ELECTRICIANS – INSIDE WIREMEN

CRAFT	LOCAL UNION	CITY	ST	EFFECTIVE DATE	WAGE RATE	TOTAL FRINGE	TOTAL PACKAGE	CONTRACT EXPIRATION DATE
EL	617	SAN MATEO	CA	6/1/2011	$ 50.00	$ 25.44	$ 75.44	5/31/2012
EL	551	SANTA ROSA	CA	6/1/2011	$ 48.00	$ 12.75	$ 60.75	5/31/2015
EL	477	SAN BERNARDINO	CA	1/1/2011	$ 45.85	$ 17.54	$ 63.39	9/4/2011
EL	595	DUBLIN	CA	6/1/2011	$ 45.00	$ 28.05	$ 73.05	5/31/2013
EL	441	SANTA ANA	CA	5/1/2011	$ 39.84	$ 14.37	$ 54.21	11/27/2011
EL	357	LAS VEGAS	NV	6/1/2011	$ 38.99	$ 17.42	$ 56.41	11/30/2011
EL	413	SANTA BARBARA	CA	1/1/2011	$ 38.29	$ 17.79	$ 56.08	5/31/2013
EL	11	LOS ANGELES	CA	7/25/2011	$ 38.27	$ 23.88	$ 62.15	6/30/2012
EL	952	VENTURA	CA	8/1/2011	$ 37.28	$ 18.48	$ 55.76	9/30/2012
EL	569	SAN DIEGO	CA	12/1/2010	$ 36.65	$ 12.59	$ 49.24	5/31/2012
EL	401	RENO	NV	12/1/2010	$ 36.15	$ 14.63	$ 50.78	11/30/2012
EL	440	RIVERSIDE	CA	9/5/2010	$ 35.45	$ 19.22	$ 54.67	11/30/2011
EL	428	BAKERSFIELD	CA	5/1/2011	$ 33.15	$ 18.04	$ 51.19	4/30/2012
EL	640	PHOENIX	AZ	6/21/2011	$ 25.01	$ 8.85	$ 33.86	6/30/2012
EL	518	GLOBE	AZ	2/1/2011	$ 24.55	$ 9.91	$ 34.46	7/31/2011
EL	570	TUCSON	AZ	6/1/2011	$ 23.40	$ 9.01	$ 32.41	5/31/2012
Avg. wage within surveyed area: $ 37.24								

Electricians Local 440 has a current wage rate of $35.45. This is the second lowest rate of all the California locals surveyed and is $1.79 less than the overall average rate of $37.24. Because the Project's estimated peak demand for Electricians represents over 60% of Local 440's entire active membership, there is an increased possibility that it will be necessary to bring in additional workers from other areas.

IRON WORKERS

CRAFT	LOCAL UNION	CITY	ST	EFFECTIVE DATE	WAGE RATE	TOTAL FRINGE	TOTAL PACKAGE	CONTRACT EXPIRATION DATE
IW	75	PHOENIX	AZ	8/1/2010	$ 26.52	$ 18.73	$ 45.25	7/31/2013
IW	416	NORWALK	CA	7/1/2011	$ 33.00	$ 24.735	$ 57.735	6/30/2014
IW	433	LOS ANGELES	CA	7/1/2011	$ 33.00	$ 24.735	$ 57.735	6/30/2014
IW	229	SAN DIEGO	CA	7/1/2011	$ 33.00	$ 24.735	$ 57.735	6/30/2014
Avg. wage within surveyed area: $ 31.38								

The Iron Worker Locals in California and parts of Nevada have the same wage and fringe rates at $33.00 and $24.735, respectively. Should it be necessary to attract workers from Arizona, these rates will have an impact as wages are $6.48 higher than those of Local 75.

The California Iron Workers, including Locals 416 and 433, just recently negotiated a three year extension to their contract which is now set to expire on 6/30/14. The total increase to wages and/or fringes for the duration of this new contract will be $3.50.

LABORERS

CRAFT	LOCAL UNION	CITY	ST	EFFECTIVE DATE	WAGE RATE	TOTAL FRINGE	TOTAL PACKAGE	CONTRACT EXPIRATION DATE
LB	1184	RIVERSIDE	CA	7/1/2011	$ 27.29	$ 17.39	$ 44.68	6/30/2012
LB	585	VENTURA	CA	7/1/2011	$ 27.29	$ 17.39	$ 44.68	6/30/2012
LB	783	SAN BERNARDINO	CA	7/1/2011	$ 27.29	$ 17.39	$ 44.68	6/30/2012
LB	802	WILMINGTON	CA	7/1/2011	$ 27.29	$ 17.39	$ 44.68	6/30/2012
LB	89	SAN DIEGO	CA	7/1/2011	$ 26.50	$ 16.71	$ 43.21	6/30/2012
LB	872	LAS VEGAS	NV	1/1/2011	$ 25.31	$ 19.05	$ 44.36	6/30/2011
LB	383	PHOENIX	AZ	6/1/2011	$ 17.98	$ 4.85	$ 22.83	5/31/2011
Avg. wage within surveyed area: $ 25.56								

The wage rate for Laborers Local 1184 is $27.29 and is the same as the southern California locals. This is the highest rate for all surveyed locals and is $1.73 above the overall average rate of $25.56

OPERATING ENGINEERS

CRAFT	LOCAL UNION	CITY	ST	EFFECTIVE DATE	WAGE RATE	TOTAL FRINGE	TOTAL PACKAGE	CONTRACT EXPIRATION DATE
OE	12	PASADENA	CA	7/1/2011	$ 39.02	$ 20.92	$ 59.94	6/30/2013
OE	428	PHOENIX	AZ	6/1/2011	$ 26.30	$ 9.50	$ 35.80	6/30/2011
Avg. wage within surveyed area: $ 32.66								

The wage rate for Operating Engineers Local 12 is $39.02 and represents a basic crane rate. There is a huge difference in wage rates in Phoenix, which is about 150 miles from the Project. There is a nationwide shortage of qualified crane operators.

PIPEFITTERS

CRAFT	LOCAL UNION	CITY	ST	EFFECTIVE DATE	WAGE RATE	TOTAL FRINGE	TOTAL PACKAGE	CONTRACT EXPIRATION DATE
PF	467	SAN MATEO	CA	7/1/2011	$ 53.90	$ 26.17	$ 80.07	6/30/2012
PF	342	CONCORD	CA	7/1/2011	$ 51.21	$ 31.19	$ 82.40	6/30/2012
PF	159	MARTINEZ	CA	7/1/2011	$ 50.22	$ 28.19	$ 78.41	6/30/2013
PF	525	LAS VEGAS	NV	8/1/2010	$ 38.57	$ 17.95	$ 56.52	9/30/2013
PF	469	PHOENIX	AZ	7/1/2011	$ 38.50	$ 15.55	$ 54.05	6/30/2014
PF	364	COLTON	CA	7/1/2011	$ 36.47	$ 23.02	$ 59.49	6/30/2012
PF	114	SANTA BARBARA	CA	7/1/2011	$ 36.47	$ 23.02	$ 59.49	6/30/2012
PF	230	SAN DIEGO	CA	7/1/2011	$ 36.47	$ 23.02	$ 59.49	6/30/2012
PF	250	LOS ANGELES	CA	7/1/2011	$ 36.47	$ 23.02	$ 59.49	6/30/2012
PF	398	POMONA	CA	7/1/2011	$ 36.47	$ 23.02	$ 59.49	6/30/2012
PF	460	BAKERSFIELD	CA	7/1/2011	$ 36.47	$ 23.02	$ 59.49	6/30/2012
PF	484	VENTURA	CA	7/1/2011	$ 36.47	$ 23.02	$ 59.49	6/30/2012
PF	494	LONG BEACH	CA	7/1/2011	$ 36.47	$ 23.02	$ 59.49	6/30/2012
PF	582	SANTA ANA	CA	7/1/2011	$ 36.47	$ 23.02	$ 59.49	6/30/2012
PF	761	BURBANK	CA	7/1/2011	$ 36.47	$ 23.02	$ 59.49	6/30/2012
PF	246	FRESNO	CA	1/1/2011	$ 35.45	$ 23.45	$ 58.90	9/30/2011
PF	350	RENO	NV	8/1/2011	$ 29.58	$ 15.82	$ 45.40	7/31/2012
Avg. wage within surveyed area: $ 38.95								

The wage rate for Pipefitters Local 364 is $36.47, is located in the upper third of those local unions surveyed. This rate equals the wage and fringe rates for southern California, as Local 364 is part of District Council 16 whose geographical area covers the southern half of the state. While Las Vegas and Phoenix have higher wage rates, their total packages are much less than Colton's - $2.97 (Las Vegas) and $5.44 (Phoenix).

SECTION FIVE

MAJOR INDUSTRIAL AND COMMERCIAL PROJECTS COMPETING FOR SKILLED CRAFTS

The maps, graphs and data spreadsheets contained in this Section show potential craft demands for competing projects that have a total investment value (TIV) greater than $100 million and are located within a 300 mile-radius of the Rio Mesa Solar Electric Generating Facility. This 300 mile-radius encompasses areas of Arizona, California, Nevada and Utah.

Data indicates that within 300 miles of the Project there are a total of 118 potential competing projects having a total combined value of approximately $84.8 billion. These projects are estimated to be started and/or completed between June 2013 and April 2016.

All of this competing project data information comes from Industrial Information Resources (IRR), a market information service that has been tracking and providing comprehensive market intelligence pertaining to industrial processing, heavy manufacturing and energy related industries throughout the world for over 25 years. It should be noted that many of the 118 competing projects listed have not received permitting or financial closure.

While the total investment values are derived from the IRR marketing information service, they are intended to represent an order of magnitude and are not reflective of actual project costs.

Figure One

Figure one shows the relative locations of potential competing projects being tracked by IIR broken down by a 0-150 mile radius and a 151-300 mile radius. As indicated, there are 48 potential competing projects within a 150 mile radius with a TIV of $39.6 billion and an additional 70 within a 300 mile radius valued at $45.2 billion. All of these projects combined have a TIV of over $84.8 billion. Following Figure one are two tables that include selected information for each of these competing projects.

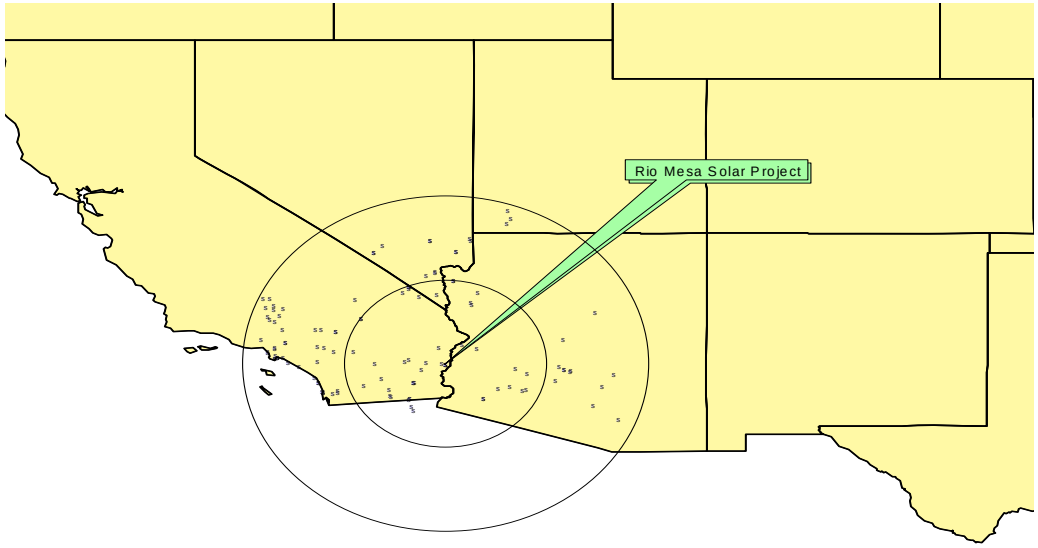
Figure Two

Figure two is a graph showing the potential craft demand by project for all projects in Power, Oil Gas & Chemical (OG&C) and Civil with a TIV of $100 million or more. These projects are then populated with craft staffing needs based upon historical Bechtel data for projects in these industries. As the data indicates, there is a potential need for nearly 18,000 total craft by the end of 2013.

Figure Three

Figure three shows all of the projects displayed on the graph in Figure two listed by project name.

Rio Mesa Solar Generating Station
Competing Project Search



Notes:

1. Only Projects in excess of $100 MM are shown.
2. Projects represented are forecast to be Started and/or Completed between 06-13 and 04-16.
3. All Industries are represented.
4. Data Provided via BCOI Craft Labor Database and IIR- Industrial Information Resources.

	0-150 Miles		151-300 Miles		Totals 0-300 Miles	
State	# of Projects	TIV	# of Projects	TIV	# of Projects	TIV
Arizona	15	$14,240,000,000	12	$9,105,800,000	27	$23,345,800,000
California	30	$23,441,000,000	46	$24,468,000,000	76	$47,909,000,000
Nevada	3	$1,900,000,000	12	$11,642,000,000	15	$13,542,000,000
Utah	0	$0	3	$800,000,000	3	$800,000,000
Totals	48	$39,581,000,000	70	$45,215,800,000	118	$84,796,800,000

FIGURE ONE

COMPETING PROJECTS OVER $100 MILLION
0 - 150 MILES

TIV	Industry	Owner	Developer	Plant Name	City	State	Start	Completion	Project Name
$250,000,000	Power	Central Arizona Water Conservation Distr	Central Arizona Water Conservation Distr	Harquvar Transmission Line	Bouse	Arizona	201203	201403	BOUSE 230KV HARCUVAR GRASSROOT TRANSMISSION LINE
$500,000,000	Power	Sempra Generation	Zachry Holding	Mesquite PV Solar Park	Arlington	Arizona	201106	201306	ARLINGTON GRASSROOT 150MW MESQUITE PV SOLAR PARK PHASE I
$1,740,000,000	Power	Agua Caliente Solar LLC	First Solar Incorporated	Agua Caliente PV Solar	Roll	Arizona	201010	201401	ROLL GRASSROOT 290MW AGUA CALIENTE PV SOLAR POWER PLANT
$750,000,000	Power	Starwood Energy Group Global LLC	Starwood Energy Group Global LLC	Starwood Solar I	Tonopah	Arizona	201202	201406	TONOPAH GRASSROOT 150MW STARWOOD SOLAR I POWER PLANT
$800,000,000	Power	EnviroMission (USA) Incorporated	EnviroMission (USA) Incorporated	La Paz Solar Power	Parker	Arizona	201111	201311	PARKER GRASSROOT 200MW LA PAZ SOLAR POWER PLANT
$600,000,000	Petroleum Refining (HPI)	Arizona Clean Fuels Yuma	Arizona Clean Fuels Yuma	Yuma Refinery	Yuma	Arizona	201207	201412	YUMA REFINERY OFFSITE UTILITIES ADDITION
$1,400,000,000	Power	Abengoa Solar Incorporated	Abengoa	Solana Solar Generating Station	Gila Bend	Arizona	201101	201310	GILA BEND GRASSROOT 280MW SOLANA SOLAR GENERATING STATION
$1,000,000,000	Power	Ablaisa Solar Corporation	Ablaisa Solar Corporation	Kingman Solar Project	Kingman	Arizona	201209	201412	KINGMAN 200MW GRASSROOT SOLAR PROJECT
$3,700,000,000	Petroleum Refining (HPI)	Arizona Clean Fuels Yuma	Environmental Resources Management	Yuma Refinery	Yuma	Arizona	201207	201412	YUMA GRASSROOT CRUDE OIL REFINERY
$450,000,000	Power	Western Wind Energy Corporation	Western Wind Energy Corporation	Kingman Wind & Solar Power Station	Kingman	Arizona	201209	201403	KINGMAN II 200MW WINDFARM POWER STATION EXPANSION
$650,000,000	Power	SolarReserve LLC	SolarReserve LLC	Crossroads Solar Project	Gila Bend	Arizona	201304	201504	GILA BEND GRASSROOT SOLAR 150MW CROSSROADS CSP ENERGY
$400,000,000	Power	Music Mountain Hydro LLC	Music Mountain Hydro LLC	Music Mountain Pumped Storage	Kingman	Arizona	201507	201607	KINGMAN GRASSROOT HYDRO 350MW MUSIC MOUNTAIN PUMPED STORAGE
$300,000,000	Power	BP Alternative Energy North America Inc	BP Alternative Energy North America Inc	Mohave County Windfarm	Dolan Springs	Arizona	201508	201608	DOLAN SPRINGS 150MW MOHAVE COUNTY WINDFARM ADDITION
$1,000,000,000	Power	Iberdrola Renewables USA	Iberdrola Renewables USA	Hyder Valley Solar Energy Project	Hyder	Arizona	201305	201512	HYDER SOLAR GRASSROOT 200MW VALLEY CSP POWER PROJECT
$700,000,000	Power	BP Alternative Energy North America Inc	BP Alternative Energy North America Inc	Mohave County Windfarm	Dolan Springs	Arizona	201307	201507	DOLAN SPRINGS GRASSROOT 350MW MOHAVE COUNTY WINDFARM
$14,240,000,000	15								
$850,000,000	Power	Rice Solar Energy LLC	SolarReserve LLC	Rice Thermal Solar Energy Project	Desert Center	California	201207	201412	DESERT CENTER GRASSROOT 150MW RICE CONCENTRATING SOLAR THERMAL ENERGY PROJECT
$250,000,000	Power	Southern California Edison Company	Southern California Edison Company	Devers Substation	Desert Hot Springs	California	201110	201308	DESERT HOT SPRINGS GRASSROOT 500 KV DEVERS - COLORADO RIVER TRANSMISSION LINE
$680,000,000	Power	Summit Energy LLC	Summit Engineering	Blythe II Energy Project	Blythe	California	201206	201412	BLYTHE NATURAL GAS 520MW COMBINED-CYCLE ENERGY PROJECT II
$120,000,000	Power	Layman Energy Associates Incorporated	United States Bureau of Land Management	Superstition Mountain Geothermal Power	Imperial	California	201309	201506	IMPERIAL R-R 20MW-40MW SUPERSTITION MTN GEOTHERMAL POWER
$1,000,000,000	Power	Solar Millennium LLC	MAN Solar Millennium LLC	Palen Solar Park	Desert Center	California	201203	201406	DESERT CENTER GRASSROOT 500MW PALEN SOLAR PARK
$100,000,000	Power	Nevada Geothermal Power Incorporated	Nevada Geothermal Power Incorporated	Truckhaven Geothermal Power	Westmorland	California	201206	201306	WESTMORLAND GRASSROOT 30MW TRUCKHAVEN GEOTHERMAL POWER STATION
$2,000,000,000	Power	Tessera Solar North America	Tessera Solar North America	Riverside Solar Park	Thermal	California	201304	201604	THERMAL GRASSROOT 500MW RIVERSIDE SOLAR PARK
$427,000,000	Power	BrightSource Energy Incorporated	BrightSource Energy Incorporated	Ivanpah Solar Electric Generating Sys (I	Apple Valley	California	201212	201410	APPLE VALLEY 133MW IVANPAH SOLAR CSP PHASE II ADDITION
$3,000,000,000	Power	Solar Millennium LLC	Solar Millennium LLC	Blythe Solar Park	Blythe	California	201306	201604	BLYTHE GRASSROOT 500MW CONCENTRATED SOLAR POWER (CSP) PARK
$1,000,000,000	Power	K Road Sun	K Road Sun	Calico Solar Energy Project	Newberry Springs	California	201204	201312	NEWBERRY SPRINGS GRASSROOT 275MW CALICO PHASE I PV SOLAR PLANT
$1,000,000,000	Power	Genesis Solar LLC	Tetra Tech Incorporated	Genesis Solar Plant	Desert Center	California	201110	201401	DESERT CENTER G-R 250MW GENESIS SOLAR ENERGY (CSP) PROJECT
$2,000,000,000	Power	K Road Sun	K Road Sun	Calico Solar Energy Project	Newberry Springs	California	201401	201505	NEWBERRY SPRINGS 575MW CALICO SPRINGS PHASE II PV SOLAR PLANT
$900,000,000	Power	First Solar Incorporated	First Solar Incorporated	Stateline Solar Park	Nipton	California	201210	201408	NIPTON GRASSROOT 300MW STATELINE PHOTOVOLTAIC SOLAR PARK
$226,000,000	Power	Ram Power Corporation	Ram Power Corporation	Orita Geothermal Power	Brawley	California	201507	201612	BRAWLEY GRASSROOT 50MW PHASE I ORITA GEOTHERMAL POWER STATION
$500,000,000	Power	LS Power Development LLC	LS Power Development LLC	Centinela Solar Power Plant	Calexico	California	201208	201408	CALEXICO GRASSROOT 130MW CENTINELA SOLAR POWER PLANT
$1,500,000,000	Power	Solar Trust of America LLC	Solar Trust of America LLC	Blythe Solar Park	Blythe	California	201510	201711	BLYTHE 250MW CONCENTRATED SOLAR POWER (CSP) ADDITION PHASE III
$1,500,000,000	Power	Solar Millennium LLC	Solar Millennium LLC	Blythe Solar Park	Blythe	California	201309	201510	BLYTHE 250MW CONCENTRATED SOLAR POWER (CSP) ADDITION
$416,000,000	Power	Terraska Solar Ventures	CSolar Development LLC	Imperial Solar Energy Center South	Seeley	California	201111	201310	SEELEY GRASSROOT 130MW IMPERIAL SOLAR ENERGY CENTER SOUTH
$480,000,000	Power	Terraska Solar Ventures	CSolar Development LLC	Imperial Solar Energy Center West	Seeley	California	201210	201503	SEELEY GRASSROOT 150MW IMPERIAL SOLAR ENERGY CENTER WEST
$250,000,000	Metals & Minerals	Molycorp Minerals LLC	Molycorp Minerals LLC	Mountain Pass A-G Rare Earth Element Min	Mountain Pass	California	201212	201312	MOUNTAIN PASS A-G RARE EARTH OXIDE MINE & MILL PHOENIX EXPANSION PHASE II
$427,000,000	Power	Solar Partners LLC	BrightSource Energy Incorporated	Ivanpah Solar Electric Generating Sys (I	Apple Valley	California	201403	201609	APPLE VALLEY 133MW IVANPAH SOLAR CSP PHASE III ADDITION
$345,000,000	Power	Mainstream Renewable Power	Mainstream Renewable Power	Graham Pass Windfarm	Desert Center	California	201210	201310	DESERT CENTER GRASSROOT 150MW GRAHAM PASS WINDFARM
$700,000,000	Power	Axio Power Incorporated	Metropolitan Water District of Southern	Diamond Valley Lake PV Solar Power Plant	Riverside	California	201403	201510	RIVERSIDE GRASSROOT 70-100MW DIAMOND VALLEY LAKE PV SOLAR POWER PLANT
$300,000,000	Power	Sol Orchard LLC	SolFocus	Sol Orchard CPV Solar Plant	San Diego	California	201303	201406	SAN DIEGO GRASSROOT 50MW SOL ORCHARD CPV SOLAR POWER PLANT
$620,000,000	Power	8minutenergy Renewables LLC	8minutenergy Renewables LLC	Midway Solar Farm	Calipatria	California	201407	201506	CALIPATRIAL SOLAR 165MW MIDWAY SOLAR FARM ADDITION
$300,000,000	Power	8minutenergy Renewables LLC	8minutenergy Renewables LLC	Salton Sea Solar Farm	Calipatria	California	201404	201410	CALIPATRIAL 100MW SALTON SEA SOLAR FARM ADDITION
$150,000,000	Power	8minutenergy Renewables LLC	8minutenergy Renewables LLC	Salton Sea Solar Farm	Calipatria	California	201303	201309	CALIPATRIA GRASSROOT 50MW SALTON SEA SOLAR PV FARM
$800,000,000	Power	8minutenergy Renewables LLC	8minutenergy Renewables LLC	Mount Signal Solar Farm	Calexico	California	201308	201408	CALEXICO GRASSROOT 200MW MOUNT SIGNAL SOLAR PV FARM
$800,000,000	Power	8minutenergy Renewables LLC	8minutenergy Renewables LLC	Calexico Solar Farm	Calexico	California	201308	201408	CALEXICO GRASSROOT 200MW SOLAR PV FARM
$800,000,000	Power	8minutenergy Renewables LLC	8minutenergy Renewables LLC	Calexico Solar Farm	Calexico	California	201406	201508	CALEXICO 200MW SOLAR FARM PHASE II ADDITION
$23,441,000,000	30								
$500,000,000	Power	Duke Energy Generation Services (DEGS)	URS Corporation	Searchlight Windfarm	Searchlight	Nevada	201201	201306	SEARCHLIGHT GRASSROOT 352MW WINDFARM
$400,000,000	Power	Southern California Edison Company	Ecology & Environmental Incorporated	Ivanpah Substation	Primm	Nevada	201110	201312	PRIMM 115KV EL DORADO-IVANPAH 220KV TRANSMISSION LINE REBUILD
$1,000,000,000	Power	First Solar Incorporated	First Solar Incorporated	Silver State Solar Park	Primm	Nevada	201310	201710	PRIMM 250MW SILVER STATE SOUTH SOLAR POWER PLANT
$1,900,000,000	3								

COMPETING PROJECTS OVER $100 MILLION
151 – 300 MILES

TIV	Industry	Owner	Developer	Plant Name	City	State	Start	Completion	Project Name
$751,000,000	Power	Tucson Electric Power Company	Tucson Electric Power Company	H W Sundt Power Station (Irvington Stati	Tucson	Arizona	201210	201410	TUCSON N/G 400MW-529MW H W SUNDT UNIT ADDITION
$900,000,000	Power	Foresight Wind Energy LLC	Foresight Wind Energy LLC	Grapevine Canyon Windfarm	Mormon Lake	Arizona	201204	201306	MORMAN LAKE GRASSROOT 200MW-400MW GRAPEVINE CANYON WINDFARM
$850,000,000	Power	Tucson Electric Power Company	EPS Incorporated	Pinal Central Substation	Casa Grande	Arizona	201306	201406	CASA GRANDE GRASSROOT 500KV PINAL CENTRAL-TORTOLITA TRANSMISSION LINE
$110,000,000	Pharmaceutical & Biotech	Arizona State University	Arizona State University	Tempe University Biodesign Institute	Tempe	Arizona	201405	201507	TEMPE BIODESIGN INSTITUTE BUILDING C ADDITION
$400,000,000	Power	Salt River Project Agricultural Improvem	Salt River Project Agricultural Improvem	Pinal West-to-Southeast Browning Project	Tempe	Arizona	201203	201406	TEMPE PW-SEVIBRG 500KV/230KV GRASSROOT DISTRIBUTION SUBSTATION
$200,000,000	Industrial Manufacturing	Valley Metro-RPTA	Jacobs Engineering Group	Phoenix Commuter Rail Station	Phoenix	Arizona	201211	201501	PHOENIX DOWNTOWN MESA LIGHT RAIL EXTENSION
$5,000,000,000	Metals & Minerals	Resolution Copper Mining LLC	Resolution Copper Mining LLC	Superior U-G Copper Mine	Superior	Arizona	201408	201904	SUPERIOR GRASSROOT U-G COPPER MINE & CONCENTRATOR
$237,800,000	Metals & Minerals	Curis Resources (Arizona) Incorporated	Curis Resources (Arizona) Incorporated	Florence In-Situ Recovery Copper Mine &	Florence	Arizona	201201	201403	FLORENCE GRASSROOT IN-SITU RECOVERY COPPER MINE & SX/EW PLANT
$100,000,000	Power	Arizona Public Service Company	EPS Incorporated	Sun Valley Substation	Waddell	Arizona	201404	201605	WADDELL 230KV/500KV SUN VALLEY-MORGAN GRASSROOT TRANSMISSION LINE
$273,000,000	Industrial Manufacturing	Valley Metro-RPTA	URS Corporation	Glendale Light Rail Extension	Glendale	Arizona	201501	201701	GLENDALE GRASSROOT LIGHT RAIL EXTENSION
$142,000,000	Pharmaceutical & Biotech	University of Arizona	Zimmer Gunsul Frasca Partnership	Phoenix University Medical Research	Phoenix	Arizona	201108	201312	PHOENIX ARIZONA CANCER RESEARCH CENTER ADDITION
$100,000,000	Metals & Minerals	Arizona Gold & Onyx Mining Company	Arizona Gold & Onyx Mining Company	Mayer A-G Polymetallic Mine	Mayer	Arizona	201405	201510	MAYER GRASSROOT A-G POLYMETALLIC MINE & MILL
$9,105,900,000	12								
$800,000,000	Power	The Nevada Hydro Company	The Nevada Hydro Company	Lake Elsinore Pumped Storage Hydro (LEAD	Lake Elsinore	California	201206	201512	LAKE ELSINORE GRASSROOT 500MW PUMP STORAGE HYDRO POWER PLANT
$100,000,000	Power	Cogentrix Energy Incorporated	Enpex Corporation	Quail Brush Generation	Santee	California	201306	201405	SANTEE GRASSROOT NATURAL GAS 100MW QUAIL BRUSH POWER PLANT
$200,000,000	Production (Oil & Gas)	Tidelands Oil Production Company	Tidelands Oil Production Company	Long Beach Crude Oil Production	Long Beach	California	201104	201312	LONG BEACH CRUDE OIL PRODUCTION FIELD EXPANSION
$490,000,000	Industrial Manufacturing	Metro Gold Line Construction Authority	Hill International Incorporated	Arcadia Light Rail Station	Arcadia	California	201206	201501	ARCADIA METRO PHASE 2A GOLD LINE FOOTHILL RAIL EXTENSION
$200,000,000	Terminals	Plains All American Pipeline LP	Moffatt & Nichol Engineers	Los Angeles Crude Oil Terminal	San Pedro	California	201204	201306	LOS ANGELES G-R DEEP WATER CRUDE OIL TERMINAL SITE 1
$230,000,000	Terminals	Plains All American Pipeline LP	SPEC Services Incorporated	Los Angeles Crude Oil Terminal	San Pedro	California	201204	201306	LOS ANGELES G-R DEEP WATER CRUDE OIL TERMINAL SITE 2
$260,000,000	Food & Beverage	Poseidon Resources Corporation	Poseidon Resources Corporation	Huntington Beach Desalination	Huntington Beach	California	201206	201406	HUNTINGTON BEACH GRASSROOT DESALINATION PLANT
$650,000,000	Power	City of Palmdale	Inland Energy Incorporated	Palmdale Power Station	Palmdale	California	201206	201406	PALMDALE GRASSROOT 570MW SOLAR & COMBINED-CYCLE POWER STATION
$105,000,000	Industrial Manufacturing	Port of Long Beach	MWH Americas Incorporated	Long Beach Container Terminal	Long Beach	California	201203	201312	LONG BEACH PIER S BERTHS S102-S110 BACKLANDS
$320,000,000	Food & Beverage	Poseidon Resources Corporation	Poseidon Resources Corporation	Carlsbad Seawater Desalination	Carlsbad	California	201112	201310	CARLSBAD GRASSROOT SEAWATER DESALINATION PLANT
$950,000,000	Power	Genesis Solar LLC	Tetra Tech Incorporated	Beacon Solar CSP Energy Project	California City	California	201306	201412	CALIFORNIA CITY GRASSROOT 250MW BEACON SOLAR (CSP) PROJECT
$600,000,000	Power	EnviroMission (USA) Incorporated	EnviroMission (USA) Incorporated	Victorville CSP Solar Tower	Victorville	California	201407	201609	VICTORVILLE GRASSROOT 200MW SOLAR TOWER CSP POWER PLANT
$1,300,000,000	Power	San Diego County Water Authority	San Diego County Water Authority	San Vicente Pumped-Storage Hydro Station	Lakeside	California	201408	201809	LAKESIDE G-R 460-570MW SAN VINCENTE PUMPED-STORAGE HYDRO
$100,000,000	Alternative Fuel	Rentech Incorporated	UOP LLC	Rialto Renewable Energy Center	Rialto	California	201205	201309	RIALTO G-R RENEWABLE ENERGY CENTER
$250,000,000	Power	Los Angeles Department of Water & Power	Los Angeles Department of Water & Power	Barren Ridge Substation	Bakersfield	California	201210	201504	BAKERSFIELD 230KV BARREN RIDGE GRASSROOT TRANSMISSION LINE
$230,000,000	Transmission (Oil & Gas)	Kinder Morgan Energy Partners LP	TRC Companies Incorporated	Colton Metering Station	Colton	California	201301	201309	COLTON TO LAS VEGAS G-R REFINED PRODUCTS PIPELINE
$1,000,000,000	Power	First Solar Incorporated	First Solar Incorporated	AV Solar Ranch One	Lancaster	California	201107	201312	LANCASTER GRASSROOT 230MW AV SOLAR RANCH ONE
$205,000,000	Terminals	Southern California Gas Company	Southern California Gas Company	Aliso Canyon Natural Gas Storage	Northridge	California	201201	201403	ALISO CANYON NATURAL GAS STORAGE COMPRESSOR STATION REPLACEMENT
$460,000,000	Power	eSolar Incorporated	NRG Energy Incorporated	Gaskell Solar Power Plant	Rosamond	California	201304	201606	ROSAMOND GRASSROOT 276MW GASKELL SOLAR POWER PLANT
$710,000,000	Industrial Manufacturing	Metro Gold Line Construction Authority	Parson Brinkerhoff	Arcadia Light Rail Station	Arcadia	California	201309	201706	ARCADIA METRO PHASE 2B GOLD LINE FOOTHILL RAIL EXTENSION
$180,000,000	Power	Alpine SunTower LLC	eSolar Incorporated	Alpine PV Solar Part	Lancaster	California	201203	201310	LANCASTER GRASSROOT 92MW ALPINE PV SOLAR PARK
$850,000,000	Power	Los Angeles Department of Water & Power	Los Angeles Department of Water & Power	Haynes Generating Station	Long Beach	California	201108	201309	LONG BEACH NATURAL GAS 1,584MW HAYNES PLANT 600MW UNIT #5 & #6 REPOWER
$350,000,000	Pharmaceutical & Biotech	Salk Institute For Biological Studies	Latitude 33 Planning and Engineering	San Diego R & D	La Jolla	California	201201	201412	LA JOLLA BIOLOGICAL RESEARCH INSTITUTE EXPANSION
$484,000,000	Power	Carlsbad Energy Center LLC	Carlsbad Energy Center LLC	Carlsbad Energy Center	Carlsbad	California	201207	201501	CARLSBAD NATURAL GAS GRASSROOT 558MW COMBINED-CYCLE PLANT

TIV	Industry	Owner	Developer	Plant Name	City	State	Start	Completion	Project Name
$2,000,000,000	Power	Acciona Solar Power Incorporated	Clark Energy Group LLC	Fort Irwin Solar Part	Fort Irwin	California	201304	201404	FORT IRWIN GRASSROOT 500MW SOLAR PARK PHASE I
$320,000,000	Power	Los Angeles Department of Water & Power	Los Angeles Department of Water & Power	Scattergood Generating Station	Playa Del Rey	California	201209	201504	SCATTERGOOD NATURAL GAS 320MW COMBINED-CYCLE UNIT ADDITION
$135,000,000	Pharmaceutical & Biotech	University of California San Diego	Zimmer Gunsul Frasca Architects LLP	San Diego University Research	La Jolla	California	201101	201307	LAJOLLA UNIVERSITY BIOMEDICAL RESEARCH FACILITY UNIT 2 ADDITION
$120,000,000	Industrial Manufacturing	Port of Long Beach	AECOM	Long Beach Container Terminal	Long Beach	California	201110	201512	LONG BEACH PIER E BERTH E24-E27 SLIP 3 IMPROVEMENTS PHASE I
$300,000,000	Chemical Processing (CPI)	YaSheng Group Limited	YaSheng Group Limited	Victorville Chemical Logistics Center	Victorville	California	201208	201308	VICTORVILLE G-R CHEM LOGISTICS CTR & ECO-TRADE ZONE PHASE II
$140,000,000	Power	Watson Cogeneration Company	BP Products North America Incorporated	Watson Cogen	Carson	California	201210	201312	CARSON NATURAL GAS 82MW WATSON COGEN UNIT #5 ADDITION
$700,000,000	Power	First Solar Incorporated	First Solar Incorporated	Monte Vista Solar Plant	Bakersfield	California	201204	201308	BAKERSFIELD GRASSROOT 126MW MONTE VISTA SOLAR POWER PLANT
$400,000,000	Power	Cannon Solar Partners LLC	Cannon Power Group	Lucerne Valley Solar Part	Victorville	California	201209	201409	VICTORVILLE 100MW LUCERNE VALLEY SOLAR FARM EXPANSION
$1,000,000,000	Power	Cannon Solar Partners LLC	Cannon Power Group	Lucerne Valley Solar Part	Victorville	California	201306	201406	VICTORVILLE GRASSROOT 500MW LUCERNE VALLEY SOLAR PARK
$234,000,000	Pharmaceutical & Biotech	University of California San Diego	Zimmer Gunsul Frasca Partnership	San Diego University Research	La Jolla	California	201207	201504	LA JOLLA CLINICAL AND TRANSLATIONAL RESEARCH INSTITUTE ADDITION
$1,500,000,000	Industrial Manufacturing	Exposition Construction Authority	Skanska/Rados	Los Angeles UCC/Exposition Park Rail Stn	Los Angeles	California	201205	201505	LOS ANGELES MID-CITY/EXPOSITION LIGHT RAIL EXPANSION PHASE II
$825,000,000	Power	NRG Energy Incorporated	El Segundo Power LLC	El Segundo Power Station	El Segundo	California	201107	201307	EL SEGUNDO 550MW COMBINED-CYCLE NATURAL GAS POWER PLANT ADDITION
$100,000,000	Food & Beverage	WinCo Foods Incorporated	WinCo Foods Incorporated	Beaumont Grocery Distribution Center	Beaumont	California	201204	201309	BEAUMONT GRASSROOT GROCERY DISTRIBUTION CENTER
$100,000,000	Food & Beverage	Metropolitan Water District of Southern	Metropolitan Water District of Southern	Laguna Beach Desalination	Laguna Beach	California	201406	201606	LAGUNA BEACH GRASSROOT SEAWATER DESALINATION PLANT
$2,000,000,000	Food & Beverage	San Diego County Water Authority	San Diego County Water Authority	Camp Pendleton Seawater Desalination	Camp Pendleton	California	201201	201401	CAMP PENDLETON GRASSROOT SEAWATER DESALINATION PLANT
$852,000,000	Power	Sempra Generation	Sempra Generation	Rosamond Solar Plant	Bakersfield	California	201207	201310	BAKERSFIELD GRASSROOT 200MW ROSAMOND SOLAR POWER PLANT
$320,000,000	Power	Pio Pico Energy Center LLC	Apex Power Group LLC	Pio Pico Energy Center	San Diego	California	201302	201408	SAN DIEGO NATURAL GAS GRASSROOT 300MW PIO PICO ENERGY CENTER
$400,000,000	Power	Pajuela Peak Hydro LLC	Pajuela Peak Hydro LLC	Pajuela Peak Pumped Storage	Mojave	California	201507	201807	MOJAVE HYDRO GRASSROOT 250MW PAJUELA PEAK PUMPED STORAGE
$456,000,000	Pharmaceutical & Biotech	Scripps Research Institute	KPFF Consulting Engineers	La Jolla Research	La Jolla	California	201103	201504	LA JOLLA SCRIPPS CARDIOVASCULAR INSTITUTE ADDITION
$460,000,000	Power	Terra-Gen Power LLC	Terra-Gen Power LLC	Morgan Hills Windfarm	Mojave	California	201207	201312	MOJAVE GRASSROOT 230MW MORGAN HILLS WINDFARM
$800,000,000	Power	Terra-Gen Power LLC	Terra-Gen Power LLC	Pahnamid Windfarm	Tehachapi	California	201207	201312	TEHACHAPI GRASSROOT 411MW PAHNAMID WINDFARM
$100,000,000	Power	Los Angeles Department of Public Works	Green Conversion Systems LLC	Los Angeles Waste-to-Energy	Los Angeles	California	201209	201409	LOS ANGELES GRASSROOT 11MW WASTE-TO-ENERGY PLANT
$13,362,000,000	22								
$692,000,000	Power	First Solar Incorporated	First Solar Incorporated	Boulder City PV Solar	Boulder City	Nevada	201110	201306	BOULDER CITY 150MW GRASSROOT SOLAR PV POWER STATION
$1,500,000,000	Power	Solar Millennium LLC	Solar Millennium LLC	Amargosa Solar Park	Amargosa Valley	Nevada	201312	201512	AMARGOSA VALLEY 250MW PHASE II CSP SOLAR PARK EXPANSION
$350,000,000	Power	EnviroMission (USA) Incorporated	EnviroMission (USA) Incorporated	Nevada CSP Solar Energy	Mercury	Nevada	201407	201609	MERCURY GRASSROOT 220MW NEVADA SOLAR CSP ENERGY PLANT
$750,000,000	Power	Toquop Energy LLC	Sithe Global Power LLC	Toquop Energy	Mesquite	Nevada	201207	201503	MESQUITE NATURAL GAS GRASSROOT 600MW TOQUOP POWER PLANT PHASE I
$1,500,000,000	Power	Solar Millennium LLC	Solar Millennium LLC	Amargosa Solar Park	Amargosa Valley	Nevada	201112	201312	AMARGOSA VALLEY GRASSROOT 250MW CSP SOLAR PARK
$1,000,000,000	Power	BrightSource Energy Incorporated	BrightSource Energy Incorporated	Coyote Springs Solar Generating Station	Coyote Springs	Nevada	201206	201407	COYOTE SPRINGS GRASSROOT 200 MW SOLAR POWER PLANT
$2,100,000,000	Power	BrightSource Energy Incorporated	BrightSource Energy Incorporated	Mormon Mesa Solar Generating Station	Overton	Nevada	201206	201407	MORMON MESA GRASSROOT 400MW SOLAR POWER PLANT
$1,200,000,000	Power	BrightSource Energy Incorporated	BrightSource Energy Incorporated	Mormon Mesa Solar Generating Station	Overton	Nevada	201407	201607	MORMON MESA 400MW PHASE II CSP SOLAR POWER ADDITION
$1,000,000,000	Power	BrightSource Energy Incorporated	BrightSource Energy Incorporated	Coyote Springs Solar Generating Station	Coyote Springs	Nevada	201407	201512	COYOTE SPRINGS 200MW PHASE II CSP SOLAR POWER ADDITION
$750,000,000	Power	Sempra Generation	Sempra Generation	Black Hills Solar Power Station	Boulder City	Nevada	201209	201403	BOULDER CITY GRASSROOT 200MW BLACK HILLS SOLAR POWER STATION
$500,000,000	Power	Sithe Global Power LLC	Sithe Global Power LLC	Flat Top Mesa PV Solar Park	Alamo	Nevada	201207	201307	ALAMO GRASSROOT 50MW-100MW FLAT TOP MESA PV SOLAR PARK
$400,000,000	Power	Renewable Energy Transmission Company	Resero Consulting	Amagosa Valley Substation	Boulder City	Nevada	201309	201512	BOULDER CITY GRASSROOT 500KV SOLAR EXPRESS TRANSMISSION LINE
$11,542,000,000	12								
$600,000,000	Metals & Minerals	CML Metals LLC	Samuel Engineering Incorporated	Cedar City Iron Mountain A-G Iron Ore Mi	Cedar City	Utah	201109	201306	CEDAR CITY IRON MOUNTAIN A-G IRON ORE MINE RESTART/EXPANSION PHASE II
$200,000,000	Power	Wasatch Wind LLC	Wasatch Wind LLC	Harmony Mountains Wind Farm	New Harmony	Utah	201210	201307	NEW HARMONY GRASSROOT 100MW WINDFARM
$100,000,000	Metals & Minerals	Mesa Uranium Corporation	Continental Metalurgical Services	Pine Valley IDR Potash Mine & Mill	Pine Valley	Utah	201405	201505	PINE VALLEY GRASSROOT IN-SITU RECOVERY POTASH MINE & MILL
$800,000,000	3								

Rio Mesa Solar Generating Station Competing Projects Craft Demand by Project: Power, OG&C, and Civil Rail Projects

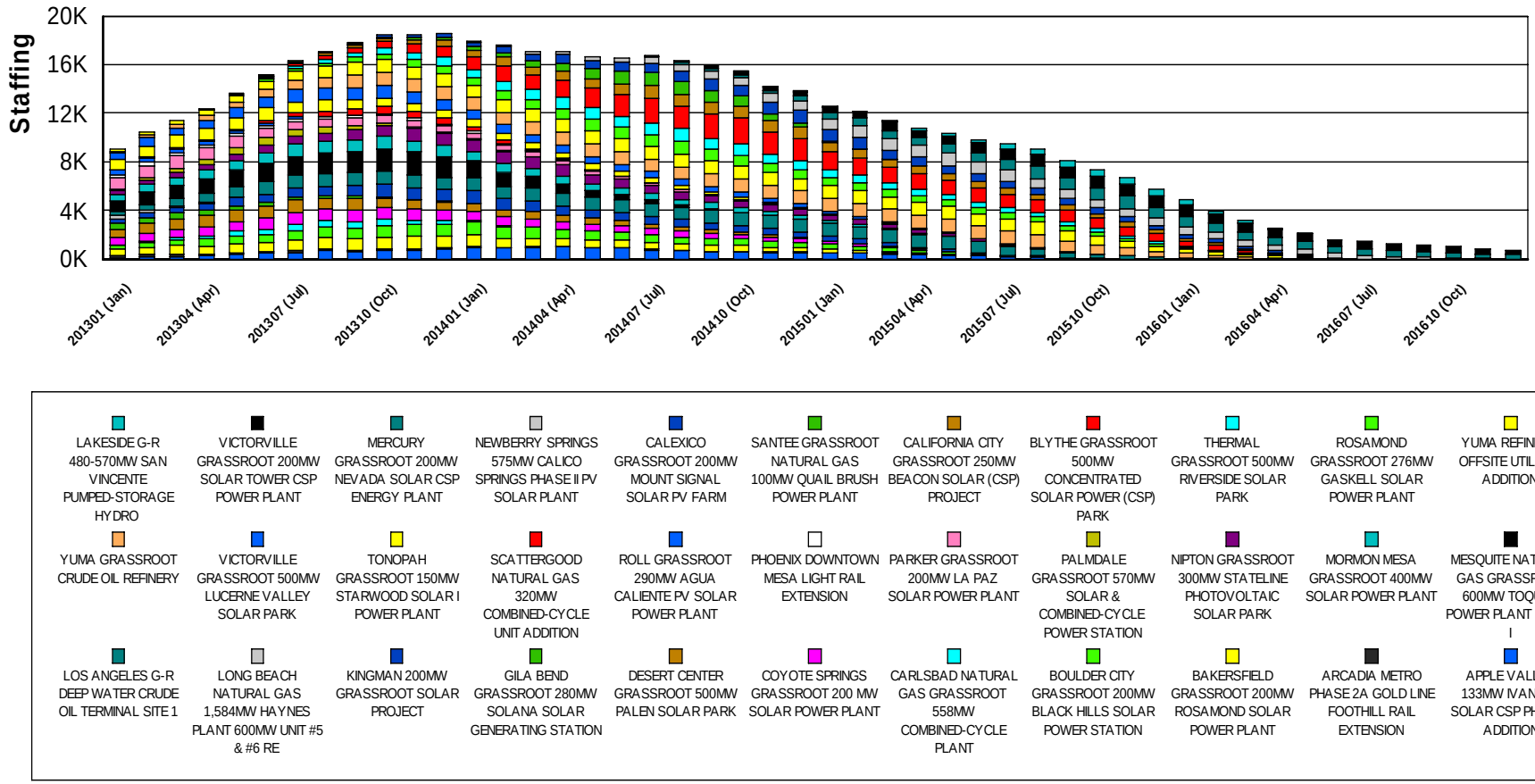


FIGURE TWO

Rio Mesa Solar Generating Station Competing Projects Craft Demand by Craft Type: Power, OG&C, and Civil Rail Projects

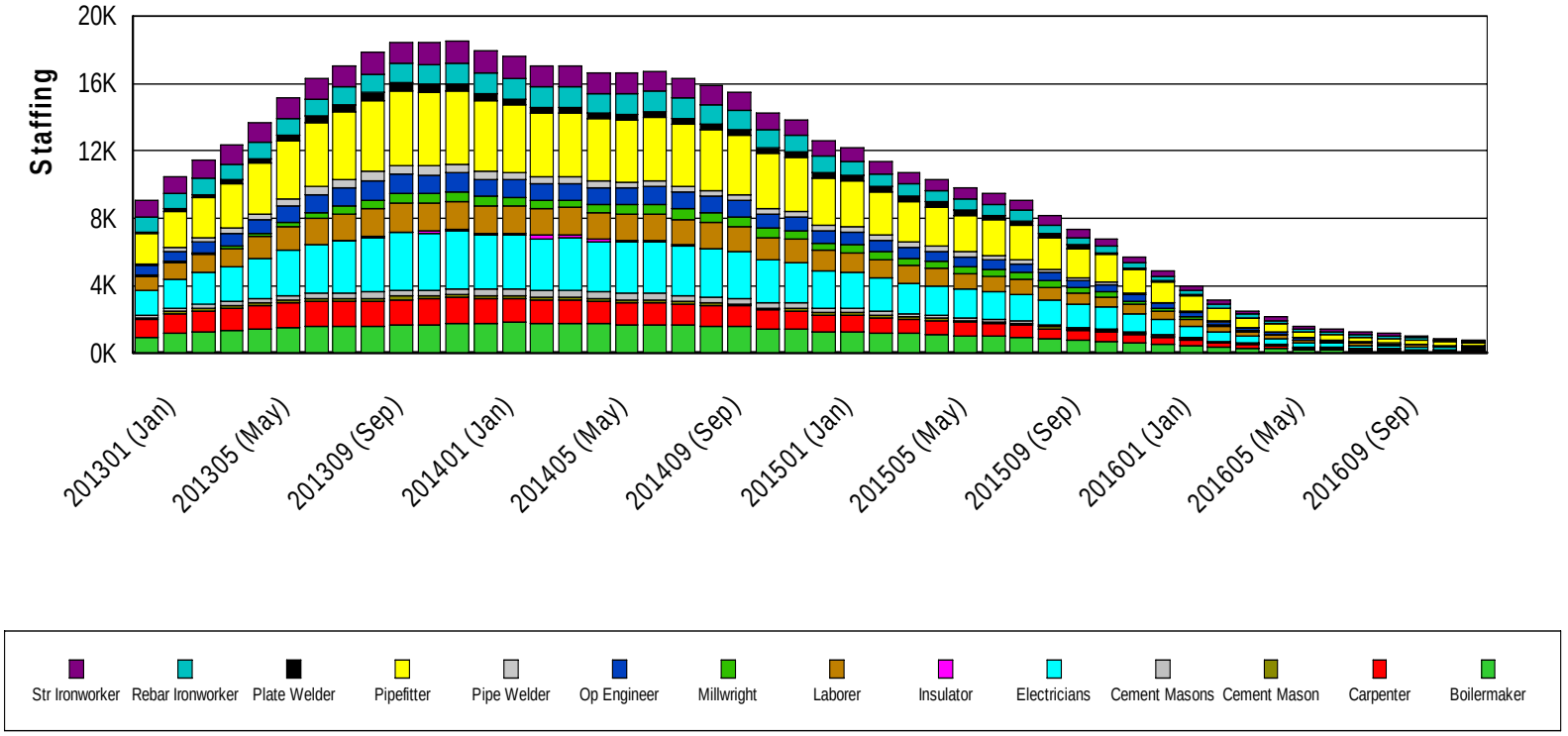


FIGURE THREE

SECTION SIX

HOUSING AVAILABILITY SURVEY

A survey of housing availability in Blythe was conducted in July 2011. The types of accommodations surveyed included: hotels and motels, RV Parks, apartments, home ownership and home rental. The majority of the surrounding communities are equal to or smaller in size, but there will be some housing possibilities in these areas and people may be able to commute from farther-away areas like Yuma, AZ, Palm Springs, etc. Because of the somewhat remote location of the Project, the availability of housing will impact the ability to attract qualified, skilled craft workers.

Blythe has some 15 hotels and motels, 7 RV parks and 13 apartment complexes that were identified during the survey. There may be more hotels, motels, and other living options but the following detailed listings represent the majority.

HOTELS AND MOTELS

HOTEL / MOTEL	TOTAL NO. OF ROOMS	DAILY RATE	MONTHLY RATE
California Inn	59	$69.00	Negotiable Longer stays - $59.00
Best Western - Sahara Motel	44	$89.00	Negotiable
Quality Inn	65	$80.00	Negotiable
Days Inn	56	$69.99 (1 king) $79.99 (2 beds)	Negotiable Construction rate - $64.95
Super 8	78	$59.99	Negotiable Commercial rate $49.99
Knights Inn	30	$60.00 (1 bed) $65.00 (2 beds)	No monthly rates Non-negotiable
Motel 6	92	$45.99 (1 adult) $51.99 (2 adults)	No monthly rates Weekly rates - $299.00 (1 adult), $319.00 (2 adults)
Capital Suites Hotel	67	$79.99 (1 bed) $89.99 (2 beds)	Negotiable
Americas Best Value Inn	50	$69.99 (1 bed) $79.99 (2 beds)	Negotiable
Rodeway Inn & Suites	35	$69.99 (1 bed) $79.99 (2 beds)	Negotiable Commercial Rates - $45.00 (1 bed), $50.00 (2 beds)
Regency Inn and Suites	50	$69.99 (1 bed) $79.99 (2 beds)	$59.99 (1 bed) / $69.99 (2 bed)
Blythe Inn	64	$44.00	No monthly rates Weekly rate $210.00
Oasis Motel	25	$35.00 (1 adult) $43.00 (2 adults)	Monthly rates - $500 (1 adult), $550 (2 adults)
Willow Inn and Suites	66	$39.99 (1 bed) $49.99 (2 beds)	Weekly rates available
Budget Inn	14	$35.00	No monthly rates

Blythe has fewer than 20 hotels/motels total. Each of these establishments were contacted and requested to provide information regarding overall capacity, daily rates and the availability of discounted rates for longer stays. Responses to this request are shown in the table above. The total number of rooms available at each of these establishments ranges from 14 to 92 with an average of 53 rooms at each location. These numbers include all types of room accommodations, such as one bed or two beds. The cheapest daily rate quoted was $35.00 with the most expensive being $89.99. Nearly all of the establishments offer pre-established or negotiable discounted monthly rates. Some of the hotels mentioned that they would match rates offered by other hotels in the area so long as the hotels were "comparable" in their offered levels of luxury.

RV PARKS

RV / TRAILER PARK	TOTAL NO. OF SITES	DAILY RATE	MONTHLY RATE	HOOKUPS	OTHER
Blythe / Colorado River KOA	200	$45.00	$399.00 plus electricity	Full hookups at every site (electricity / water / sewer / cable TV / wireless internet)	8 cabins available - sleep 4 (1 queen / 2 bunkbeds); refrigerator, stove, couch, recliner, porch, linens, pots and pans - $122 daily / $1400 month plus electricity
Destiny's McIntyre RV Resort	207	Not Available	$270.00 plus electricity (no sewer) / $305 plus electricity (with sewer)	38 sites full hookups (electricity / water /sewer); all other sites have electricity and water	
Hidden Beaches River Resort	24	$42.00 (2 adults / $5 per extra person)	$285.00 plus electricity (full hookup) / $375-$475 plus electricity (river front) / $350 plus electricity (pull through)	8 sites full hookups (electricity / water / sewer); 16 sites have electricity and water with a weekly sewer disposal service	Are a few homes on the premises that are available to rent - need to contact the owners directly
Mayflower County Park	185	$25.00 (water / electricity) - 6 people and 2 vehicles	$125.00 - weekly rate: maximum stay of two weeks b/c is a county park	130 - 140 sites (electricy / water / no sewer); 26 sites have no hookups; no sites have sewer, but is a dump area	
Burton's Mobile Home & RV	30 RV sites and 10 mobile homes for rent	RV - $25.00	$350.00 plus electricity (water / sewer / trash included)	30 RV spots have full hookups (electricity / water / sewer / trash)	10 mobile homes for rent - 1 bedroom $420.00 plus water, electricity, sewer; 2 bedrooms $450.00; 3 bedrooms $500; security deposit required if renting more than one month
Lost Lake Resort	34	$30.00	Winter Months - $220.00 plus electricity; summer months - $660 plus electricity	34 sites full hookups (water / electricity / sewer)	
Twin Palms Resort	23	$10.00 per day per person; $10.00 per day extra for electricity; extra $8.00 per dayfor sites offering additional ammenities (shade cover, tables, etc.)	November 1st - April 1st, $175.00 plus electricity; all other time is at the daily rate	15 sites with water and electricity; 8 sites with full hookups that include sewer	Is a sewer dump located on the premises

An advantage of Blythe's location near the Colorado River is that there is a great deal of outdoor recreation available. As a result, there are several RV parks in the area offering sites with electrical, water and sewage hookups as well as discounted monthly rates. The disadvantage is that these parks tend to fill up during the summer months with some raising their rates during this time of year. The information in the table above is for RV parks in the Blythe area. Similarly, many of the surrounding communities in close proximity to Blythe also have RV parks.

APARTMENTS

APARTMENT NAME	TOTAL NO. OF APARTMENTS	TOTAL NO. AVAILABLE	RATES	LEASE INFORMATION
Bayfield Apartments	60	9	2 bedroom 1 bath - $665/$715 3 bedroom 2 bath $745/$795	1 year lease / month to month
Palm Drive Apartments	79	20	Studio - $450 1 bedroom - $550 2 bedroom $650 3 bedroom $750	12 months / 6 months / month to month (50% and 25% off first month with 12 or 6 month lease)
Blythe Villa Apartments	52	0	Section 8 housing	Section 8 housing
Stardust Apartments	32	0	Studio - $350 1 bedroom - $450 2 bedroom - $525	month to month only
Sunrise Apartments	50	0	Section 8 housing	Section 8 housing
Quail Place	58	0	Section 8 housing	Section 8 housing
Silsby Gardens Apartment	51	0	Section 8 housing	Section 8 housing
Bel Air Apartments	20	5	1 bedroom - $600 2 bedroom $650	month to month only
Villa Monterey	80	10	2 bedroom - $545 3 bedroom - $645 4 bedroom - $685	12 months only
Broadway Manor Apartments				
Blythe Ocean View Apartments				
Rhyolite Apartments				
Rio Colorado Apartments				

There are several apartment complexes located in the Blythe area. Many of these are section 8 housing, meaning that they are rented to low income tenants. Qualification for this type of housing is determined by a person's annual income and certain set maximum limits. Currently there are no apartments of this type available with some complexes reporting three year waiting lists. Likely these complexes will not apply to any of the craft working on the Project.

Of the non-section 8 apartments surveyed, all reported 25% or less availability. Rates for these apartments are based on the floor plan with a two (2) bedroom ranging from $525 - $715 per month. Most of the complexes offer different lease options including

month to month, 6 months and 12 months. Some of the complexes listed in the table above were non-responsive to the survey.

HOMES – OWNERSHIP AND RENTALS

Sue Kalakosky of Century 21 Osborne Realty was contacted regarding the availability of housing in Blythe. Currently, she reports that there are 79 active home listings. The average price of a 1,300 to 1,400 square foot home built after 1990 with three (3) bedrooms and two (2) baths is $120,000. This would be for a non-ranch style home, located in a newer and more desirable neighborhood. Currently, the most expensive home available has on-the-water property and lists at $499,000.

When asked about current trends in home rentals, Sue stated that a lot of people are choosing to rent rather than own. The average price for the type of three (3) bedroom two (2) bath home described above is around $1,000 per month. The typical homes constructed prior to 1990 in Blythe (older, ranch-style homes), rent for around $800 to $900 per month.

The Ivanpah Experience

The above information is a handy reference especially when you look at the experience at the Ivanpah project. There are four hotels within 17 miles of the project, one in Jean, NV and three in Primm, NV, with a total of 3,100 hotel rooms. It is estimated by project personnel that something approaching 400 of the current payroll totaling 500 craft employees are staying at these hotels. The primary motivation for this is the daily room charge starting at $20 per night. Other reasons to stay in these establishments are the close proximity to the job site and lastly there are restaurants in the hotels, as well as in Las Vegas. Bechtel does not have a business relationship with the hotels but we do maintain clear communications as part of our community relations. The hotels have told us that they will keep the low rates as long as the people behave themselves. And, so far so good!

SECTION EIGHT

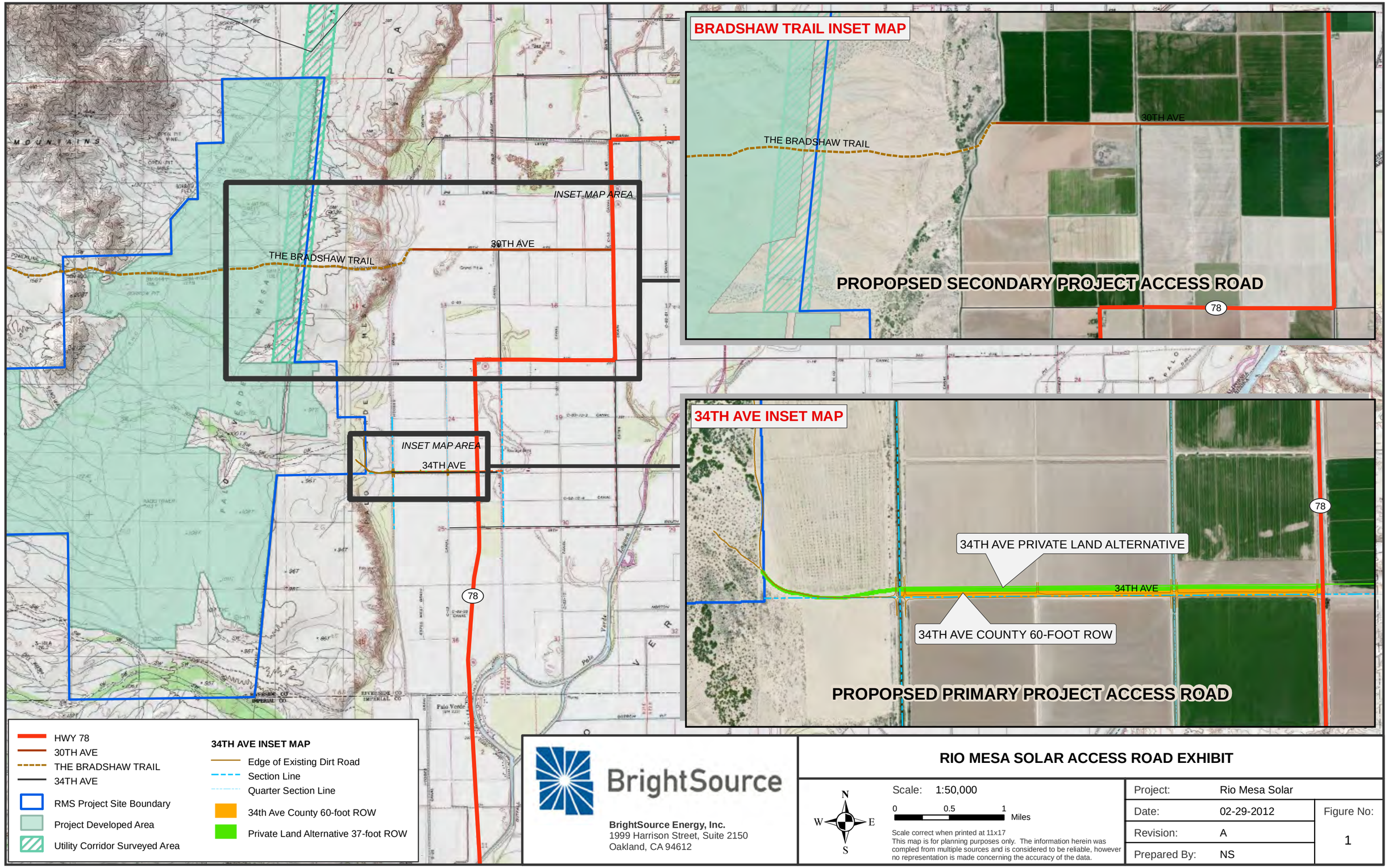
CRAFT REFERENCES

Asbestos Workers, #5 670 East Foothill Blvd., Unit 2 Azuza, CA 91702 Phone: (626) 815-9794 Fax: (626) 815-0165 Email: awlocal5@aol.com Business Manager: Freddy Montoya Business Agents: Felix Garcia	**Laborers, #1184** 1128 E. LaCadena Drive Riverside, CA 92507 Phone: (909) 684-1484 Fax: (909) 779-1445 Email: msdea@laborers1184.com Business Manager: Mike Quevedo, Jr. Business Agents: Mike Dea
Boilermakers, #92 2260 Riverside Avenue Bloomington, CA 92316-8318 Phone: (909) 877-9382 Fax: (909) 877-8318 Business Manager: Mark Thomas Business Agents: Jay Rojo, Jeff Gleason	**Millwrights, #1607** 932 S. Gerhart Avenue Los Angeles, CA 90022 Phone: (323) 724-0178 Fax: (323) 724-3844 Business Manager: John Foster Business Representative: Jim Pester Business Representative: BJ Hayden
Carpenters, #944 2040 North Mt. Vernon Avenue San Bernardino, CA 92411 Phone: (909) 887-2524 Fax: (909) 880-3724 Business Manager: B. J. Hayden Business Representative: George Wright	**Operating Engineers, #12** 150 E. Corson Avenue Pasadena, CA 91103 Phone: (626) 792-8900 Fax: (626) 792-9039 Business Manager: Bill Waggoner President: Mickey Adams Vice president: Ron Sikorski District Representative: Carl Mendenhall
Cement Masons, #500 P.O. Box 6497 Santa Ana, CA 92706 Phone: (714) 554-0730 Fax: (714) 265-0780 Business Manager: Jaime Barton Business Agents: Alfred Martinez, Phil Salerno, Jeff Higham	**Painters #775, District Council #36** 1074 East La Cadena Drive, Suite 4 Riverside, CA 92501 Phone: (951) 786-0612 Fax: (951) 786-0713 Business Manager: Grant Mitchell Business Agent: Alex Lopez
Electricians, #440 1405 Spruce Street, Suite G Riverside, CA 92507 Phone: (951) 684-5665 Fax: (909) 369-9032	**Pipefitters, #364** 223 S. Rancho Avenue Colton, CA 92324 Phone: (909) 825-0359 Fax: (909) 824-8362

Email: bob@ibew440.org Business Manager: Robert C. Frost President: Robert Roper	Business Manager: Richard Edwards
Iron Workers, #433 17495 Hurley Street East City of Industry, CA 91744 Phone: (626) 964-2500 Fax: (626) 964-1919 Business Manager: Doug Williams Business Agents: Robert Hunter, Johnny O'Kane, Ernesto Penuelas, Tom Moxley, Piedmont Brown, James McGuire, Robert Conway, Gabe Villareal	**Sheet Metal Workers, #105** 2120 Auto Center Drive Suite 105 Glendora, CA 91740 Phone: (909) 305-2800 Fax: (909) 305-2822 Email: smwia@local105.org Website: www.local105.org Business Manager: Roy Ringwood Business Agents: Sam Hurtado, Joseph Whitcher, Bill Shaver, Richard Foss, Steve Hinson, Rocky Pelliccino, David Shaver
Iron Workers, #416 P.O. Box 1166 Norwalk, CA 90651-1166 Phone: (562) 868-1251 Fax: (562) 868-1429 Business Manager: Hart Keeble Business Agents: Marco Frausto, Gregory Padilla, Richard Greenhagen, Robert Alexander, and Danny Grayman	**Teamsters, #36** 4626 Mercury Street San Diego, CA 92111-2410 Phone: (858) 292-7344 Fax: (858) 292-0179 Business Manager: Arthur Cantu

ATTACHMENT DR 34-1

ACCESS ROAD ALTERNATIVES



BrightSource

BrightSource Energy, Inc.
1999 Harrison Street, Suite 2150
Oakland, CA 94612

RIO MESA SOLAR ACCESS ROAD EXHIBIT

N W E S

Scale: 1:50,000

0 0.5 1 Miles

Scale correct when printed at 11x17

This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	Rio Mesa Solar
Date:	02-29-2012
Revision:	A
Prepared By:	NS

Figure No: 1

ATTACHMENT DR 35-1

FORM 7460-1 NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION – OFF AIRPORT:

SOLAR TOWER UNIT 1

Federal Aviation Administration

« OE/AAA

Notice of Proposed Construction or Alteration - Off Airport

Project Name: BRIGH-000190665-11 **Sponsor:** BrightSource Energy, Inc.

Details for Case : Unit 1

Show Project Summary

Case Status

ASN:	2011-AWP-7516-OE	**Date Accepted:**	11/16/2011
Status:	Add Letter	**Date Determined:**	
		Letters:	02/15/2012 ADD
			01/05/2012 CIR
		Documents:	None
			Project Documents: None

Construction / Alteration Information

Notice Of:	Construction
Duration:	Permanent
if Temporary :	**Months:** **Days:**
Work Schedule - Start:	
Work Schedule - End:	

For temporary cranes-Does the permanent structure require separate notice to the FAA? To find out, use the Notice Criteria Tool. If separate notice is required, please ensure it is filed. If it is not filed, please state the reason in the Description of Proposal.

State Filing:

Structure Summary

Structure Type:	Solar Tower
Structure Name:	Unit 1
NOTAM Number:	
FCC Number:	
Prior ASN:	

Structure Details

Latitude:	33° 27' 5.85" N
Longitude:	114° 46' 51.75" W
Horizontal Datum:	NAD83
Site Elevation (SE):	369 (nearest foot)
Structure Height (AGL): ** If the entered AGL is a proposed change to an existing structure's height include the current AGL in the Description of Proposal.*	820 (nearest foot)
Requested Marking/Lighting:	None
Other :	
Recommended Marking/Lighting:	
Current Marking/Lighting:	N/A New Structure
Other :	
Nearest City:	Blythe
Nearest State:	California
Description of Location: *On the Project Summary page upload any certified survey.*	South of Blythe, CA
Description of Proposal:	Solar Tower project in Riverside County, CA.

Common Frequency Bands

Low Freq	High Freq	Freq Unit	ERP	ERP Unit

Specific Frequencies

ATTACHMENT DR 35-2

FORM 7460-1 NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION – OFF AIRPORT:

SOLAR TOWER UNIT 2

Federal Aviation Administration

« OE/AAA

Notice of Proposed Construction or Alteration - Off Airport

Project Name: BRIGH-000190665-11 **Sponsor:** BrightSource Energy, Inc.

Details for Case : Unit 2

Show Project Summary

Case Status

ASN:	2011-AWP-7517-OE	**Date Accepted:**	11/16/2011
Status:	Add Letter	**Date Determined:**	
		Letters:	02/15/2012 ADD
			01/05/2012 CIR
		Documents:	None
			Project Documents: None

Construction / Alteration Information

Notice Of:	Construction
Duration:	Permanent
if Temporary :	**Months:** **Days:**
Work Schedule - Start:	
Work Schedule - End:	

For temporary cranes-Does the permanent structure require separate notice to the FAA? To find out, use the Notice Criteria Tool. If separate notice is required, please ensure it is filed. If it is not filed, please state the reason in the Description of Proposal.

State Filing:

Structure Summary

Structure Type:	Solar Tower
Structure Name:	Unit 2
NOTAM Number:	
FCC Number:	
Prior ASN:	

Structure Details

Latitude:	33° 27' 59.05" N
Longitude:	114° 47' 36.89" W
Horizontal Datum:	NAD83
Site Elevation (SE):	413 (nearest foot)
Structure Height (AGL): ** If the entered AGL is a proposed change to an existing structure's height include the current AGL in the Description of Proposal.*	820 (nearest foot)
Requested Marking/Lighting:	None
Other :	
Recommended Marking/Lighting:	
Current Marking/Lighting:	N/A New Structure
Other :	
Nearest City:	Blythe
Nearest State:	California
Description of Location: *On the Project Summary page upload any certified survey.*	South of Blythe, CA
Description of Proposal:	Solar Tower project in Riverside County, CA.

Common Frequency Bands

Low Freq	High Freq	Freq Unit	ERP	ERP Unit

Specific Frequencies

ATTACHMENT DR 35-3

FORM 7460-1 NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION – OFF AIRPORT:

SOLAR TOWER UNIT 3

Federal Aviation Administration

« OE/AAA

Notice of Proposed Construction or Alteration - Off Airport

Project Name: BRIGH-000190665-11 **Sponsor:** BrightSource Energy, Inc.

Details for Case : Unit 3

Show Project Summary

Case Status

ASN:	2011-AWP-7518-OE	**Date Accepted:**	11/16/2011
Status:	Add Letter	**Date Determined:**	
		Letters:	02/15/2012 ADD
			01/05/2012 CIR
		Documents:	None
			Project Documents: None

Construction / Alteration Information

Notice Of:	Construction
Duration:	Permanent
if Temporary :	**Months:** **Days:**
Work Schedule - Start:	
Work Schedule - End:	

For temporary cranes-Does the permanent structure require separate notice to the FAA? To find out, use the Notice Criteria Tool. If separate notice is required, please ensure it is filed. If it is not filed, please state the reason in the Description of Proposal.

State Filing:

Structure Summary

Structure Type:	Solar Tower
Structure Name:	Unit 3
NOTAM Number:	
FCC Number:	
Prior ASN:	

Structure Details

Latitude:	33° 29' 31.57" N
Longitude:	114° 46' 13.29" W
Horizontal Datum:	NAD83
Site Elevation (SE):	386 (nearest foot)
Structure Height (AGL): ** If the entered AGL is a proposed change to an existing structure's height include the current AGL in the Description of Proposal.*	820 (nearest foot)
Requested Marking/Lighting:	None
Other :	
Recommended Marking/Lighting:	
Current Marking/Lighting:	N/A New Structure
Other :	
Nearest City:	Blythe
Nearest State:	California
Description of Location: *On the Project Summary page upload any certified survey.*	South of Blythe, CA
Description of Proposal:	Solar Tower project in Riverside County, CA.

Common Frequency Bands

Low Freq	High Freq	Freq Unit	ERP	ERP Unit

Specific Frequencies

ATTACHMENT DR 36-1

FAA DETERMINATION: SOLAR TOWER UNIT 1

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
2601 Meacham Boulevard
Fort Worth, TX 76137

Aeronautical Study No.
2011-AWP-7516-OE

Issued Date: 02/22/2012

Nick Jacobs
BrightSource Energy, Inc.
1999 Harrison Street
Suite 2150
Oakland, CA 94612

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Tower Unit 1
Location:	Blythe, CA
Latitude:	33-27-05.85N NAD 83
Longitude:	114-46-51.75W
Heights:	369 feet site elevation (SE)
	820 feet above ground level (AGL)
	1189 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, a med-dual system - Chapters 4,8(M-Dual),&12.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part I)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part II)

See attachment for additional condition(s) or information.

Any height exceeding 820 feet above ground level (1189 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 08/22/2013 unless:

(a) extended, revised or terminated by the issuing office.

(b) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 23, 2012. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted in triplicate to the Manager, Airspace Regulations & ATC Procedures Group, Federal Aviation Administration, Airspace Regulations & ATC Procedures Group, 800 Independence Ave, SW, Room 423, Washington, DC 20591.

This determination becomes final on April 02, 2012 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Regulations & ATC Procedures Group via telephone -- 202-267-8783 - or facsimile 202-267-9328.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Karen McDonald, at (310) 725-6557. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2011-AWP-7516-OE.

Signature Control No: 153737436-159428262 (DNH)
Sheri Edgett-Baron
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Case Description
Map(s)

The sponsor is filing for a Solar Tower (Unit 1) located in Riverside County, California.

The site is located approximately 10.54 nautical miles (NM) southwest of the Blythe (BLH) airport reference point. BLH is the closest civilian public-use landing area, and has a Field Elevation of 399 feet above mean sea level (amsl). The site elevation of this structure is 369 feet amsl.

The structure height exceeds the obstruction standards of Title 14 Code of Federal Regulations (CFR), Part 77 as follows:

Section 77.17(a)(1) by 321 feet, a height more than 499 feet above ground level (agl), at the site.

Details of the proposal were circularized as Public Notice on 01/05/2012 in order to gather aeronautical information. No Objections or Comments were received from the Public Notice.

AERONAUTICAL STUDY FOR POSSIBLE EFFECT UPON THE OPERATION OF AN AIR NAVIGATION AID:

- None.

AERONAUTICAL STUDY FOR POSSIBLE INSTRUMENT FLIGHT RULES (IFR) EFFECT DISCLOSED THE FOLLOWING:

- The structure would have no effect on any existing or proposed IFR arrival/departure routes, operations, or procedures.

- The structure would have no effect on any existing or proposed IFR en route routes, operations, or procedures.

- The structure would have no effect on any existing or proposed IFR minimum flight altitudes.

AERONAUTICAL STUDY FOR POSSIBLE VISUAL FLIGHT RULES (VFR) EFFECT DISCLOSED THE FOLLOWING:

- The structure would have no effect on any existing or proposed VFR arrival or departure routes, operations or procedures.

- The structure would not conflict with airspace required to conduct normal VFR traffic pattern operations at any known public use or military airports.

- The structure would not penetrate those altitudes normally considered available to airmen for VFR en route flight.

- The structure shall be installed with a medium dual obstruction lighting system, in accordance with the sponsor's preference, to make it conspicuous to airmen flying in VFR weather conditions.

The cumulative impact of the structure, when combined with other existing structures is not considered significant. Study did not disclose any adverse effect on existing or proposed public-use or military airports or navigational facilities. Nor would the structure affect the capacity of any known existing or planned civilian public-use or military airport.

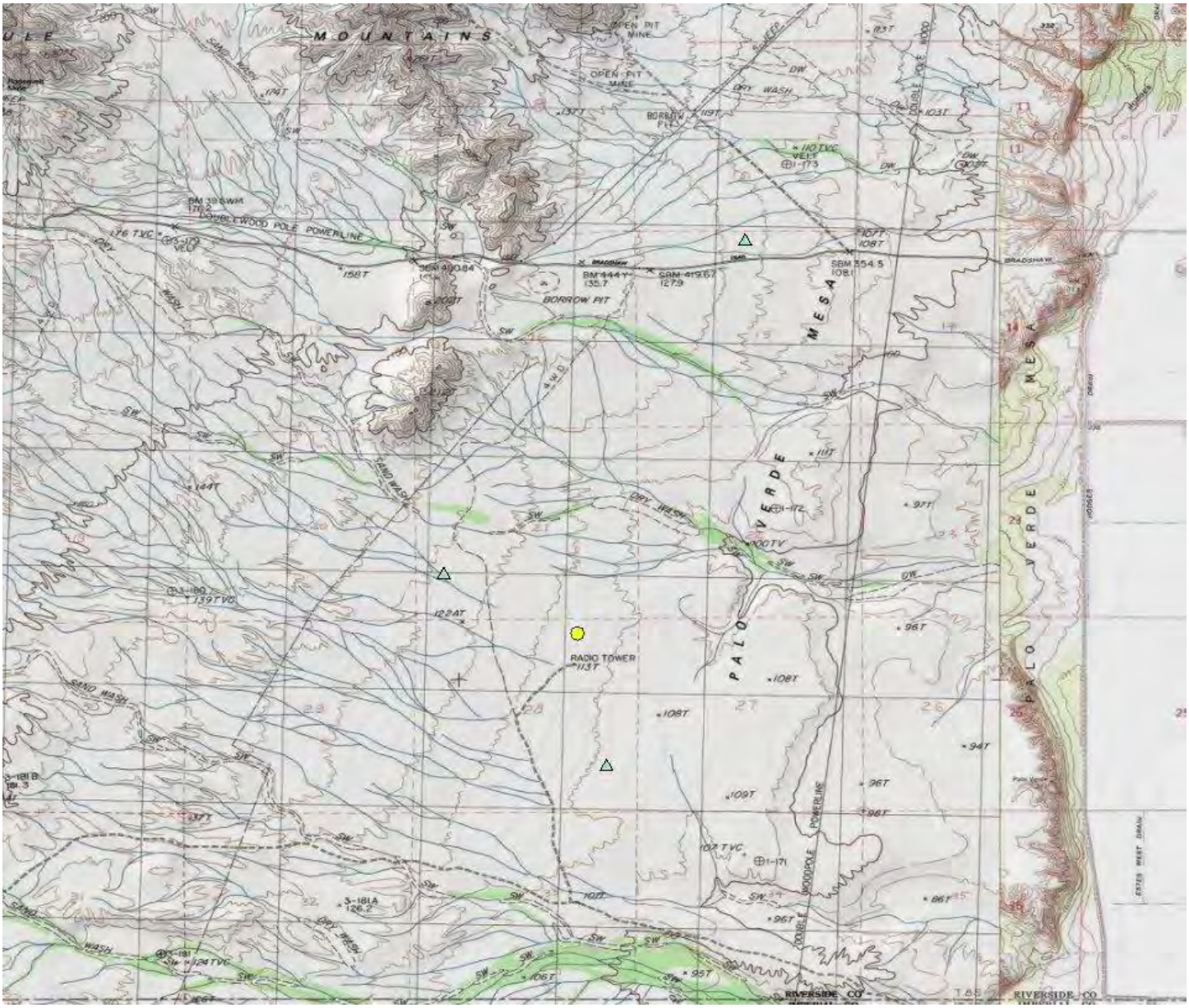
Therefore, it is determined that the structure would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation.

This determination, issued in accordance with Part 77, concerns the effect of the structure on the safe and efficient use of the navigable airspace by aircraft and does not relieve the sponsor of any compliance responsibilities relating to laws, ordinances, or regulations of any Federal, state, or local governmental bodies.

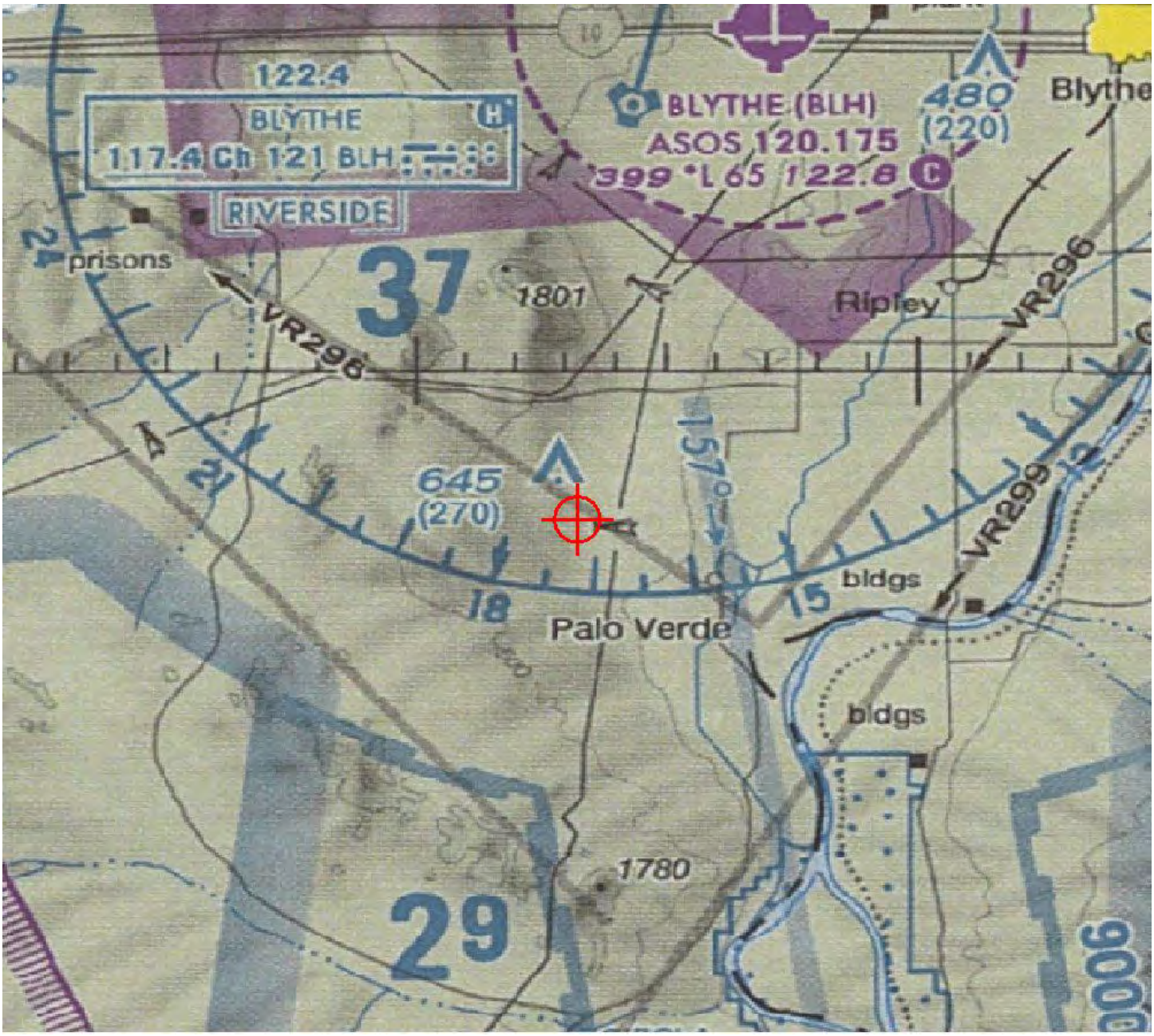
Determinations, which are issued in accordance with Part 77, do not supersede or override any state, county, or local laws, avigation easements, or ordinances, or local zoning maximum heights.

Solar Tower project in Riverside County, CA.

Verified Map for ASN 2011-AWP-7516-OE



Sectional Map for ASN 2011-AWP-7516-OE



ATTACHMENT DR 36-2

FAA DETERMINATION: SOLAR TOWER UNIT 2

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
2601 Meacham Boulevard
Fort Worth, TX 76137

Aeronautical Study No.
2011-AWP-7517-OE

Issued Date: 02/22/2012

Nick Jacobs
BrightSource Energy, Inc.
1999 Harrison Street
Suite 2150
Oakland, CA 94612

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Tower Unit 2
Location:	Blythe, CA
Latitude:	33-27-59.05N NAD 83
Longitude:	114-47-36.89W
Heights:	413 feet site elevation (SE)
	820 feet above ground level (AGL)
	1233 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, a med-dual system - Chapters 4,8(M-Dual),&12.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part I)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part II)

See attachment for additional condition(s) or information.

Any height exceeding 820 feet above ground level (1233 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 08/22/2013 unless:

(a) extended, revised or terminated by the issuing office.

(b) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 23, 2012. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted in triplicate to the Manager, Airspace Regulations & ATC Procedures Group, Federal Aviation Administration, Airspace Regulations & ATC Procedures Group, 800 Independence Ave, SW, Room 423, Washington, DC 20591.

This determination becomes final on April 02, 2012 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Regulations & ATC Procedures Group via telephone -- 202-267-8783 - or facsimile 202-267-9328.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Karen McDonald, at (310) 725-6557. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2011-AWP-7517-OE.

Signature Control No: 153737438-159428313 (DNH)
Sheri Edgett-Baron
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Case Description
Map(s)

The sponsor is filing for a Solar Tower (Unit 2) located in Riverside County, California.

The site is located approximately 9.92 nautical miles (NM) southwest of the Blythe (BLH) airport reference point. BLH is the closest civilian public-use landing area, and has a Field Elevation of 399 feet above mean sea level (amsl). The site elevation of this structure is 413 feet amsl.

The structure height exceeds the obstruction standards of Title 14 Code of Federal Regulations (CFR), Part 77 as follows:

Section 77.17(a)(1) by 321 feet, a height more than 499 feet above ground level (agl), at the site.

Details of the proposal were circularized as Public Notice on 01/05/2012 in order to gather aeronautical information. No Objections or Comments were received from the Public Notice.

AERONAUTICAL STUDY FOR POSSIBLE EFFECT UPON THE OPERATION OF AN AIR NAVIGATION AID:

- None.

AERONAUTICAL STUDY FOR POSSIBLE INSTRUMENT FLIGHT RULES (IFR) EFFECT DISCLOSED THE FOLLOWING:

- The structure would have no effect on any existing or proposed IFR arrival/departure routes, operations, or procedures.

- The structure would have no effect on any existing or proposed IFR en route routes, operations, or procedures.

- The structure would have no effect on any existing or proposed IFR minimum flight altitudes.

AERONAUTICAL STUDY FOR POSSIBLE VISUAL FLIGHT RULES (VFR) EFFECT DISCLOSED THE FOLLOWING:

- The structure would have no effect on any existing or proposed VFR arrival or departure routes, operations or procedures.

- The structure would not conflict with airspace required to conduct normal VFR traffic pattern operations at any known public use or military airports.

- The structure would not penetrate those altitudes normally considered available to airmen for VFR en route flight.

- The structure shall be installed with a medium dual obstruction lighting system, in accordance with the sponsor's preference, to make it conspicuous to airmen flying in VFR weather conditions.

The cumulative impact of the structure, when combined with other existing structures is not considered significant. Study did not disclose any adverse effect on existing or proposed public-use or military airports or navigational facilities. Nor would the structure affect the capacity of any known existing or planned civilian public-use or military airport.

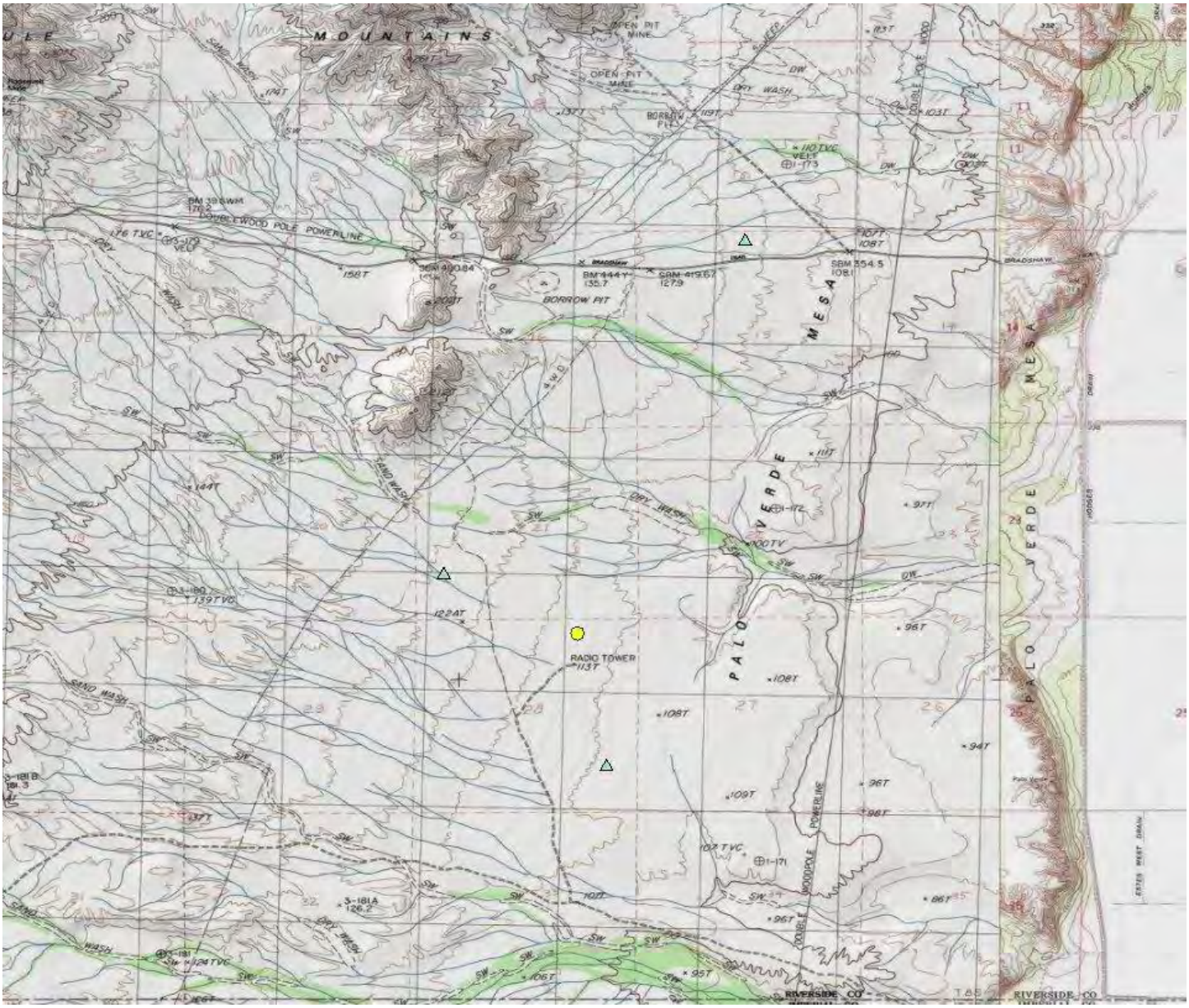
Therefore, it is determined that the structure would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation.

This determination, issued in accordance with Part 77, concerns the effect of the structure on the safe and efficient use of the navigable airspace by aircraft and does not relieve the sponsor of any compliance responsibilities relating to laws, ordinances, or regulations of any Federal, state, or local governmental bodies.

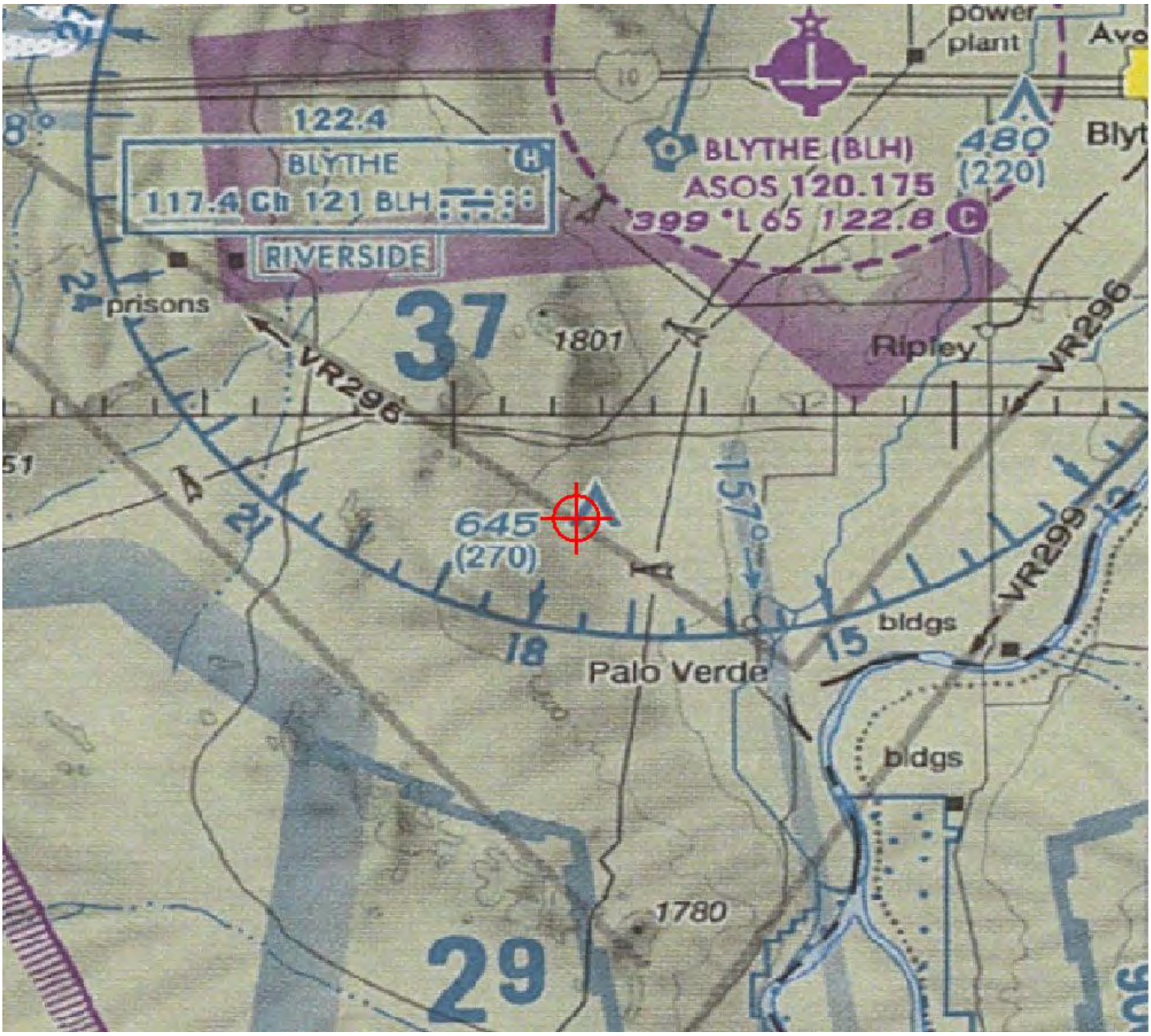
Determinations, which are issued in accordance with Part 77, do not supersede or override any state, county, or local laws, avigation easements, or ordinances, or local zoning maximum heights.

Solar Tower project in Riverside County, CA.

Verified Map for ASN 2011-AWP-7517-OE



Sectional Map for ASN 2011-AWP-7517-OE



ATTACHMENT DR 36-3

FAA DETERMINATION: SOLAR TOWER UNIT 3

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
2601 Meacham Boulevard
Fort Worth, TX 76137

Aeronautical Study No.
2011-AWP-7518-OE

Issued Date: 02/22/2012

Nick Jacobs
BrightSource Energy, Inc.
1999 Harrison Street
Suite 2150
Oakland, CA 94612

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Tower Unit 3
Location:	Blythe, CA
Latitude:	33-29-31.57N NAD 83
Longitude:	114-46-13.29W
Heights:	386 feet site elevation (SE)
	820 feet above ground level (AGL)
	1206 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, a med-dual system - Chapters 4,8(M-Dual),&12.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part I)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part II)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Any height exceeding 820 feet above ground level (1206 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 08/22/2013 unless:

(a) extended, revised or terminated by the issuing office.
(b) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 23, 2012. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted in triplicate to the Manager, Airspace Regulations & ATC Procedures Group, Federal Aviation Administration, Airspace Regulations & ATC Procedures Group, 800 Independence Ave, SW, Room 423, Washington, DC 20591.

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This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Karen McDonald, at (310) 725-6557. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2011-AWP-7518-OE.

Signature Control No: 153737440-159428491 (DNH)
Sheri Edgett-Baron
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Case Description
Map(s)

The sponsor is filing for a Solar Tower (Unit 3) located in Riverside County, California.

The site is located approximately 8.07 nautical miles (NM) southwest of the Blythe (BLH) airport reference point. BLH is the closest civilian public-use landing area, and has a Field Elevation of 399 feet above mean sea level (amsl). The site elevation of this structure is 386 feet amsl.

The structure height exceeds the obstruction standards of Title 14 Code of Federal Regulations (CFR), Part 77 as follows:

Section 77.17(a)(1) by 321 feet, a height more than 499 feet above ground level (agl), at the site.

Details of the proposal were circularized as Public Notice on 01/05/2012 in order to gather aeronautical information. No Objections or Comments were received from the Public Notice.

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- None.

AERONAUTICAL STUDY FOR POSSIBLE INSTRUMENT FLIGHT RULES (IFR) EFFECT DISCLOSED THE FOLLOWING:

- The structure would have no effect on any existing or proposed IFR arrival/departure routes, operations, or procedures.

- The structure would have no effect on any existing or proposed IFR en route routes, operations, or procedures.

- The structure would have no effect on any existing or proposed IFR minimum flight altitudes.

AERONAUTICAL STUDY FOR POSSIBLE VISUAL FLIGHT RULES (VFR) EFFECT DISCLOSED THE FOLLOWING:

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- The structure would not conflict with airspace required to conduct normal VFR traffic pattern operations at any known public use or military airports.

- The structure would not penetrate those altitudes normally considered available to airmen for VFR en route flight.

- The structure shall be installed with a medium dual obstruction lighting system, in accordance with the sponsor's preference, to make it conspicuous to airmen flying in VFR weather conditions.

The cumulative impact of the structure, when combined with other existing structures is not considered significant. Study did not disclose any adverse effect on existing or proposed public-use or military airports or navigational facilities. Nor would the structure affect the capacity of any known existing or planned civilian public-use or military airport.

Therefore, it is determined that the structure would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation.

This determination, issued in accordance with Part 77, concerns the effect of the structure on the safe and efficient use of the navigable airspace by aircraft and does not relieve the sponsor of any compliance responsibilities relating to laws, ordinances, or regulations of any Federal, state, or local governmental bodies.

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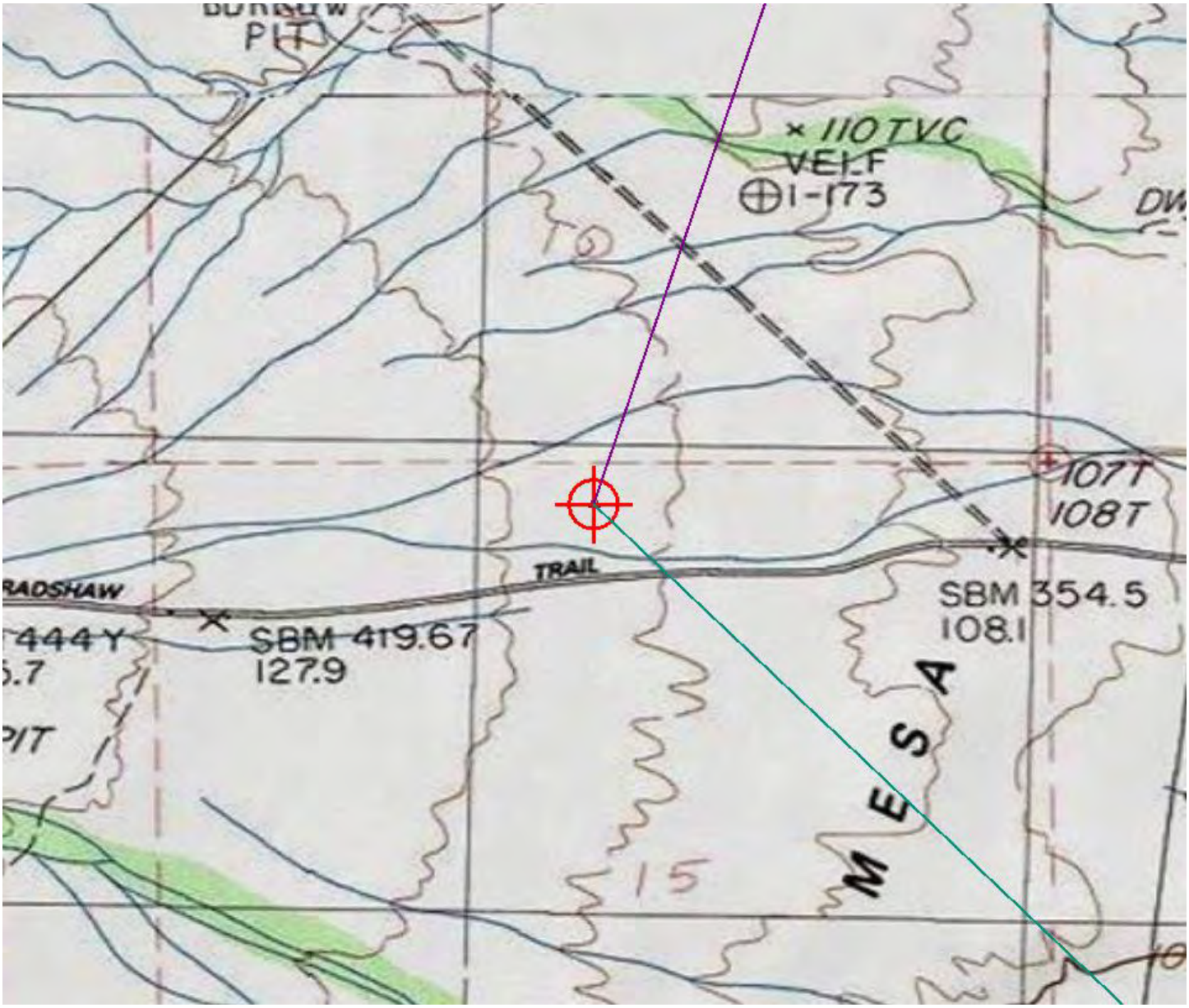
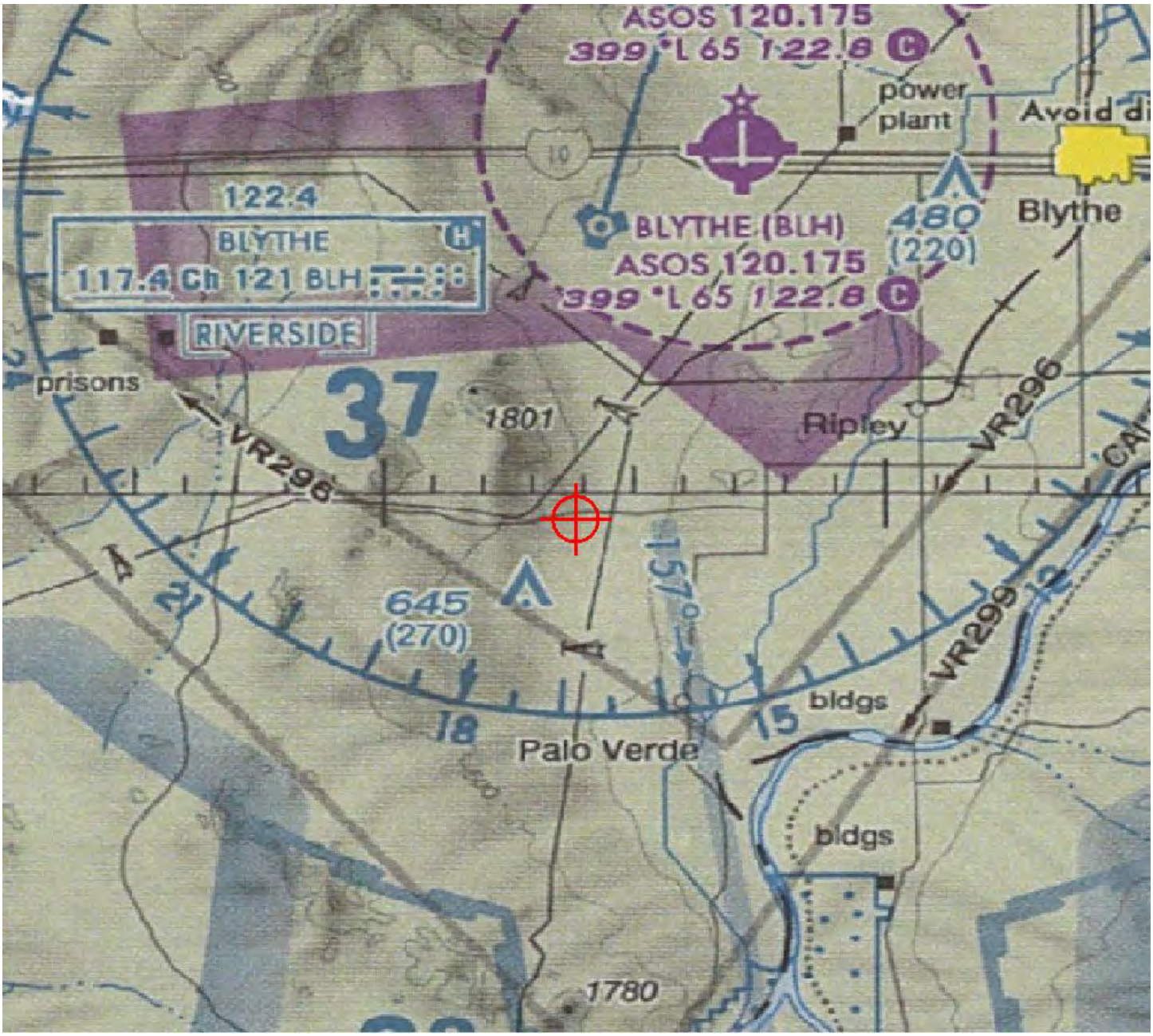
Solar Tower project in Riverside County, CA.

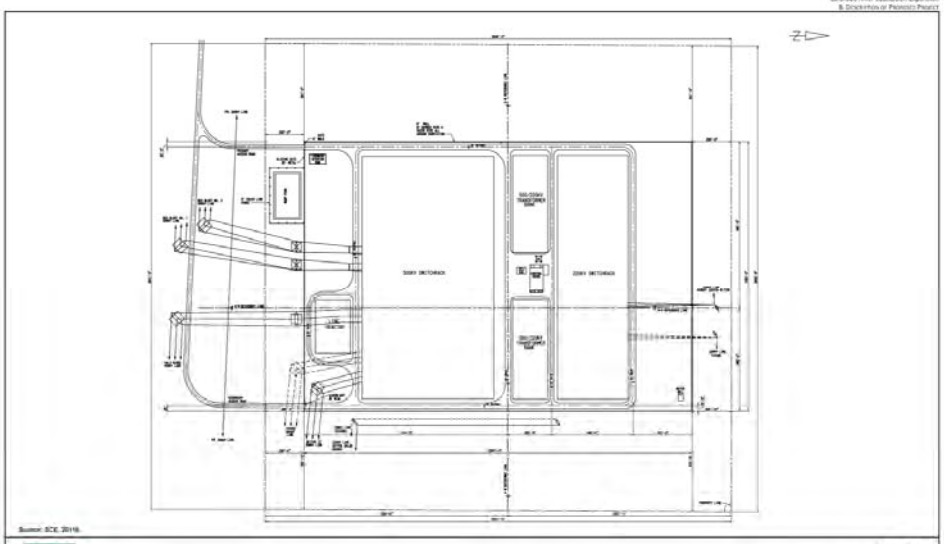

PIT
× 110 TVC
VELF
⊕1-173
107T
108T
TRAIL
SBM 354.5
108.1
SBM 419.67
127.9
MESA
15

Sectional Map for ASN 2011-AWP-7518-OE



ATTACHMENT DR 39-1

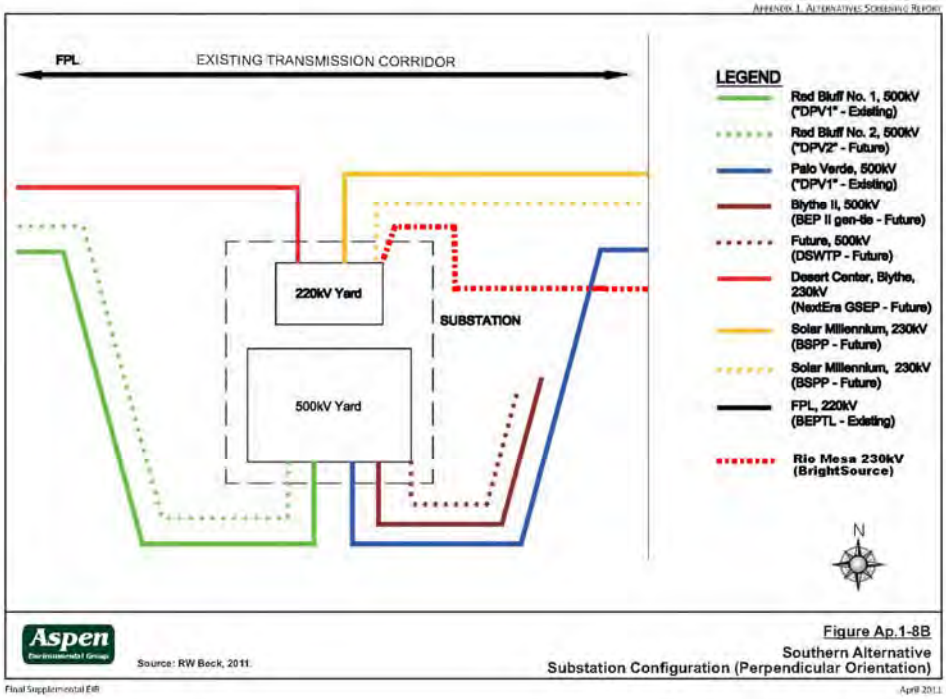
SUBSTATION LAYOUT AND SOUTHERN ALTERNATIVE SUBSTATION CONFIGURATION



Source: SCE, 2010.

Aspen Environmental Group

Figure B-2a
Substation Layout



Aspen Environmental Group

Source: RW Beck, 2011.

Figure Ap.1-8B
Southern Alternative
Substation Configuration (Perpendicular Orientation)

ATTACHMENT DR 49-1

WILEY'S WELL CAMPGROUND AERIAL PHOTO

Wiley's Well Campground

SOURCES:

Microphyll Woodland

WILEY WELL CAMPGROUND
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

URS

162.5 0 162.5 325 Feet

SCALE: 1" = 325' (1:3,900)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DT	DATE: 2/16/2012	FIG. NO: BAT2
PM: AL	PROJ. NO: 27651003.20040	

Path: \\S082-GIS-01\gis\gis\projects\V577\27651002\map_docs\mxd\BioWiley_Well_Road_Campground.mxd, David_Trzeciak, 2/16/2012

DRAFT - Internal Planning Use Only

ATTACHMENT DR 49-2

ELF OWL HABITAT PHOTOS AT WILEY'S WELL













ATTACHMENT DR 49-3

ELF OWL SURVEY AREA

SOURCES: Layers (URS)
Aerial (NAIP 2010, 04-28-2010)

ELF OWL WITH FENCELINE/POWERBLOCKS
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

URS

1000 0 1000 2000 Feet

SCALE: 1" = 2000' (1:24,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: GN	DATE: 2/21/2012	FIG. NO: 1
PM: AL	PROJ. NO: 27651003.20040	

- Microphyll Woodland
- 500-foot Fenceline Buffer
- Draft Fenceline Boundary of Solar Field (approx. 5,526 acres)
- Draft Usable Boundary of Common Areas (approx. 119 acres)
- Project Site (approx. 7,529 ac.; approx. acres: 5,604 MWD, 1,615 BLM, 310 Private)
- Bradshaw Trail
- Elf Owl Survey Areas (approx. 263.2 acres)
- Gila woodpecker 2011 Sightings

Path: \\S082-GIS-01\gis\gis\projects\1577\27651002\map_docs\mxd\Bio\Elf_Owl_Survey_Area_T.mxd, Gabor_Nagy, 2/21/2012

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ATTACHMENT DR 52-1

TABLE OF BAT SPECIES IN PROJECT AREA

Bats Potentially Occurring Near the Rio Mesa Solar Project

Family/Scientific Name	Common Name	USFWS	CDFG	BLM
Chiroptera (Bats)				
Phyllostomatidae (American leaf-nosed bats)				
Macrotus californicus	**California leaf-nosed bat**	-	CSC	S
Myotis yumanensis	**Yuma myotis**	-	-	S
Myotis velifer	**Cave myotis**	-	CSC	S
Myotis occultus	**Arizona myotis**	-	CSC	-
Myotis californicus	**California myotis**	-	-	-
Pipistrellus hesperus	**Western pipistrelle**	-	-	-
Eptesicus fuscus	**Big brown bat**	-	-	-
Lasiurus blossevillii	**Western Red bat**	-	CSC	-
Lasiurus xanthinus	**Southern yellow bat**	-	-	-
Lasiurus cinereus	**Hoary bat**	-	-	-
Corynorhinus townsendii	Townsend's big-eared bat	-	CSC	S
Antrozous pallidus	**Pallid bat**	-	CSC	S
Molossidae (Free-tailed bats)				
Tadarida brasiliensis	**Mexican free-tailed bat**	-	-	-
Nyctinomops femorosaccus	**Pocketed free-tailed bat**	-	CSC	-
Nyctinomops macrotis	Big free-tailed bat	-	CSC	-
Eumops perotis	**Western mastiff bat**	-	CSC	S

Acronyms:

USFWS **=** U.S. Fish and Wildlife Service
CDFG = California Department of Fish and Game
BLM = U.S. Bureau of Land Management
CSC = California Species of Special Concern
S = BLM Sensitive

Bold = Could be impacted by project
Red = Special status species to be impacted

ATTACHMENT DR 52-2

BAT HABITAT MAP

Category	Acres
Microphyll Woodland Within 3-mile Radius	3,508
Microphyll Woodland Within Draft Fenceline Boundary and 3-mile Radius	823

- Mine Location
- Microphyll Woodland (Potential Bat Foraging Habitat)
- Extent of Habitat Mapping
- 3-mile Radius from Roost Mines (25,832 Acres)
- Draft Fenceline Boundary of Solar Field (approx. 5,526 acres)
- Draft Usable Boundary of Common Area (approx. 119 acres)
- Project Site (approx. 7,539 ac.; approx. acres: 5,604 MWD, 1,625 BLM, 310 Private)
- Proposed Project 230 kV Gen-tie Line Right-of-Way Corridor - approx. 115 ac. (100 ft. corridor, 50ft. from c/l; approx acres: 80 BLM, 35 Private)
- Newly Approved Colorado River Substation (77 ac.)
- Assumed Tie-in Area for Newly Approved Colorado River Substation (approx. 124 ac.)
- County Boundary
- City/Town
- Bradshaw Trail

10

Hodge Mine

Roosevelt Mine

Bradshaw Trail

Palo Verde

SOURCES: Project Site (VTN, 3-15-2011). Transmission Line Centerline, Transmission Line Corridor (Power Engineers, 8-2011). CRS Substation, Potential Gen-tie Area (Aspen, 3-11-2011). Aerial Imagery (Bing Maps, 2011). County,Bradshaw Trail, Highway (ESRI, 2007). Bat Habitat, Mines, 3-mile Radius (URS, 2011).

POTENTIAL BAT FORAGING HABITAT
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

URS

0.5 0 0.5 1 Miles

SCALE: 1" = 1 mile (1:63,360)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DT	DATE: 12-28-11	FIG. NO: 1
PM: AL	PROJ. NO: 27651003.20110	

Path: \\S082-GIS-01\gis\gisprojects\V577\27651002\mxd_docs\mxd\BioMxd\Bat_Habitat_Map.mxd, David_Trzeciak, 1/5/2012, 1:37:27 PM

ATTACHMENT DR 59-1

DRAFT INJURY & ILLNESS PREVENTION PROGRAM

Injury & Illness Prevention Program

REVISIONS			
REV	**DESCRIPTION**	**BY**	**DATE**
A	Initial Draft Release	S. Keyes	

> **Note**: The official document may change from time to time. When using a hardcopy, please verify that you have the most updated revision.

APPROVALS for Rev _			Restriction: Confidential & Proprietary
	Name	**Date**	**Signature**
Document Owner	S. Keyes		

DRAFT

BrightSource

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DRAFT

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DRAFT

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1. INTRODUCTION

1.1. Purpose

The purpose of this document is to outline the written BSCM Injury and Illness Prevention Program (IIPP) for Rio Mesa Solar Project Operations. The welfare of our employees, contractors, visitors and members of the public, as well as the protection of corporate property is a major consideration in our business.

Accident Prevention and Property Protection is a responsibility of all employees, and contractors of BSCM. The Project Director and Safety Health & Environmental (SH&E) Manager are primarily responsible for accident prevention at all sites. Since the ultimate responsibility for performance lies with the individual, all members of the BSCM team are required to participate in the accident and property protection effort.

The procedures outlined in this program will be implemented for all operations throughout the project where any work is conducted and a copy of this written program will be maintained at each worksite.

1.2. Scope/Applicability

This program, which has been voluntarily adopted by BSCM, applies to all work performed on the Rio Mesa Solar site. Employees and other workers shall at all times be governed by the standards of this program. This IIPP is intended to meet or exceed the OSHA (including CAL-OSHA) regulations as referenced in this document. Please note that in the case of inconsistency between any provisions of this Program, the more stringent requirement shall be applied. For example, where BSCM's own procedures require more than the OSHA regulations reprinted in this program, BSCM's greater requirement will govern. Please note, however, that to the extent BSCM's requirements are more stringent than those of OSHA, BSCM has adopted those requirements for business reasons only, and does not thereby assume any obligation that is greater than the applicable requirements set forth in OSHA.

The IIPP for the Rio Mesa Solar project will consist of the following elements:

- Responsibilities and duties
- Compliance
- Communication
- Hazard assessment

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- Injury/Illness investigation
- Hazard correction
- Safety briefings
- Recordkeeping

1.3. Definitions & Abbreviations

Definitions	

Abbreviations	
BSCM	BrightSource Construction Management
IIPP	Injury & Illness Prevention Program
OSHA	Occupational Safety & Health Administration
SH&E	Safety Health & Environmental

1.4. Applicable Documents

1.4.1. Specific Documents

The following documents form a part of this document as referenced herein.

Doc Number	Doc Title
TBD	Accident Management Procedure

1.4.2. Standards

The following documents form a part of this document as referenced herein.

Doc Number	Doc Title

1.5. Responsibilities

This policy is administered by the Bright Source Construction Management Safety Health Environmental Department.

1.5.1. Project Director and SH&E Manager

General Responsibilities: The on-site Project Director and SH&E Manager are responsible for overall management and administration of this IIPP. He or she may seek the assistance of other management personnel for assistance in implementing elements contained in this program. The on-site Project Director and SH&E Manager are responsible for:

- Being familiar with the Injury and Illness Prevention Program, safety rules and policies applicable to their area of responsibility.
- Posting required worksite safety and emergency action documentation (including contact information) at each remote worksite, and maintaining a copy of the Injury and Illness Prevention Program available, on site, to all employees, and contractors reporting to the worksite. BSCM Administrative Office
- Communicating and enforcing safety rules and policies with employees, contractors and visitors, including advising them that they can report hazards without fear of reprisal.
- Checking that employees, contractors and visitors receive appropriate safety briefings and are qualified for their work, receive safety briefings as appropriate, and are informed of worksite safety policies.
- Ensuring that all accidents are properly investigated and documented and that appropriate corrective actions are implemented.
- Taking appropriate steps so that all injuries, no matter how minor, are treated properly and in a timely manner and that any necessary paperwork has been completed and submitted.
- Periodically performing inspections of the operations and worksite to identify unsafe conditions or work practices and taking appropriate steps so that corrective action occurs.
- Taking appropriate steps so that safety concerns are addressed and unsafe conditions are reported and corrected in a timely manner.
- Keeping the BSCM SH&E Manager informed of safety concerns and activities.

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- Documenting attendance at safety meetings and the receipt of required written materials by employees and contractors.
- Acting as liaison with governmental agencies.

SH&E Manager – Site Specific Responsibilities: The on-site SH&E Manager is responsible for completing the following tasks prior to any work operations:

- Survey: Prior to any work on site, management personnel should perform the following tasks or develop standard operating procedures for dispatched crews to do the following: Inspect proposed work areas, positions for existing and potential hazards, e.g., power lines, unstable ground and exposure to hazardous materials.

> NOTE: Employee and contractor safety will be a prime consideration.

- Obtain appropriate local emergency numbers and applicable state or federal OSHA posters. These may include medical assistance, fire and police departments, and others as appropriate.
- Determine needs and order appropriate personal protective and other safety equipment. These may include safety harnesses, railings, lanyards, hearing protectors, fire protection, security fencing, and other equipment as appropriate.

> Note: A #3 Type Classified Safety Lenses per OSHA requirements for flash and light source shall be worn once the heliostats start production and during operations).

- Determine needs and order appropriate items to protect the public from danger from our equipment and to protect our equipment from physical hazards, and inclement weather.
- Between Survey & On Site Mobilization: During the period between the site survey and on site mobilization, management personnel should:
- Discuss appropriate safety standards and specifications with our contractors. These may include requirements for scaffolding, forklifts, mobile equipment, roads, access, cranes, signs, stairways, security, training and other applicable requirements.
- Obtain or verify receipt of certificates of insurance from contractors.
- Ensure continuing re-surveys of the site when changes are anticipated that could affect safe operations.
- Contact BSCM SH&E Manager if assistance is required.

- On site work: Prior to any on site set-up phase of an operation, management personnel should:
- Ensure that all employees and contractors are informed of the safety requirements at this site. Safety briefings should be documented and include information about the health and safety hazards posed by operations at this site, use of personal protective equipment, injury reporting and emergency procedures, and specialized safety briefings for workers who engage in potentially hazardous work.
- Enter emergency telephone numbers on the "Emergency Action Plan" form. That information, along with the appropriate state or federal OSHA poster should be posted in a conspicuous place for employee and contractor information.
- Establish security for the all work areas and outlying equipment. Inspect all work areas and outlying areas as per the guidelines to verify that potential hazards are addressed.
- Ensure continuing safety inspections as conditions change to look for changes that could affect safe operations at the site.
- Employees and contractors are also responsible for site operations health and safety including the following:
- Complying with all aspects of the IIPP.
- Complying with additional information given through safety meetings, information published on informational sheets, postings and safety awareness briefings by their supervisors.
- Adhering to all company policies and procedures relating to job safety, including both general safe work rules and task-specific rules and regulations.
- Reporting unsafe conditions and injuries to their supervisor immediately.

1.5.2. Safety Health and Environmental Manager:

The SH&E Manager is responsible for the overall administration of the IIPP.

- Provide general safety briefings to managers, employees and contractors
- Provide guidance when new or unusual safety and health concerns arise
- Coordinate and/or conduct safety inspections
- Issue reports on findings
- Maintain records of inspections

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1.6. Safety Health and Environmental Emergency Contact Listing:

Mike Bobinecz, Project Director
(510) 219-0846-Mobile

Steve Keyes, SH&E Manager
(760) 490-3268-Mobile

Doug Davis, Environmental Compliance Manager
(702) 239-6118-Mobile

> NOTE: Violations of safety rules and policies may result in disciplinary action in accordance with policy, up to and including discharge. Management shall be responsible to enforce these rules and policies.

1.7. Communications

Matters concerning occupational safety and health will be communicated to employees and contractors by written documentation, meetings, formal and informal safety briefings, and posting.

Safety Meetings: In order to identify and evaluate work site hazards, safety meetings are to be held during pre-work meetings with appropriate personnel as often as necessary to ensure adequate communication of safety and health information with employees and contractors. Documentation of these meetings will be maintained by management.

The purpose of these meetings is to identify and discuss foreseeable production hazards and safety issues and to develop strategies to control or eliminate them. Additional safety meetings should be scheduled as necessitated by any changes in the production schedule.

A safety awareness meeting must be conducted for new employees and contractors as locations change and new potential hazards are introduced, and whenever new equipment and/or procedures are implemented.

Reporting of Potential Safety Issues: Communications from employees and contractors to supervisors about suspected unsafe or unhealthy conditions is encouraged and may be verbal or written, as the individual chooses.

Employees and contractors will be afforded the opportunity to report safety concerns anonymously.

1.8. No Retaliation Policy:

Employees, contractors and visitors must be able to express their concerns regarding health and safety matters if they so choose, without fear or reprisal. If at any time any employee or contractor voices a concern about their health, safety or related issue, corrective action must be taken immediately if the situation warrants, or handled promptly if it is not an emergency. **There will be no retaliation against any employee, contractor or visitor for reporting hazards or potential hazards or for making suggestions related to safety.**

2. THE PROCESS

2.1. Hazard Assessment

The on-site SH&E Manager will inspect each site prior to set-up for potential hazards and environmental concerns or other unsafe conditions and will work with the appropriate personnel to handle them accordingly. Periodic inspections to ensure a safe work environment and to identify unsafe conditions are also required.

Inspections will also occur whenever new substances, processes, procedures or equipment are introduced in the workplace that present a new occupational safety and health hazard and whenever any member of management is made aware of a new or previously unrecognized hazard.

2.2. Injury/Illness Investigation

All work-related injuries and illnesses must be reported to the direct supervisor of the employee or contractor and to the medical personnel on duty immediately. An Injury/Illness Investigation Report must be completed by the supervisor and submitted to the BSCM SH&E Manager within 24 hours.

Injury/illness investigations will be conducted in accordance with the guidelines contained in the Accident Management Procedures section of this document.

Any work-related injury or illness that results in the hospitalization or death of an employee or contractor requires the immediate notification of BSCM. The BSCM Management shall then contact the appropriate Health and Safety Department representative.

2.3. Hazard Correction

Unsafe or unhealthy conditions, work practices and work procedures will be corrected in a timely manner based upon the severity of the hazard. The on-site SH&E Manager will take such corrective action.

When an imminent danger hazard exists which cannot be immediately abated without endangering employees or contractors and/or property, all exposed personnel will be removed from the area except those necessary to correct the existing condition. Employees or contractors necessary to correct the hazardous condition shall be provided the necessary safeguards.

2.4. Safety Briefings

Appropriate safety briefings will be provided to all new employees and contractors. Additional safety briefings will be provided whenever employees or contractors are given new job assignments for which a safety briefing has not previously been received; whenever new substances, processes, procedures or equipment are introduced to the workplace and present a new hazard; and, whenever management is made aware of a new or previously unrecognized hazard.

Supervisors have been and will continue to be briefed to familiarize them with the safety and health hazards to which employees or contractors under their immediate direction and control may be exposed.

2.5. Recordkeeping

Records of hazard assessments, inspections, corrective actions, safety briefings, injuries/illnesses, incident investigations and other safety-related correspondence will be maintained by the on-site SH&E Manager.

The BSCM Safety, Health and Environmental Department will maintain documentation of safety and health safety briefings attended by each employee or contractor, including name or other identifier, safety briefing dates, type(s) of safety briefing, and safety briefing providers. These records shall be maintained for three years.

The BSCM SH&E Manager will also keep the various other forms and records which are referred to throughout the IIPP.

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3. GENERAL HEALTH AND SAFETY INFORMATION

3.1. Emergency Action Plan:

Prior to set-up, Management personnel must develop a site-specific emergency action plan. The Emergency Action plan must include Procedures for:

- Reporting a fire or other emergencies.
- Emergency evacuation, including type of evacuation and exit route assignments. The rally areas and alternate locations should also be included.
- Employees or contractors who must remain for critical operations before they evacuate. Accounting for all employees, and contractors after evacuation.
- Employees or contractors performing rescue or medical duties.
- Who to contact if employees and contractors under the plan need more information.
- Management personnel must review the emergency action plan with each employee and contractor upon initial assignment and during set-up at each remote work area. A “Site Emergency Action Plan” will be posted at all work sites to inform employees and contractors of site-specific emergency procedures. The plan shall be posted in a readily visible location.
- OSHA: The Occupational Safety and Health Act, is enforced by the federal Occupational Safety and Health Administration (OSHA) or a state-run regulatory agency in states that have adopted their own occupational safety and health programs.
- Duties of employers, employees and contractors: Each employer under OSHA has the general duty to furnish everyone under its control with a "safe work environment free from hazards causing, or likely to cause, death or serious physical harm."
- The employer has the specific duty of complying with safety and health standards under OSHA.
- Each employee, contractor and visitor has the duty to comply with these safety and health standards and all rules, regulations and orders issued pursuant to OSHA, which are applicable to his own actions and conduct.
- Occupational Safety and Health Standards: OSHA incorporates an extensive array of standards into law. These standards are divided into the following categories.

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- Workplace Standards: The basic safety and health standards, which apply specifically to the workplace, include such things as fire protection, housekeeping, illumination, sanitation, walking and working surfaces, ventilation and marking physical hazards.
- If We Have An OSHA Inspection: All BSCM workplaces, including all site activity, are subject to unannounced inspections by federal or state "Compliance Safety and Health Officers" (CSHOs). The following procedure is established to have the Compliance Safety and Health Officer properly received and accompanied on his inspection by a member of BSCM management:
- The CSHO is to be instructed to proceed to the office trailer.
- The CSHO's credentials should be checked out by the Project Director or SH&E Manager -- the CSHO must present government identification bearing his/her photograph and signed by the Labor Department.
- The Project Director or SH&E Manager should ask for a copy of the OSHA complaint or other inspection documentation.
- The Project Director and SH&E Manager will participate in the pre-inspection conference.
- The Project Director or SH&E Manager is expected to take notes.
- A copy of the BSMC Injury and Illness Prevention Program (IIPP), posters, and other evidence of good faith compliance should be provided to the CSHO if requested.
- Make an effort to correct hazards as they are pointed out.
- Discuss the inspection immediately afterward with the CSHO and note abatement periods.
- Instruct the CSHO to mail all correspondence to:
- Federal/State OSHA Workplace Safety Poster: OSHA (Occupational Safety and Health Administration) requires the posting of specific federal or state informational posters to inform employees and contractors of the protections and obligations provided for in the Occupational Safety and Health Act.
- These posters must be posted in each establishment in a conspicuous place or places where notices to employees and contractors are customarily posted.
- The SH&E Manager is required to post the appropriate poster and take steps to insure that such notices are not altered, defaced, or covered by other material for the duration of the event.

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- This information must be posted in a highly conspicuous area in a location that is frequented by all employees, and contractors such as the meal area, break room, central field office, etc.

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4. SAFETY POLICIES

4.1. Fall Prevention/Protection Policy

This section establishes guidelines relative to the Fall Prevention/Protection policy for BSMC. This section defines the practices and procedures used to protect employees and contractors required to work in areas where fall hazards are present or may occur.

These guidelines apply to all employees and contractors who must work from elevated surfaces, and to the design and operation of facilities where fall hazards are present or may occur. The BSMC Fall Prevention/Protection program has been developed to comply with fall protection requirements established by the Occupational Safety and Health Administration (OSHA). It is not the intent of this program to outline every requirement relative to fall prevention/protection. Therefore any fall prevention/protection questions not answered by this program should be forwarded to the BSMC SH&E Manager.

4.1.1. Work being performed from portable ladders

Hierarchy of Controls: BSMC will take all practical measures to eliminate, prevent and control fall hazards. Work sites and activities shall be surveyed to identify areas where fall hazards are present or may occur. Good fall prevention/protection control calls for a prioritized system to tackle foreseeable fall hazards. Sometimes used in combination, the following hierarchy is in order of importance:

- Eliminating fall hazards: Elimination of fall hazards is the first and best line of defense against falls from heights. If the hazard is eliminated, then workers are not put at risk. For example, if an employee and contractors can operate effectively from a ground level platform instead of a raised platform, the fall hazard has been effectively eliminated.
- Preventing fall hazards by guarding: Preventing fall hazards is the second line of defense when fall hazards cannot be entirely eliminated. This involves making changes to the workplace to eliminate the need for personal protective equipment or administrative techniques. Examples include providing same-level barriers, such as floors, walls, covers, guardrails, handrails and fall restraint systems to prevent the worker from direct and unprotected exposure to a fall hazard.
- Arresting falls: Arresting falls is the last line of defense. Fall arrest should be considered only after determining that the fall hazard cannot be eliminated or the possibility of fall prevented. This is the domain of fall protection devices, and calls for equipment such as:

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safety nets, harnesses, lanyards, shock absorbers, fall arresters, lifelines and anchorage connectors.

Management Responsibilities: The SH&E Manager is primarily responsible for ensuring that the Fall Prevention/Protection Program is implemented and enforced during all work hours. This responsibility includes the following:

- Ensuring all managers and supervisors who monitor and oversee the activities of employees and contractors exposed to fall hazards have successfully completed a fall protection safety briefing.
- Ensuring only employees and contractors who have completed a safety briefing in fall protection are allowed to work in areas where fall hazards are present or may occur.
- Conducting fall prevention/protection hazard assessments of locations.
- Providing the required personal fall protection equipment to employees and contractors prior to such work beginning. Providing and documenting job and/or area-specific safety briefings. Area-specific safety briefings shall be provided by a qualified/competent. At minimum, an area-specific fall protection safety briefing shall include:
- The nature of fall hazards in the work area.
- The correct procedures for maintaining and inspecting the fall protection systems to be used.
- The use and operation of guardrail systems, personal fall arrest systems, or other protection to be used.
- Management shall enforce the company policies when noncompliance is observed.

Employee and Contractors Responsibilities: Employees and contractors are responsible for the following:

- Attending and successfully completing safety briefings when assigned.
- Complying with the guidelines contained in this program and those specified by management.
- Using appropriate company issued fall protection equipment when working in areas where fall hazards are present or may occur.
- Personally inspecting the fall protection equipment prior to each use, and for notifying management whenever such equipment is in question, need of repair or replacement.
- Ensuring the proper care of fall protection equipment under their use and/or control.

- For ensuring that company issued equipment is returned to the company.

Health and Safety Responsibilities: The SH&E Manager is responsible for the following:

- Maintaining and administering the Fall Prevention/Protection Program.
- Assisting management with assessing operations and making determinations of the types and applications of Personal Fall Protection Systems/Equipment to be used by BSCM employees and contractors.
- Recommending and approving equipment vendors and specific fall protection equipment for use during BSCM operations.
- To provide on-site assessment, if practical, of work situations where the use and/or need for specific fall protection systems and equipment is in question.
- Exercising the authority to enforce the use of fall protection equipment when conducting worksite evaluations, inspections, or observations.

Operating Guideline: The following Fall Prevention/Protection Operating Guidelines must be followed during all work on the project.

> **CAUTION:** No employee or contractor shall work in areas where a fall hazard is present or may occur, or use fall protection equipment until they have completed a fall protection safety briefing.

- General: Standard guardrail systems or barrier walls are the primary means of protecting employees and contractors on elevated walking/working surfaces. When such systems are not present or feasible, employees and contractors shall use Personal Fall Arrest or Restraint Systems whenever they work within six (6) feet of an unprotected edge or in work situations outlined in this program.
- Body harnesses used in conjunction with a lanyard, lifeline and anchorage point are the only personal fall arrest equipment approved for use for all elevated work where there is a potential of fall greater than four (4) feet (or 30” in the state of California).
- Personal Fall Arrest System: Full body harness & lanyards are approved for use to restrain employees and contractors at elevated work locations where they are designed and installed to prevent employees and contractors from reaching an area (e.g. unprotected edge) where a fall could occur.
- Floors, Platforms, Scaffolds: All open sides of floors, floor openings, platforms, scaffold platforms, runways, and pits which are four (4) feet or more above a lower level (or 30”

in the state of California), will be guarded in accordance with OSHA requirements, by use of standard railings (or equivalent barrier).

- Platforms which have OSHA-compliant rails will require the appropriate application of a fall arrest system if any section of the top rail must be removed or lowered to accommodate work operations. Fall arrest equipment must be donned prior to removal of the top rail and it must meet the following requirements: The system must be attached to a substantial anchorage point capable of supporting at least 5,000 pounds;
- The complete system (harness, lanyard and connecting devices) must be able to prevent the employee or contractor from reaching the exposed edge of the platform;
- The fall arrest system must be employed before removing the top rail and at all times that the rail is down; and,
- The employee or contractor must have received a safety briefing on the application and limitation of a fall restraint system.
- Platforms may require the installation of a fall restraint anchor to meet the anchorage needs discussed above.
- Openings for ladder-ways that penetrate floors or platforms (floor openings) will be guarded by use of a standard railing with standard toe boards on all exposed sides (except at the entrance to the ladder opening) with the passage through the railing for the ladder provided with a self-closing swinging gate or so offset that a person cannot walk directly into the opening.
- Areas less than four (4) feet high will be guarded when adjacent to or over hazardous equipment or machinery. When installation of standard railings is not feasible due to physical limitations or operational restrictions, the following will apply: A permanent, conspicuous line (or other approved means of identification) will be applied on the working surface at a distance six (6) feet back from the unprotected edge(s), to identify a “Fall Hazard Zone”. Work performed inside of the “Fall Hazard Zone” requires the use of an approved Personal Fall Arrest System.
- Where work is performed within locations where it is not feasible or practical to apply floor markings six (6) feet back from an unprotected edge(s), employees and contractors shall be instructed to remain at least six (6) feet clear of open edges and to use appropriate fall protection equipment when working within this zone.
- Berms, Walls: Generally any work above ground level performed from these surfaces will be done through use of portable ladders, scaffolds, or aerial work platforms. When

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such devices cannot be used, appropriate fall protection equipment shall be used when the working surface is:

- Four (4) feet or more above a lower level (or 30" in the state of California), and
- The work requires access to within six (6) feet of an unprotected edge, or
- The surface has slope greater than 4 in 12 (vertical to horizontal) and which ends in a vertical edge that is four (4) feet or more above a lower level.
- The work required in the performance of maintenance requires that employees and contractors be protected from falls from stage or appurtenant stage surfaces which are four (4) feet or more above a lower level. This protection will be provided by either use of personal fall protection equipment, temporary work platforms or temporary guardrail systems. Fall protection is not required when such work is performed from portable ladders unless those ladders are within a fall hazard zone.
- Roofs: Personal Fall Arrest Systems shall be used on rooftops when:[the numbering looks off again below]
- Work is required to be performed within six (6) feet of an unprotected roof edge,
- When work is performed on any roof that has a slope greater than 4 in 12 (vertical to horizontal) and the height above a lower level is four (4) feet or greater, or
- When working within six (6) feet of an unguarded skylight.
- Use of a Personal Fall Arrest System is not required when simply stepping onto or off of a roof at a ladder or stair access point.

Vehicles and Watercraft: Employees and contractors working atop vehicles or watercraft where a fall hazard of more than four (4) feet (or 30" in the state of California) exists will be protected by appropriate fall protection equipment (e.g. Personal Fall Arrest System) attached to a certified anchorage point, or through use of temporary work platforms installed to prevent falls to a lower level. Flat bed trucks and trailers will require the use of full body harness and retractable devices.

Work Conducted Over Water: Employees and contractors fall protection during work conducted over water will be determined based on the greater of the hazard, the water or a fall. Where water is the greater hazard, employees and contractors shall be required to wear personal flotation devices (PFD) at all times during the work. Where the greater hazard is a fall, a Personal Fall Arrest System shall be used and secured to a certified anchorage point.

In some cases the use of a PFD and a Personal Fall Arrest System may be required. BSCM SH&E Manager should be contacted for guidance when work involves working over water.

Aerial Work Platforms: Generally speaking aerial work platforms include, but are not limited to, the following pieces of equipment:

- Bucket truckKnuckle high reach
- Scissors lift
- Vertical lift
- Employees and contractors working in aerial work platforms, excluding scissors lifts, are required to utilize approved Personal Fall Protection Equipment at all times.
- Employees and contractors working in scissors lifts that have the potential for the guardrails to be removed must have approved Personal Fall Protection Equipment readily available for use whenever the guardrails are removed.
- Lanyards of Personal Fall Arrest Systems shall only be attached to designated anchorage points installed by the manufacturer of the aerial work platform. Lanyards of Personal Fall Protection Equipment used for fall restraint may be attached to alternative locations as approved by the manufacturer.
- Safety Briefings: All supervisors who monitor and oversee the activities of employees and contractors exposed to fall hazards; specify and/or procure fall protection equipment; inspect and maintain fall protection equipment; and/or, provide on-site fall prevention/protection safety briefings, shall attend the Fall Protection safety briefing conducted by a SH&E Manager approved vendor or competent person.
- All employees and contractors whose role requires working within a fall hazard zone shall receive a job and/or area-specific fall protection safety briefing conducted in the local area by a qualified/competent person.
- All employees and contractors must receive safety briefings in the specific fall protection procedure to be followed on a given site. The SH&E Manager is responsible for ensuring employees and contractors have received instruction in fall protection procedures and proper use of fall protection equipment.
- No employee or contractor shall work in an area where a fall hazard is present or may occur until he/she has completed a fall protection safety briefing.
- Personal Fall Protection Equipment Inspection: Area management shall require a pre-use inspection of all Personal Fall Arrest and Fall Restraint System components.

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- All equipment that has been subjected to a “free fall” of any distance shall be immediately removed from service until they can be thoroughly inspected by a competent person. Inspections shall be conducted in accordance with the manufacturer recommendations for all pieces of equipment.
- Any fall protection equipment that does not meet the appropriate inspection parameters shall be immediately removed from service and permanently destroyed to prevent use.
- Pre-use visual inspection of Personal Fall Arrest System components and/or equipment shall include the following:
- Anchorage Point Inspection: Anchorage points shall be inspected visually by the user prior to each use. Should the pre-use inspection reveal any defect as noted below, the anchorage shall not be used. The following items shall be looked for during the anchorage point pre-use inspection:
- Bent, deformed, cracked, loose, or worn anchorage
- Damage to structure supporting the anchorage point
- If anchorage or supporting structure is of questionable strength (for any reason)
- Corrosion
- Harness Inspection: Harnesses shall be inspected visually by the user prior to each use. Should the pre-use inspection reveal any defect as noted below, the harness shall not be used. The following items shall be looked for during the pre-use inspection:
- Begin at one end, hold the body side of the harness toward you, grasping the harness straps with your hands six (6) to eight (8) inches apart.
- Bend the harness in an inverted “U.” Watch for frayed edges, broken fibers, pulled stitches, cuts or chemical damage.
- Check D-rings and D-ring metal wear pads for distortion, cracks, breaks, and rough or sharp edges.
- The D-ring bar should be at a 90-degree angle with the long axis of the belt or harness strap and should pivot freely.
- Attachment of buckles and D-rings should be given special attention. Note any unusual wear, frayed or cut fibers, or distortion of the buckles. Rivets should be tight and irremovable with fingers. Body side rivet base and outside rivets should be flat against the material.

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- Inspect for frayed or broken strands. Broken webbing strands generally appear as tufts on the webbing surface. Any broken, cut or burnt stitches should be readily seen.
- Buckle tongues should be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. Rollers should turn freely on the frame. Check for distortion or sharp edges.
- Inspect the friction buckle for distortion. The outer bar or center bars must be straight. Pay special attention to corners and attachment points of the center bar.
- Lanyard Inspection: Begin at one end and work to the opposite end. Slowly rotate the lanyard so that the entire circumference is checked. Spliced ends require particular attention. Hardware should be examined for cracks, corrosion, distortion, or pitted surfaces.
- Retractable Lifeline Inspection: Both permanently attached and portable retractable lifelines are available for use. Inspect the lifeline by slowly pulling it out to its full length to assure the cable or fabric is not frayed, kinked, or worn in any way. Test the braking mechanism by pulling down quickly on the lifeline to assure the brake catches and holds. Look for worn, broken or defective parts of the lifeline housing. Inspect for any deformities, cracks, or wearing of attachment point on the housing.
- Shock-Absorbing Pack Inspection: Examine the outer portion of the pack for burn holes and tears. Examine the stitching on areas the pack is sewn to the D-ring, belt or lanyard for loose strands, rips and deterioration.
- Snaphooks and Carabiners: Check to ensure that it operates freely and the keeper locks automatically when released. Inspect for signs of damage, any bent cracked, or distorted components. Units that do not pass this inspection or have been subjected to fall arresting forces must be removed from service.
- Restraint System Inspection: As applicable, inspections shall be conducted of all Restraint System components as those discussed above for Personal Fall Arrest Systems. Any piece of equipment which does not meet acceptable inspection parameters shall be immediately removed from service.

Violations: The requirements and associated responsibilities identified in this program are based on the requirements of the Occupational Safety and Health Administration (OSHA). Failure to meet these requirements could result in injury of personnel or public bystanders, damage to property or equipment, and/or monetary penalties from regulatory agencies.

Violations of this procedure represent violations of federal law and BSCM policy. BSCM

SH&E Policy, requires that appropriate corrective action, according to the company's disciplinary policy, be taken with respect to any employee or contractor who violates government health and safety regulations, company policies and procedures, or who fails to exercise proper care to ensure compliance with these procedures.

Definitions	
Anchorage Point	A secure point of attachment for lifelines, lanyards, or deceleration devices that is capable of supporting a 5000 pound load per person.
Body Harness	Straps that may be secured about the person in a manner that will distribute the fall arrest forces over the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system. Body harnesses must be approved by ANSI.
Competent Person	One who is capable delivering a safety briefing to help people to recognize existing and predictable fall hazards in the work area and to identify and utilize appropriate fall protection systems. Each competent person shall have successfully completed a fall protection safety briefing, area-specific fall hazard safety briefings and be totally knowledgeable about the fall hazards present in his/her work area(s).
Deceleration Device	Any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing and deforming lanyard, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on a person during fall arrest. Deceleration devices must be ANSI approved.
Fall Hazard Zone	Any portion of a walking/working surface located four (4) feet or more above a lower level (or 30" in the state of California) and within six (6) feet of an unprotected edge. An area in which a Personal Fall Systems or temporary guarding must be used in order for work to take place. This does not apply to steep roofs having a slope greater than 4 in 12 (vertical to horizontal), in which case, use of a Personal Fall Arrest System is always required.
Free-Fall	The act of falling from an elevated walking/working surface before a Personal Fall Arrest System begins to apply force to arrest a fall.
Guardrail System	A barrier erected to prevent a person from falling to lower levels from an elevated walking/working surface. As applicable, all guardrail systems shall be constructed to meet requirements outlined by the Occupational Safety and Health Administration (OSHA). In general, guardrails must be installed with the top rail between 39 and 42 inches high and a mid-rail at 21 inches high. Top guardrails must be able to

Definitions	
	withstand a force of 200 pounds applied in any direction.
Lanyard	A flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the full body harness to a deceleration device, anchorage, or lifeline. Lanyards must be ANSI approved.
Lifeline	A component consisting of a flexible line for connection to an anchorage at one end to hang vertically, or for connection to anchorage's at both ends to stretch horizontally, and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.
Low-Slope Roof	A roof having a slope less than or equal to 4 in 12 (vertical to horizontal).
Lower Levels	Those areas or surfaces to which a person can fall. Such areas or surfaces include, but are not limited to, ground levels, floors, platforms, ramps, runways, excavations, pits, tanks, material, water, equipment, structures, or portions thereof.
Personal Fall Arrest System	A system used to arrest a person in a fall. It consists of an anchorage point, connectors, and harness, and may include a lanyard, deceleration device, lifeline, or suitable combination of these. NOTE: BODY BELTS ARE NOT ACCEPTABLE AS PART OF A PERSONAL FALL ARREST SYSTEM.
Positioning Device System	A full-body harness rigged to allow a person to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning. NOTE: THE USE OF BODY BELTS AS PART OF A POSITIONING DEVICE SYSTEM IS PROHIBITED.
Restraint System	A fall prevention system consisting of a full body harness and a securing rope or cable lifeline, the intent of which is to prevent the wearer from getting to a point where they could fall. Restraint Systems shall be approved by the BSMC Health and Safety Department prior to installation and/or use.
Rope Grab	A deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of a person. A rope grab usually employs the principle of inertial locking, cam/lever locking, or both. Rope grabs must be ANSI approved.
Self-Retracting Lifeline/Lanyard	A deceleration device containing a drum wound line which can be slowly extracted from or retracted onto, the drum under slight tension during normal movement, and which, after the onset of a fall, automatically locks the drum and arrests the fall. Self-retracting lifelines must be ANSI approved.
Snap-hook (Double-action)	A connector comprised of a self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection. NOTE: THE USE OF ANY SNAPHOOK WITHOUT A DOUBLEACTION SELF-LOCKING

Definitions	
	KEEPER IS PROHIBITED.

4.2. Scaffolding Safety Policy

4.2.1. Operating Guidelines

The following scaffolding construction, maintenance and inspection Operating Guidelines must be followed during all work on the project.

4.2.2. Management Responsibilities

The SH&E Manager is primarily responsible for ensuring that the scaffold is erected, maintained and inspected in compliance with these guidelines and applicable OSHA requirements.

4.2.3. Scaffolding Erection, Maintenance and Inspection

Scaffolds shall be constructed and erected in accordance with the manufacturer's instructions or designed by a competent person. Scaffolding shall be erected, maintained and inspected by a properly trained scaffolding competent person. Since the types of scaffolds at remote sites will vary, the following are general guidelines for tubular and welded frame scaffolds:

- All scaffolding must be rated as "Heavy Duty" and must have a minimum design strength of 100 psf. System scaffolding is the preferred type of scaffolding for the project.
- The pipe structure, including guardrails, will be bolted, pinned or clamped at every joint.
- Mud sills (at least 2" thick X 10" wide X 12" long lumber) shall be attached at each corner to base plates and are to be used on all verticals or bearing supports. Adjusting screws rather than blocking will be used to adjust to uneven grade conditions. NOTE: adjusting screws shall never be extended more than 12" from the base plate.
- Plumb and level all scaffolds as erection proceeds, so that braces fit without forcing.
- Scaffold components manufactured by different manufacturers shall not be modified in order to inter-mix them unless a competent person determines the resulting scaffold is structurally sound.

- All scaffold decks more than four (4) feet in height must be equipped with OSHA-compliant top guardrails (38 to 45” high), mid-rails and toe boards. Fall restraint systems may be used where full-height guardrails would interfere with normal operation, however, every effort should be made to equip all sides of scaffold decks with full guardrail systems.
- On wall scaffolding place and maintain anchors between the structure and scaffold every fifteen (15) feet of length and twenty (20) feet of height.
- No tower is to be erected within fifteen (15) feet of a power line less than 50 kV. Add 4 inches for each 1 kV over 50 kV.
- All towers of ten (10) feet or more in height will be provided with interior stairways with landings and handrails or as an alternative, with an exterior stairway built as an integral part of the tower. Stairways will have handrails on both sides of the stairway consisting of top-rails, mid-rails, and landings.
- Towers less than ten (10) feet in height, if not provided with interior stairways, will be provided with either an exterior stairway or fixed ladder securely affixed to the structure and secured at ground level. The fixed ladder shall have flat rungs and will extend a minimum of 42 inches above the platform-working surface.
- All scaffold towers will be braced with stiff legs at each vertical member on each side of the tower. In addition, towers of twenty (20) feet or more in height (and/or towers erected on slopes) shall be anchored with appropriate guy wires/straps at each corner. These cables/straps shall be checked regularly (at least once at the beginning of each work day and after significant wind, rain or any other event which could conceivably cause loosening of the anchors).
- Stiff legs and guy wires/straps shall not extend into areas subject to vehicular traffic and shall be protected by fencing, barricades or other acceptable means at ground level. In addition, guy wires/straps shall be marked with highly visible flags or caution tape at three (3) feet and six (6) feet above ground level.
- All scaffold towers of twenty five (25) feet or more in height and all scaffold towers wrapped in scrim, banners or any other facing which impacts wind loading shall be designed by a Professional Engineer (PE). Design specifications shall be maintained on site at all times. Scaffold platforms must be designed to resist a wind load of at least 70 mph.
- Scaffolds and their components shall be capable of supporting, without failure, at least four (4) times the maximum intended load.

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- Roofs will be constructed to protect the crew and equipment from weather conditions if deemed appropriate by the specific supervisor. Canvas awnings will be equipped with a "break away" in the event of severe wind. Contractors will be instructed to consider maximum wind lift when installing a roof.
- Scaffolds must be inspected at the beginning of each workday by a competent person and documented on an appropriate scaffolding inspection form. Daily inspection report form shall be submitted to the SH&E representative. All identified deficiencies shall be corrected prior to scaffold usage.
- Completed scaffolding safety checklist forms should be maintained by management and submitted to the BSCM SH&E office at the end of the day.

4.3. Aerial Lift Safety Policy

4.3.1. Operating Guidelines:

The following Operating Guidelines for use of aerial lifts must be followed during all work hours.

4.3.2. Management Responsibilities:

SH&E Manager is primarily responsible for ensuring that aerial lifts used at sites are used in compliance with these guidelines and applicable OSHA requirements.

4.3.3. Aerial Lifts – General Requirements:

All aerial devices utilized personnel shall be designed, manufactured, and operated in accordance with one of the following ANSI Standards:

- A92.2 – 1900 Vehicle Mounted Elevating and Rotating Aerial Devices
- A92.5 – 1992 Boom-Supported Elevating Work Platforms
- A92.6 – 1900 Self – Propelled Elevating Work Platforms

Manufacturers of aerial devices are required by ANSI standard to publish a manual for the equipment that contains the following information:

- Description, specification, and capacity of the aerial device
- Instructions for installing or mounting the aerial device

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- An expression of the operating pressure of any hydraulic or pneumatic system that is part of the aerial device
- Instructions regarding operation and maintenance
- Replacement part information

These equipment manuals shall be obtained by the supervisor when the lift is delivered to the site and a copy shall be kept with the equipment at all times. The supervisor shall ensure that copies of the manual are readily available in the field.

The manufacturer is also required to attach to each aerial device a plate(s) located in a readily accessible area, clearly visible, stating the following:

- Make, model, and manufacturer's serial number
- Rated capacity
- Platform height
- Maximum recommended operating pressures of hydraulic or pneumatic system(s) or both
- Cautions or restrictions
- Operating instructions

Where alternative configurations are possible, the plate must show by chart the capacities of all combinations in their operating positions and cautions or restrictions for operation of all alternate configurations. The supervisor shall ensure that these plates are present on each piece of equipment. Plates shall not be removed from the device, painted over, or otherwise made unavailable for reference by the operator.

Aerial lifts may not be field modified for uses other than those intended by the manufacturer without prior approval from the BSCM SH&E Department. Any proposed alteration must be submitted in writing to the BSCM SH&E Department for approval. All other uses shall be in a manner consistent with the manufacturer's manual and this program.

4.3.4. Safety Briefing:

Only those employees and contractors who have received a safety briefing in the use of a specific type of aerial lift may use that lift. These safety briefings must be conducted in the local area by a properly qualified/competent person or an approved vendor. At a minimum, safety briefings shall include the following:

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- Review of OSHA's Vehicle Mounted Elevating and Rotating Work Platforms Regulation, 29 CFR 1910.67
- Hazards of equipment operation
- General safety principles and review of equipment safety features
- Specific equipment use procedures

All employees and contractors whose role requires operation of an aerial lift shall receive job and/or area-specific fall protection training.

No employee or contractor shall work in an area where a fall hazard is present or may occur until he/she has completed a fall protection safety briefing.

When equipment modifications are made employees and contractors shall receive additional safety briefings. The SH&E Manager shall ensure that only those employees and contractors who have participated in an appropriate safety briefing, can operate aerial lifts. If aerial lifts are rented or leased, they should be rented or leased with the stipulation that on site instruction be provided for employees and contractors on safe lift operations.

In the event that an aerial lift supply company provides the equipment operator, that company shall assure BSCM that their employees have been trained on the use of that specific equipment. Certificates of insurance should be obtained as part of the rental lease agreement.

4.3.5. Safe Operating Procedures:

General operating procedures for aerial lifts are summarized below. Employees and contractors shall always follow the specific procedures identified by the manufacturer in the equipment manual.

- Aerial lifts operated in close proximity to electrical lines must maintain a clearance between the lines and any part of the lift of at least:
  - 15 feet for power lines rated at 50kV or less
  - 15 feet plus 4 inches for every 10kV in excess of 50kV [Need to calculate this for Rio Mesa Solar for the transmission corridor]
- All power lines must be considered live until the owner of the lines or an authorized designee ensures that the lines are de-energized. The insulated portion of an aerial life may not be altered in any manner that would reduce its insulating value.

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- Whenever work is to be performed from elevated platforms in the vicinity of communication and radar equipment, prior clearance must be obtained from the installation's safety office.
- Employees and contractors shall be alert at all times and follow the procedures identified in this program. Employees and contractors using medications that may result in drowsiness or dizziness shall not use aerial lifts.
- The work zone of an aerial lift shall be cordoned off to prevent injury to bystanders.
- Tying off or securing to an adjacent pole structure or equipment while working from an aerial lift is prohibited.
- Boom and basket load limits specified by the manufacturer must not be exceeded. An aerial lift truck must not be moved when the boom is elevated in a working position with personnel in the basket except for equipment which is specifically designed for this type of operation, such as sideline vehicles.
- When outriggers are used, they must be positioned on pads or a solid surface and the brakes shall be set. Wheel chocks shall be installed before using an aerial lift on an incline.
- Articulating boom and extensible boom platforms, primarily designed as personnel carriers, must have both platform upper and lower controls. Upper controls must be in or beside the platform within easy reach of the operator. Lower controls must provide for overriding the upper controls. Controls shall be plainly marked as to their function. Lower level controls shall not be used unless permission has been obtained from the employee or contractor in the lift, except in emergency situations. Aerial lifts shall not be used during electrical storms, snow or other adverse weather conditions that could endanger employees or contractors on the platform.
- The provisions of ANSI 92.2 Section 4.9, Bursting Safety Factor, will apply to all critical hydraulic and pneumatic components. Crucial components are those in which a failure would result in a free fall or free rotation of the boom. All non-critical components must have a bursting safety factor of at least two.
- Aerial Lift Guying – Additional Safety Requirements: Aerial lifts may be stabilized with guy wires to prevent sway. The supervisor shall communicate these requirements to the operator.
- The following precautions must be taken to prevent inadvertent activation of the controls when an aerial lift is stabilized with guy wires:
- The lift should be guyed in all directions.

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- Guy wires must be tagged at heights of 3 feet and 6 feet from the ground with high visibility ribbon or tape.
- Once the lift is in the desired position and guyed, either the key or the emergency shut-off shall be engaged at the base controls.
- A tag must be placed on the operating controls at the base stating “DANGER - Lift is guyed, operation of the controls will cause tipping.”
- The employee or contractor on the platform shall remain in visual and audible contact with personnel with access to the base.

NOTE: UNDER NO CIRCUMSTANCES SHOULD GUY WIRES BE USED AS STABILIZERS WHEN THE GROUND IS UNSTABLE OR WIND SPEEDS EXCEED 30 MPH

- Immediately following the use of the set-up, the following precautions must be taken:
- The guy wires shall be removed when not in use by a person on the ground and stowed to prevent an entanglement hazard with the mechanics of the lift.
- The person on the ground shall remove the Danger Tag, insert the key or inactivate the emergency shut-off.
- The lift shall then be lowered by the person operating the base controls.
- Fall Protection: A safety harness must be worn and a lanyard attached to a suitable anchorage point on the boom or basket when working from single knuckle lifts.
- Transporting Aerial Lifts: Manufacturer instructions shall be followed before transporting aerial lifts. Aerial ladders must be secured in the lower traveling position by the locking device on top of the truck cab and the manually operated device at the base of the ladder before the truck is moved for highway travel. The supervisor shall ensure that each boom is properly cradled, that outriggers are in stowed positions, and other manufacturer requirements have been met before moving.
- On-loading and off-loading aerial lifts shall be done using appropriate handling equipment and practices.
- Aerial Lift Inspections: The lift operator shall inspect and test lift controls and equipment each day prior to operation to ensure that the controls are in safe working condition. Aerial lifts must be inspected at the beginning of each workday.
- However, if provided in the equipment manual, use the manufacturer’s safety checklist.

- Report any unsafe conditions to the supervisor and immediately and remove the equipment from service until repairs can be made.
- The supervisor shall review and sign the daily inspection checklist and ensure that equipment that is not operating properly is taken out of service and repaired.
- Completed Operations Safety Aerial Lift Daily Inspection Checklist forms should be maintained by field supervision..
- Manufacturer's recommended maintenance procedures must be strictly followed. All repairs must be done by qualified personnel.

4.3.6. Definitions: As referenced in this section.

Definitions	
Aerial Device	Any vehicle mounted device, telescoping or articulating or both, which is used to position personnel.
Aerial Ladder	An aerial device consisting of a single or multiple section extensible ladders.
Articulating Boom Platform	An aerial device with two or more hinged boom sections.
Extensible Boom Platform	An aerial device (except ladders) with a telescopic or extensible boom. Telescopic derricks with personnel platform attachments shall be considered to be extensible boom platforms when used with a personnel platform.
Insulated Aerial Device	An aerial designed for work on energized lines and apparatus.
Mobile Unit	A combination of an aerial device, its vehicle, and related equipment.
Platform	Any personnel-carrying device (basket or bucket), which is a component of an aerial device.
Vehicle	Any carrier that is not manually propelled.
Vertical Tower	An aerial device designed to elevate a platform in substantially vertical axis.

4.4. Forklift Truck Safety Policy

4.4.1. Operating Guidelines

The following Operating Guidelines for use of forklift trucks must be followed during all work hours.

4.4.2. Management Responsibilities

The SH&E Manager is responsible for the use at work sites and that they are used in compliance with these guidelines and applicable OSHA requirements.

4.4.3. Forklift Trucks – General Requirements:

Forklift trucks (also referred to as "Powered Industrial Trucks") may be provided at remote sites for purposes of material handling during load-in and/or load-out.

- All forklift trucks utilized by personnel shall meet the design and construction requirements for powered industrial trucks in accordance with ANSI B56.1-1969 - Standard for Powered Industrial Trucks, Part II. Should be referenced as standard at beginning of document
- Manufacturers of forklift trucks are required by ANSI standard to publish a manual for the equipment that contains the following information:
  - Description, specification, and capacity of the forklift truck
  - An expression of the operating pressure of any hydraulic or pneumatic system that is part of the forklift truck
  - Instructions regarding operation and maintenance
  - Replacement part information
- These manuals shall be obtained by the supervisor when the lift is delivered to the site and a copy shall be kept with the equipment at all times. The supervisor shall ensure that copies of the manual are readily available in the field.
- The manufacturer is also required to attach to each forklift truck a plate(s) located in a readily accessible area, clearly visible, stating the following:
  - Make, model, and manufacturer's serial number
  - Rated capacity
  - Maximum recommended operating pressures of hydraulic or pneumatic system(s) or both
  - Cautions or restrictions
  - Operating instructions
- Forklift trucks may not be field modified for uses other than those intended by the manufacturer without prior approval from the BSCM SH&E department. Any proposed

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alteration must be submitted in writing to the BSCM SH&E Department for approval. All other uses shall be in a manner consistent with the manufacturer's manual and this program.

4.4.4. Safety Briefing:

Only those employees and contractors who have participated in a safety briefing in the use of a specific type of forklift truck may use that equipment. These safety briefings must be conducted in the local area by a qualified/competent individual.

- At a minimum, a safety briefing shall include the following:
  - Review of OSHA's Powered Industrial Truck Standard, 29 CFR 1910.178
  - Hazards of equipment operation
  - General safety principles and review of equipment safety features
  - Specific equipment use procedures
- Supervisors shall ensure that only qualified employees and contractors who have participated in an appropriate safety briefing, are allowed to operate forklift trucks. If forklift trucks are rented or leased, they should be rented or leased with the stipulation that on site instruction be provided for employee and contractor personnel on safe operations.
- In the event that a forklift truck supply company provides the equipment operator, that company shall assure BSCM that their employees have been trained on the use of that specific equipment and are qualified to operate it. Certificates of insurance should be obtained as part of the rental lease agreement.

4.4.5. Pre-Use Inspection

The operator of an industrial truck (or other qualified person) is required to perform an inspection of the equipment prior each day's use. Any defects that would affect safe operation of the equipment must be repaired before use. The most efficient way of checking the machine is by conducting a walk-around inspection. The five areas of inspection include engine compartment: wheels, rims and tires; forks, uprights and attachments; operator controls; and fuel system. Visual inspection should be performed only when hydraulic systems are in a relaxed state, with the engine off, forks fully lowered and parking brake set. The following items should be checked during the pre-use inspection:

- Fluid Levels: oil, coolant, battery, hydraulic fluid, brakes, transmission fluid

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- Drive Belts: condition and proper tension
- Wheel Rims: dents, lug nuts
- Mast and Carriage: condition, bolts, welds
- Chain Guides, Pulleys, Channels, Rollers: wear, freedom of motion
- Chain: Flexibility, wear, lubrication
- Lift Cylinder: alignment, damage, leaks, nicks/pits in cylinder rods
- Hoses: wear, leakage, binding
- Control Valves/Blocks: leakage, damage
- Attachments: condition, welds, hardware
- Overhead Guard: damage, secure mounting
- Forks: cracks, secure mounting, alignment, wear bends
- Instrument Gauges: function
- Warning Devices: horn, lights
- Steering: function
- Lift Controls: function of lift, tilt, auxiliary controls
- Hydraulic Controls: function
- Brakes: function, pedal pressure
- Fuel Tank (LPG): condition, leakage, fittings, clamps
- Equipment Storage Area: spillage/leakage on floor
- Equipment Surfaces: grease, foreign material
- Fire Extinguisher: mounted on any truck used outdoors

4.4.6. Safe Operating Procedures – General

General operating procedures for forklift trucks are summarized below. Employees and contractors shall always follow the specific procedures identified by the manufacturer in the equipment manual as well as the following items:

> **CAUTION: Forklift trucks are never to be used for lifting personnel**

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- Perform the pre-use daily inspection. Any deficiencies which may affect safe operation must be repaired prior to use.
- Be knowledgeable of the weight limitation of the truck (see capacity plate mounted on the machine.
- Plan ahead and determine your intended route of travel.
- Avoid operating in congested areas where clearance between truck and material or pedestrians is questionable.
- Check to ensure that all persons are a safe distance (two feet or more) from the truck.
- Prior to entering a trailer, truck, or rail car, check to ensure for: numbering again
- Proper placement of wheel blocks or engagement of truck/dock locking device. (This applies even when the tractor is engaged to semi trailer).
- Proper position and condition of dock board.
- Safe condition of vehicle floor surface.
- Prior to entering a semi trailer less than 30 feet in length, when not coupled to a tractor, provide supplementary jacking at the front of the trailer to sustain the load imposed by the industrial truck.
- Be aware of conditions around you. Drive defensively and “expect the unexpected”.
- The only passenger on a powered industrial truck shall be the operator, and only if the truck is designed for a riding operator.
- The driver must always keep entire body inside the operator compartment while operating the truck.
- Speed up and slow down the truck smoothly and gradually. Avoid jerky, abrupt movements.
- Always give the right-of-way to any pedestrian walking in your path of travel, and never drive up to a person who is standing in front of a fixed object.
- Observe the floor for wet or slippery areas and clean as necessary. Avoid running the truck over loose objects on the floor surface.
- Attempt to turn the truck only while on a level surface.

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- When approaching a corner or other obstruction which blocks your field of vision, STOP, ACTIVATE HORN, and then proceed slowly with caution. If necessary, travel in reverse if this will enhance your field of vision.
- Always come to a complete stop at designated intersections.
- Maintain slow but constant speed while moving around corners (avoid acceleration and deceleration).Watch your rear-end swing while turning the truck.
- Never travel sideways across an inclined surface. Always travel in a straight line either up or down the incline.
- When traveling up on an incline without a load, keep truck forks pointed uphill.
- When traveling up on an incline with a load, keep truck forks pointed uphill.
- If necessary to leave a truck parked on an incline, block the truck wheels and turn the steering wheel toward the curbing, wall, or railing.
- Maintain clearance of at least three feet while driving parallel to the edge of an elevated platform such as a loading dock.
- Approach railroad tracks at an angle.
- Prior to leaving a truck unattended:
  - Park only in approved area
  - Engage the brakes
  - Lower the forks to the floor
  - Neutralize controls
  - Ignition off; remove key
- Operators shall not make any repairs or adjustments unless specifically authorized to do so.
- Horseplay may result in immediate revocation of the Operator Certificate and application of other disciplinary action, not excluding termination.
- Safe Load Handling:
  - Inspect the load before handling. Handle only stable loads in good condition.
  - Never exceed the manufacturer's load rating of an industrial truck. If uncertain of the load weight, lift the load very slowly. If the truck begins to tip, or if the engine is straining, do not proceed with the lift.

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- ◊ Never overload a truck, as this will cause a loss of steering control and stability.
- ◊ Never add weight to the counter-balance to compensate for overloading of forks.
- ◊ Always turn the truck steering wheel gradually to prevent loss of control.
- ◊ When engaging a load, the truck forks must be inserted fully under the load.
- ◊ Adjust the forks to be as wide apart as possible for the load. This will increase load stability.
- ◊ Always observe the work area for overhead obstructions before lifting a load.
- ◊ A backrest must be used if loads are to be lifted above truck operator head level.
- ◊ Inspect the load to ensure that is not unstable, and that the pallet is not damaged.
- ◊ When lifting, lowering and transporting a load, keep the load as close to the front wheels as possible.
- ◊ Enter vehicles, trailers, and rail road cars "load-first", to avoid crushing the operator between the truck and vehicle wall.
- ◊ To elevate a load:
- ◊ First make sure the truck is fully stopped with the brake applied.
- ◊ If uncertain of load weight, test the load slowly before proceeding.
- ◊ Position load straight up or tilted back, but never tilted forward.
- ◊ Only lift loads that are at or below fork backrest height.
- ◊ Check to ensure that the load will not catch on other materials or obstruction.
- ◊ To move a load: numbering again
- ◊ Fork height should be 6 to 10 inches above floor level. Never travel with loaded elevated above 10 inches.
- ◊ Do not proceed if your vision is blocked by the load. If the load obstructs your frontal view, travel in reverse should be considered.
- ◊ Drive slowly.
- ◊ Stop or slow the truck gradually. Avoid quick stops or quick changes in direction of travel, which could result in dumping the load.
- ◊ The presence of a person beneath an elevated load is prohibited.
- ◊ Be sure that truck forks are free of the load before backing away from the load.

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- ◊ Do not store a load where it will block access to electrical panels, emergency fire equipment, or building exit route.

4.4.7. Refueling and Recharging

Refueling may only be accomplished by a certified operator/technician.

The above information is "generic" to most powered industrial trucks. Some models may have specific safety requirements in addition to that provided above.

The operator/owner manual should be reviewed prior to operating any powered industrial truck and a safety briefing on the specific type(s) of machine(s) to be operated is also required.

4.5. Crane Safety Policy

4.5.1. Operating Guidelines

The following Operating Guidelines for use of cranes must be followed during all work.

4.5.2. Management Responsibilities

The SH&E Manager is primarily responsible for ensuring that cranes used at sites are used in compliance with these guidelines and applicable OSHA requirements.

4.5.3. Cranes – General Requirements

- ♦ Crane Vendors:
  - ◊ The crane contractor will provide certificates of insurance prior to signing of contracts.
  - ◊ The crane company shall document that the crane has been inspected immediately before our use and that it meets the requirements prescribed in ANSI B30.5 and OSHA 1926.550 (b)(2). Another reference for the front
- ♦ Operational Check:
  - ◊ The unoccupied platform is to be raised to its operating height and rotated to its working position daily before it is mounted by any employee or contractor. The trial lift is to be repeated prior to hoisting employees or contractors whenever the crane is moved and set up in a new location or returned to the previous location.

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- ◊ The crane operator will remain in the cab at all times when the platform is aloft.
- ◊ The crane contractor is to provide professional riggers and flyers.
- ◊ Any defects found during inspections which create a safety hazard shall be corrected before hoisting equipment or personnel.

♦ Crane Platforms

- ◊ The use of crane jibs for suspended platforms is prohibited.

4.6. Electrical Safety Policy

4.6.1. Operating Guidelines

The following Operating Guidelines for electrical safety must be followed during all work.

4.6.2. Management Responsibilities:

The Project Director and SH&E Manager are primarily responsible for ensuring that these electrical safety guidelines are implemented at work sites.

4.6.3. Electrical Safety – General Requirements

Electrical safety procedures to protect the safety of the employees and will be an essential consideration when conducting remote operations. Electrical accidents are caused by a combination of three possible factors -unsafe equipment and/or installation, workplaces made unsafe by the environment, and unsafe work practices during installation, alteration, troubleshooting, and repair of electrical equipment. Working with this equipment requires skilled and knowledgeable personnel who can perform the work in a safe manner. The following electrical safety requirements should be followed:

♦ Lighting: Lamps for general illumination must be protected from breakage and metal shell sockets must be grounded. Temporary lights must not be suspended by the cords, unless they are designed for such use.

♦ Installations: Electrical installations made in accordance with the current National Electrical Code another code reference for the front section are considered to be in compliance with OSHA's electrical standard for construction, except for the following requirements:

- ◊ Employers must provide either ground-fault circuit interrupters (GFCI's) or an assured equipment grounding conductor program to protect employees, and

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contractors from ground fault hazards at construction (remote) sites. These two options are detailed below.

◊ All 120 volt, single-phase, 15-and 20-ampere receptacles that are not part of the permanent wiring must be protected by GFCI's. Receptacles on smaller generators are exempt under certain conditions.

OR

◊ An assured equipment grounding program covering extension cords, receptacles, and cord-and-plug-connected equipment must be implemented. The program must include the following:

- A written description of the program
- At least one competent person to implement the program
- Daily visual inspections of extension cords and cord-and-plug-connected equipment for defects
- Continuity tests of the equipment grounding conductors or receptacles, extension cords, and cord-and-plug-connected equipment.

4.6.4. Electrical Work Practices

Management personnel must not allow employees or contractors to work near live parts of electrical circuits, unless employees and contractors are protected by one of the following means:

- Energizing and grounding the parts.
- Guarding the parts by insulation.
- Any other effective means.

In work areas where the exact location of underground electrical power lines is unknown, employees and contractors using tools that may contact the lines must be protected by insulating gloves, aprons, or other protective clothing which will provide equivalent electrical protection.

Barriers or other means of guarding must be used to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of equipment are exposed.

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4.6.5. Electrical Safety for Remote Vehicles and Operations

The following electrical safety procedures should be implemented at all remote operations worksites:

- Inspect all trailer mounted / truck mounted equipment at the start of an assignment, to insure no damage has occurred during transit. Damage shall be reported to the responsible supervisor.
- Hydrogen gas is explosive and produced when batteries are charging. Avoid open flames, sparks, and smoking in these areas.
- Visually inspect all A.C. cables prior to making any electrical connection.
- Inspect all plug type connectors for broken or damaged plugs and for loose or frayed cable connections.
- Identify any plug, cable or connector found by removing the item from service and marking with a red defective.
- All power cables must be color coded. If cables of the appropriate color are unavailable, the plug connector housing will be covered on each end with tape of the appropriate color:
  - ◊ All ground cable will be identified by the color GREEN.
  - ◊ All neutral cable will be identified by the color WHITE.
  - ◊ All live source cable will be identified by a color other than above.
- A non-standard plug configuration shall be used on all ground cable.
- All ground cables shall be connected first, and shall be the last cable to be disconnected. The ground cable shall never be disconnected while power is being provided to the trailer/truck mounted equipment. The ground shall never be disconnected to resolve technical problems such as an interfering “hum”.
- All A.C. cables shall be protected from damage and be properly coiled.
- All ground cable associated with a specific piece of equipment shall have a permanent tag placed on both ends of the cable to identify what piece of equipment it is grounding.
- All cables shall be bundled neatly and protected from damage where high traffic conditions exist. DO NOT bundle AC power cables with audio/video cables.
- Electrical cables shall be placed in high visibility cable troughs for protection in areas of pedestrian and/or vehicular traffic or where they pose a tripping hazard.

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- Employees and contractors shall use ground fault circuit interrupter (GFCI) equipment when temporary electrical wiring or outside/wet locations utilizing electricity are required.
- Employees and contractors shall use an assured equipment grounding program where GFCIs cannot be used on technical equipment due to stray RF fields that inadvertently trip the GFCIs.

4.6.6. Procedures for Energizing Field Equipment:

The engineer-in-charge shall place all A.C. safety switches associated with trailer mounted/truck mounted equipment into the OFF position before any electrical connections are made.

Where remote site electricians connect the A.C. supply cables, the supply cables will remain de-energized until such time as the engineer-in-charge visually inspects all conductors and deems it safe to authorize power up.

The operator in charge shall perform a mandatory overhead clearance inspection prior to energizing equipment and attempting to raise any aerial device.

4.6.7. Extension Cords/Multiple Outlet Boxes/Flexible Cords and Cables:

- Use only three-wire, 12 or 14 GA, extension cords and cables.
- Check extension cords before use to ensure they are adequate for the intended current and purpose.
- DO NOT use multiple extension cords connected together.
- Inspect extension cords daily for damage before placing them in service.
- Receptacles connected to circuits with different voltages, frequencies, or current (ac or dc) shall have different attachment configurations.
- Only high-visibility orange or yellow extension cords rated for hard or extra hard use shall be used outdoors.
- Flexible cords and cables shall comply with the requirements in NEC Article 400 (Flexible Cords and Cables). They shall not be used as a substitute for fixed wiring of a structure.
- Flexible cords and cables shall not be:

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- Routed through holes in walls, ceiling, or floors: or through doorways, windows, or similar openings (unless appropriately guarded to prevent damage), concealed behind building walls, ceilings, or floors.
- Wired with plug or connector that has live parts exposed to a person on the operations side of the equipment.
- Placed where they could present a trip or fall hazard.
- Used when the cord insulation is damaged, cracked, or spliced; or when the grounding pin is missing from the end of the male cord plug.
- Installed in raceways, except as otherwise permitted by the event organizer/host.

4.6.8. Activities:

- A switching procedure is required for all high voltage system operations (greater than 400 volts) or for lower voltages where there is a possibility of back feed to the high voltage system under consideration. If these conditions are encountered, a LICENSED ELECTRICIAN should be contracted to perform the necessary work. A licensed electrician shall be used for all switching regardless of the voltage
- ONLY LICENSED ELECTRICIANS shall be permitted to work on exposed live current carrying conductors.

4.6.9. Assured Equipment Grounding Conductor Program

SH&E Manager shall ensure all cord sets, receptacles which are not a part of the building or mobile unit, and equipment connected by cord and plug which are available for use or used by employees and contractors are inspected at the frequency required by this program as set forth below.

Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective shall be tagged and immediately taken out of service until repaired.

The following tests shall be performed on all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and cord-and plug-connected equipment required to be grounded:

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- All equipment grounding conductors shall be tested for continuity.
- Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.
- All required tests shall be performed:
  - Before first use;
  - Before equipment is returned to service following any repairs;
  - Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example, when a cord set is run over); and,
  - At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months.
- All receptacles, cord sets, and cord-and plug-connected equipment that satisfactorily pass the visual inspection and continuity test shall be marked with a tag with date of inspection/test.

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5. INCLEMENT WEATHER

5.1. Operating Guidelines

The following Operating Guidelines for inclement weather safety must be followed during all work hours.

5.2. Management Responsibilities

Project Director and SH&E Manager are primarily responsible for ensuring that these inclement weather safety guidelines are implemented.

5.3. Inclement Weather – General Requirements

It is the responsibility of the Project Director and SH&E Manager to ensure appropriate actions are taken in the event of severe weather.

Up to date information on weather-related emergencies can be obtained through the National Oceanic and Atmospheric Administration (NOAA) Weather Radio network. The NWR has more than 480 transmitters, covering the 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific Territories. NWR requires a special radio receiver or scanner capable of picking up the signal. Broadcasts are found in the public service band at these seven frequencies (MHz): 162.400, 162.425, 162.450, 162.475, 162.500, 162.525, and 162.550.

5.4. Thunderstorms and Lightning

Thunderstorms can bring heavy rains (which can cause flash flooding), strong winds, hail, lightning and tornadoes. Lightning is a major threat during a thunderstorm. In the United States, between 75 to 100 people are hit and killed each year by lightning. If you are caught outdoors, avoid natural lightning rods such as tall, isolated trees in an open area or the top of a hill and metal objects such as wire fences, golf clubs and metal tools. It is a myth that lightning never strikes twice in the same place. In fact, lightning will strike several times in the same place in the course of one discharge.I didn't know that.

Thunderstorms and lightning can be found throughout the United States.

Lightning is an electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears

as a "bolt." This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning reaches a temperature approaching 50,000 degrees Fahrenheit in a split second. The rapid heating and cooling of air near the lightning causes thunder.

5.4.1. Thunderstorm Watches & Warnings:

A Severe Thunderstorm Watch is issued by the National Weather Service when the weather conditions are such that a severe thunderstorm (damaging winds 58 miles per hour or more, or hail three-fourths of an inch in diameter or greater) is likely to develop. This is the time to watch the sky and listen to the radio or television for more information.

A Severe Thunderstorm Warning is issued when a severe thunderstorm has been sighted or indicated by weather radar. At this point, the danger is very serious and outdoor work should be suspended. Wait for the "all clear" by the authorities.

5.4.2. Lightning Danger Signs

Some thunderstorms can be seen approaching, while others hit without warning. It is important to learn and recognize the danger signs and to plan ahead. Learn the thunderstorm danger signs:

- Dark, towering, or threatening clouds
- Distant lightning and thunder

5.4.3. Thunderstorm Actions:

- Check the area for hazards. Dead or rotting trees and branches can fall during a severe thunderstorm and cause injury and damage.
- Secure outdoor objects that could blow away or cause damage or injury. Take light objects inside. Close windows securely and brace outside doors. Listen to a battery operated radio or television for the latest storm information. Do not handle any electrical equipment or telephones because lightning could follow the wire.
- If outdoors, attempt to get into a building, car, or mobile unit. If no structure is available, get to an open space and squat low to the ground as quickly as possible. If in the woods, find an area protected by low clump of trees--never stand underneath a single large tree in the open. Be aware of the potential for flooding in low-lying areas. Crouch with hands on knees. Avoid tall structures such as towers, tall trees, fences, telephone lines, or power

lines. Stay away from natural lightning rods such as golf clubs, tractors, fishing rods, bicycles, or camping equipment. Stay from rivers, lakes, or other bodies of water. If you are isolated in a level field or prairie and you feel your hair stand on end (which indicates that lightning is about to strike), bend forward, putting your hands on your knees. A position with feet together and crouching while removing all metal objects is recommended. Do not lie flat on the ground.

- Because light travels much faster than sound, lightning flashes can be seen long before the resulting thunder is heard. Estimate the number of miles you are from a thunderstorm by counting the number of seconds between a flash of lightning and the next clap of thunder. Divide this number by five. You are in danger from lightning if you can hear thunder. Take immediate action to seek shelter when lightning is determined to be six (6) miles away. Knowing how far away a storm is does not mean that you're in danger only when the storm is overhead.

5.4.4. Following a Thunderstorm:

A person who has been struck by lightning does not carry an electrical charge that can shock other people. If the victim is burned, provide first aid and call emergency medical assistance immediately. Look for burns where lightning entered and exited the body. If the strike causes the victim's heart and breathing to stop, give cardiopulmonary resuscitation (CPR) until medical professionals arrive and take over.

5.5. Flash Floods

5.5.1. Flash Flood Danger Signs

Floods and flash floods occur within all 50 states. Communities particularly at risk are those located in low-lying areas, near water, or downstream from a dam. Floods are the most common and widespread of all natural disasters--except fire. Most communities in the United States can experience some kind of flooding after spring rains, heavy thunderstorms, or winter snow thaws. Floods can be slow- or fast-rising but generally develop over a period of days.

Flash floods usually result from intense storms dropping large amounts of rain within a brief period. Flash floods occur with little or no warning and can reach full peak in only a few minutes. Flood waters can be extremely dangerous. The force of six inches of swiftly moving water can knock people off their feet. The best protection during a flood is to leave the area and go to shelter on higher ground. Flash flood waters move at very fast speeds and

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can roll boulders, tear out trees, destroy buildings, and obliterate bridges. Walls of water can reach heights of 10 to 20 feet and generally are accompanied by a deadly cargo of debris.

5.5.2. Flash Flood Actions

The best response to any signs of flash flooding is to move immediately and quickly to higher ground. Cars can be easily swept away in just 2 feet of moving water. If flood waters rise around a car, it should be abandoned. Passengers should climb to higher ground.

Avoid walking through any floodwaters. If it is moving swiftly, even water only 6 inches deep can sweep you off your feet. If advised to evacuate, do so immediately. Evacuation is much simpler and safer before flood waters become too deep for ordinary vehicles to drive through.

5.5.3. Following a Flash Flood

Flood dangers do not end when the water begins to recede. Listen to a radio or television and don't return to the site until authorities indicate it is safe to do so.

> NOTE: Stay out of buildings if flood waters remain around the building.

5.6. Severe Weather - Cold Environments

Prolonged exposure to cold air can lead to dangerous hypothermia. Adequate insulating clothing is necessary whenever work is performed in air temperatures below 40° F. Wind increases the body's rate of heat loss; therefore, the wind chill factor must also be taken in to account when evaluating exposure to cold environments.

Cold injury, i.e. frostbite, is unlikely to occur to extremities without developing the initial signs of hypothermia. Pain in the extremities, severe shivering, fatigue, drowsiness, irritability, or euphoria are signs of dangerous exposures and immediate action must be taken to remove the employees and contractors from the elements.

5.6.1. Severe Weather – Cold Environment Actions:

- Employees and contractors whose clothing becomes wet at air temperatures of 35.6° F must be provided dry clothing immediately to prevent hypothermia.
- If air temperatures are below 0° F, hands shall be protected by mittens.

- At temperatures below 10.4° F, the following applies:
- Employees and contractors shall be under constant supervision or use the buddy system.
- The work rate should not induce sweating.
- Unprotected metal seats should not be used.
- Employees and contractors shall be protected from winds to the extent possible.
- Employees and contractors shall be informed of the signs of frostbite and encouraged to report signs immediately.
- Warm sweet drinks and soup should be provided during breaks to increase fluid volume/caloric intake.
- Drinking coffee should be discouraged because of the diuretic effect.
- Continuous exposures should not be permitted when the effective temperature (wind chill and air temperature) is below -26°.

5.6.2. Severe Weather - Hot Environments

Four (4) environmental factors affect the amount of stress a worker faces in a hot work area: temperature, humidity, radiant heat (such as from the sun or a furnace) and air velocity. Perhaps most important to the level of stress an individual faces are personal characteristics such as age, weight, fitness, medical condition and acclimatization to the heat.

The body reacts to high external temperature by circulating blood to the skin which increases skin temperature and allows the body to give off its excess heat through the skin. However, if the muscles are being used for physical labor, less blood is available to flow to the skin and release the heat.

Sweating is another means the body uses to maintain a stable internal body temperature in the face of heat. However, sweating is effective only if the humidity level is low enough to permit evaporation and if the fluids and salts lost are adequately replaced.

As the body continues to store heat, the individual begins to lose concentration and has difficulty focusing on a task, may become irritable or sick and often loses the desire to drink. The next stage is most often fainting and death is possible if the person is not removed from the heat stress.

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5.6.3. Heat Disorders: The following disorders are commonly associated with heat exposure:

- Heat stroke is the most serious health problem for workers in hot environments. Sweating stops and the body can no longer rid itself of excess heat. Signs include (1) mental confusion, delirium, loss of consciousness, convulsions or coma; (2) a body temperature of 106 degrees F or higher; and (3) hot dry skin which may be red, mottled, or bluish. Victims of heat stroke will die unless treated promptly. Call 911 immediately and then the victim must be removed to a cool area and his or her clothing soaked with cool water. He or she should be fanned vigorously to increase cooling.
- Heat exhaustion results from loss of fluid through sweating when a worker has failed to drink enough fluids or take in enough salt or both. The worker with heat exhaustion still sweats but experiences extreme weakness or fatigue, giddiness, nausea, or headache. The skin is clammy and moist, the complexion pale or flushed, and the body temperature normal or slightly higher. Treatment is usually simple: the victim should rest in a cool place and drink an electrolyte solution
- Heat cramps, painful spasms of the muscles, are caused when workers drink large quantities of water but fail to replace their bodies' salt loss. Fainting (heat syncope) may be a problem for the worker unacclimatized to a hot environment who simply stands still in the heat. Victims usually recover quickly after a brief period of lying down. Moving around, rather than standing still, will usually reduce the possibility of fainting. Cramps may occur during or after working hours and may be relieved by taking liquids by mouth.
- Heat rash, also known as prickly heat, may occur in hot and humid environments where sweat is not easily removed from the surface of the skin by evaporation. . It can be prevented by resting in a cool place and allowing the skin to dry.

5.6.4. Severe Weather – Hot Environment Actions

Most heat-related health problems can be prevented or the risk of developing them reduced. Following a few basic precautions should lessen heat stress.

Engineering controls including general ventilation and spot cooling by local exhaust ventilation at points of high heat production may be helpful. Shielding is required as protection from radiant heat sources.

Work practices such as providing plenty of drinking water -- as much as a quart per worker per hour -- at the workplace can help reduce the risk of heat disorders. Employers should also consider an individual worker's physical condition when determining his or her fitness

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for working in hot environments. Older workers, obese workers and personnel on some types of medication are at greater risk. Employees, contractors and visitors should ensure that water is available when going to the field and in nearby vehicles.

Alternating work and rest periods with longer rest periods in a cool area can help workers avoid heat stress. If possible, heavy work should be scheduled during the cooler parts of the day and appropriate protective clothing provided.

Acclimatization to the heat through short exposures followed by longer periods of work in the hot environment can reduce heat stress.

Education is vital so that workers are aware of the need to replace fluids and salt lost through sweat and can recognize dehydration, exhaustion, fainting, heat cramps, salt deficiency, heat exhaustion, and heat stroke as heat disorders.

Continuous exposures should not be permitted when the combination of ambient air temperature and relative humidity exceeds 95º F and 70% respectively.

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6. HEARING CONSERVATION

6.1. Operating Guidelines

The following Operating Guidelines for hearing conservation must be followed during all work hours.

6.2. Management Responsibilities

The Project Director and the SH&E Manager are primarily responsible for ensuring that these hearing conservation guidelines are implemented.

6.3. Hearing Conservation – General Requirements

Occupational Safety Standards require BSCM to provide hearing protection, audiometric testing and a safety briefing to employees exposed to noise levels exceeding 85 dBA for 8 hours or 115 dBA for 15 minutes. The standard also mandates noise monitoring to determine noise exposure over time.

Long-term exposure to noise levels in excess of 90 dBA (averaged over an 8-hour workday) and/or short-term exposure to noise levels in excess of 115 dBA can result in permanent and irreversible hearing loss.

NOTE: Noise levels can only be measured with a properly calibrated sound level meter, however, a good "rule of thumb" is as follows: Noise levels probably exceed 90 dBA if you must raise your voice for someone to understand you during normal face-to-face conversation.

Health and Safety should be consulted whenever operations may involve long-term (> 8 hours) exposure to noise levels greater than 90 dBA or short-term (>15 minutes) exposure to noise levels greater than 115 dBA. BSMC Health and Safety will evaluate noise exposure potential and determine an appropriate course of action.

6.4. Noise Exposure Reduction

Exposure to noise levels can be controlled by minimizing the amount of time spent in the vicinity of high noise levels. However, the nature of certain remote operations requires that employees and contractors work in high noise level areas. The first line of defense is to minimize this exposure by limiting time in the area to only that time necessary to complete the work. Another consideration is the distance away from the noise source and in general

and contractors should perform their work from a location as far as possible from the noise source.

Additional protection can be provided by properly-fitted noise attenuation devices such as ear muffs and ear plugs. Noise attenuating ear muffs and headsets can effectively reduce exposure to moderate noise levels. However, during higher noise levels additional protection will be required. This can be accomplished by wearing disposable or custom-fitted earplugs underneath the ear muffs or headsets.

6.5. Audiometric Testing

Employees routinely exposed to high noise levels will receive an annual audiometric test to measure hearing ability and determine if the employee has experienced a hearing threshold shift. Audiometric testing will be coordinated by the Safety, Health and Environmental Department.

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7. FIRST AID

BSCM requires that a first aid kit be maintained in a convenient location at each work area. The on-site SH&E Manager responsible to ensure that first aid kits are:

- Placed in appropriate locations,
- Properly stocked and maintained,
- Inspected periodically, but not less than monthly.
- Available for use at any time for employees and contractors are working at the site.

> If an employee or contractor is experiencing a medical emergency, including, but not limited to, the following symptoms or conditions: unconsciousness or unresponsiveness, severe bleeding, chest pain, difficulty breathing, or seizure, immediately call 911.

Employees and contractors with occupational injuries that require any medical treatment, which prevents them from performing their normal job duties or which may be OSHA recordable, must report those injuries to their supervisor immediately.

First aid kits should not be used by anyone who is not an employee or contractor.

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8. ACCIDENT MANAGEMENT PROCEDURES

8.1. Operating Guidelines

The following Operating Guidelines for the prevention and investigation of accidents must be followed during all work hours.

8.2. Management Responsibilities

The Project Director and SH&E Manager are primarily responsible for ensuring that these accident management procedures are implemented.

8.2.1. Accident Management Procedures – General Requirements

All accidents shall be investigated as soon as possible by the injured person's immediate supervisor.

The purpose of the accident investigation and reporting is to assist the supervisor of the injured person or environmental occurrence in identifying the cause or causes of occupational injuries/illnesses and environmental occurrences and take appropriate corrective actions to prevent recurrence.

All accidents involving employees, contractors, vehicles, customers, vendors or the general public shall be investigated. The depth and complexity of the investigation will vary with the circumstances and seriousness of the accident. The Supervisor or other individual responsible for operations involved in an accident should ensure that an investigation is conducted and that when appropriate, corrective actions are taken.

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9. APPENDICES

None

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ATTACHMENT DR 59-2

DRAFT SITE SPECIFIC SAFETY PLAN

Site Specific Safety Plan

REVISIONS			
REV	**DESCRIPTION**	**BY**	**DATE**
A	Initial Draft Release	Stephen Keyes	

Note: The official document may change from time to time. When using a hardcopy, please verify that you have the most updated revision.

APPROVALS for Rev A			Restriction: Confidential & Proprietary
	Name	**Date**	**Signature**
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Doc. Control			

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BrightSource

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1. INTRODUCTION

1.1. Purpose

This Site Specific Safety Plan for Bright Source Construction Management (BSCM) site activities has been developed in accordance with Cal-OSHA Regulations and Specific Site Safety requirements. This Site Specific Safety Plan has focused on activities foreseen on the job site for the tasks identified herein. Additional activities and requirements identified in the course of the work shall be evaluated for potential safety risks and appropriate planning, training and mitigation developed in accordance with the Master Services Contract (MSC) and other documents.

1.2. Scope/Applicability

Manage the engineering, procurement and construction of the Rio Mesa Solar Electric Generating System facility.

1.3. Project Tenets and Principles

- Do it safely or not at all.
- There is always time to do it right.
- Protect The Environment.

Always:

- Operate within design or environmental limits.
- Operate in a safe and controlled condition.
- Ensure safety devices are in place and functioning.
- Follow safe work practices and procedures.
- Meet or exceed customers' requirements.
- Maintain integrity of dedicated systems.
- Comply with all applicable rules and regulations.
- Address abnormal conditions.
- Follow written procedures for high risk or unusual situations.

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- Involve the right people in decisions that affect procedures and equipment.

1.4. Responsibilities

1.4.1. Management:

- Post an up-to-date statement of the contractor's policy for Environment, Safety and Health (ES&H), and ensure that it is brought to the notice of all employees. Communicate the incident free work philosophy and commitment that set levels of expectations for safety performance.
- Ensure that all BSCM visitors receive a "Visitor Safety Orientation" and are escorted on the project.
- Maintain overall control for Environment, Safety and Health (ES&H).
- Ensure established safety policies are properly administered and enforced.
- Arrange for adequate resources (e.g. funds, facilities, and personnel) to meet the requirements of the ES&H Policy.
- Ensure that field operations are aware of and implement policy and associated processes, programs, procedures, and safe work practices established to safely control the work.
- Know the appropriate statutory requirements affecting the operations.
- Ensure that appropriate training is given to all staff prior to arriving at job site.
- Ensure that there is liaison on ES&H matters between the company and other contractors working on the site.
- Institute incident reporting and investigation process to eliminate hazards and implement appropriate corrective actions, utilizing lessons learned to avoid recurrence. Promote analysis of investigations to discover trends and weaknesses in the system of controls.
- Discipline, re-educate/train, or replace (or a combination thereof) any member of staff failing to satisfactorily discharge responsibilities for ES&H.
- Set a personal example when visiting sites by wearing appropriate PPE, and following applicable rules.
- Arrange for regular reports to be reviewed to analyze safety performance, incident statistics, losses, and training standards. Metrics tracked and analyzed in reporting should include both leading and lagging indicators.

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- Conduct periodic job site visits to validate effectiveness of ES&H Program and JSSP implementation.
- Identify trends as they develop and modify plans and procedures accordingly.

1.4.2. Supervisors/Foremen Must:

- Verify all personnel are fit for duty.
- Know and apply the Safety Policy, programs and relevant safety rules and regulations to the personnel under your control. Ensure that all employees work in a safe manner and use all protective devices and procedures required to protect their health and safety.
- Advise all employees of any potential or actual hazards and how to isolate, prevent, or remove them.
- Arrange for medical treatment as required, in the case of injury or illness including transportation to a doctor or hospital.
- Report all incidents immediately, investigate all incidents fully, and advise management on how to prevent similar incidents in the future.
- Carry out regular inspections of the work place to ensure a safe and healthy work environment, and establish provisions for equipment/tool inspection and ongoing maintenance to confirm safety and integrity.
- Evaluate an employee's performance to determine whether the employee is competent at the required work task. Direct supervision should be given to an employee unfamiliar with certain tasks.
- Know the regulations applicable to the work and insist that ES&H regulations are followed.
- Incorporate safety instructions in JSA program and verify that they are working.
- Not allow personnel to take unnecessary risks.
- Ensure that new and short service employees (SSE) are shown the correct method of working and are advised of all safety precautions applicable to their work.
- Ensure that any special rules applying on the site are being implemented correctly and check that any Safe Work Permits are being complied with.
- Commend personnel who, by action or initiative, eliminate hazards.
- Not allow "horse-play" or practical jokes, and discipline those who consistently fail to consider their own safety or that of others around them.

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- Report immediately any defects of procedures, tools or equipment.
- Respond appropriately to incidents reported by employees, however minor, and report incidents as delineated in the JSSP and through the chain of command.
- Set a personal example by wearing protective clothing and by carrying out all work in a safe manner.
- Look for and suggest ways to eliminate hazards and encourage employees to do the same. Bring to the notice of supervision any improvement or addition to the company safety policy that you feel should be made.

1.4.3. Craftsmen and other Personnel Must:

- Read and understand the company's Safety Policy and carry out work in accordance with its requirements.
- Develop and/or review Job Safety Analysis (JSA) prior to commencing work.
- Immediately notify supervisor of any unsafe conditions or acts that may be hazardous to workers or others.
- Use Stop Work Authority as necessary to ensure each individual's personal safety and that of co-workers.
- Use the correct tools and equipment for the job and report any defect noted in tools and equipment.
- Use the safety equipment, personal protective devices, and clothing required on site.
- Complete pre-use inspection on all tools and equipment prior to commencing work
- Mentor new employees and warn them of known hazards and safe work practices.
- Report any incident or damage, however minor, to Supervision.
- Attend all scheduled safety meetings.
- Notify supervisor of prescription and non-prescription medication use prior to coming on job site.
- Take all personal hygiene measures necessary to prevent job related health effects (e.g. dermatitis).
- Take all reasonable precautions to protect the safety of workers and others.
- Openly communicate on issues related to safety.

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1.5. Definitions & Abbreviations

Definitions	

Abbreviations	
BSCM	BrightSource Construction Management

1.6. Applicable Documents

1.6.1. Specific Documents

The following documents form a part of this document as referenced herein.

Doc Number	Doc Title
TBD	Injury and Illness Prevention Plan

1.6.2. Standards

The following documents form a part of this document as referenced herein.

Doc Number	Doc Title

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2. RISK ASSESSMENT AND HAZARD IDENTIFICATION

Risks and hazards listed below have been identified and will be mitigated and dealt with in accordance with the "Guide to Safe Operations" and during the Job Safety Analysis planning of the work.

Each contractor will be responsible to identify their hazards as they relate to their scope of work and provide a hazard mitigation plan for those hazards.

General Hazards	
Risk/Hazard	**Mitigation**
Access/Egress:	Comply with BSCM "Guide to Safe Operations" and facility logistics program for safe access to work areas.
Snakes/Insects:	Monitor job site for snakes and insects. Particular attention shall be directed during work in storage and lay down areas; in case of snake sightings, isolate area. Snake-resistant chaps or gaiters can be used in non-cleared work areas. Use leather gloves for protection from spiders for the hands.
Endangered Species:	Biological Orientation given to all workers on the endangered species of concern and must comply with the Biological conditions. All sightings must be reported to BSCM.
Overhead Power Lines:	Comply with BSCM "Guide to Safe Operations".
Falling Objects:	Comply with BSCM "Guide to Safe Operations". Secure all overhead equipment, tools and material. Use tool tethers, bolt buckets, netting and other provisions to mitigate the risk of falling objects.
Lighting:	Provide appropriate lighting for early or late work activities.
Air Quality:	Comply with BSCM "Guide to Safe Operations" & Site Specific Dust Mitigation Plan. Limit vehicle speed to 10 MPH or less.
Communication:	Employees must be able to communicate in English, or use bi-lingual foremen. Ensure all employees ability to understand and communicate hazards and institute Stop Work Authority.
Noise:	Comply with BSCM "Guide to Safe Operations". Wear proper PPE.
Crane & Lifting Operations:	Comply with BSCM "Guide to Safe Operations" and Crane and Lifting program. Only trained and authorized crane operators and riggers will be used.
Material Handling and Storage:	Comply with BSCM "Guide to Safe Operations". All materials shall be stored to avoid tipping or unstable stacks. Isles shall be clearly identified and maintained open and clean. Lifting and moving equipment shall be provided for safe transfer of materials.

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Mobile Equipment:	Comply with BSCM “Guide to Safe Operations” and equipment must be provided with backup alarms and fire extinguishers.
Waste Disposal:	Comply with BSCM “Guide to Safe Operations” and waste disposal containers must be provided and used.
Power Tools:	Comply with “Guide to Safe Operations”
Emergencies	
Flood	Suspend work in the area and evacuate personnel to employee parking lot, notify 911 if needed, notify BSCM for accountability and wait for further direction.
Fire	Suspend work in the area and evacuate personnel to employee parking lot, notify 911 if needed, notify BSCM for accountability and wait for further direction.
Earthquake	Suspend work and evacuate personnel to employee parking lot, notify 911 if needed, notify BSCM for accountability and wait for further direction.
Spill	Suspend work in the area identify spilled substance; Comply with BSCM “Guide to Safe Operations” and Notify BSCM
Medical Emergencies	Notify 911 and BSCM, comply with BSCM “Guide to Safe Operations”
Specific Hazards	
Working at Heights:	Comply with BSCM “Guide to Safe Operations” and company specific fall protection procedures. Fall protection required at 6’. Falling object protection will be required for persons working below.
Steel Erection:	Comply with BSCM “Guide to Safe Operations” and the companies steel erection plan.
Lockout / Tagout (LOTO):	Comply with BSCM “Guide to Safe Operations” and the site-specific LOTO program.
Confined Space:	Comply with BSCM “Guide to Safe Operations” and use permit system for all confined space work.
Excavation/Trenching:	Comply with OSHA, and BSCM “Guide to Safe Operations”. Work under direction of identified “Competent Person”. Check for underground interferences.
Cave-In prevention	Comply with OSHA, and “Guide to Safe Operations”. Use proper shoring or sloping work methods. If over 4 feet deep use permit system.
Buried Hazards	Notify Dig Alert 48 hrs in advance; Comply with “Guide to Safe Operations” If unidentified objects encountered stop work and notify BSCM.
Ergonomics:	Vary posture for repetitive work tasks, keep work station height and reach postures at neutral body position to reduce overextending the body.

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Fabrication & Laydown:	Comply with BSCM “Guide to Safe Operations”. Practice good housekeeping to provide safe access and prevent tripping/fall hazards. Stack items level to avoid unstable objects.
Hazardous Materials:	Comply with BSCM “Guide to Safe Operations” & follow company HAZCOM program; including MSDS Sheets, container labeling, employee training and notifying BSCM of all chemical and substances brought onto the project.
Fab/Assembly Building:	Comply with, BSCM “Guide to Safe Operations” and the assembly building safety plan and standard instructions.
Weather:	Comply with BSCM “Guide to Safe Operations”. BSCM will monitor weather conditions for early warning on storm or adverse weather.
Heat Related Issues:	Comply with BSCM “Guide to Safe Operations” and Ensure hydration and rest periods in shaded area.

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3. RELEVANT SAFETY PROGRAMS AND PROCEDURES

Safety Programs that are directly involved in the project are listed below:

Programs/Procedures	Description of Program or Procedures
Behavior Based Safety(BBS)	All companies and contractors will participate in the BBS program that is required.
Confined Space	Any confined space entry will be considered “Permit Required” and additional training and issuing a permit will be required for all entries.
Cranes/Hoists	Crane Operators must be qualified to operate the equipment and a lift plan will be developed for all lifts over 5 tons. Some may be considered critical and may required additional planning.
Electrical Safety	GFCI are required for all portable electrical tools used.
Excavation	Follow Cal-OSHA required safety protection for all excavations or trenches greater than 4 feet in depth. May be considered Confined Space
Equipment Inspection	All mobile equipment will be inspected upon arrival and prior to use with documentation maintained.
Fall Protection	100% Fall protection is required for all employees that are exposed to a fall of greater than 6 feet to a lower level or the ground. This is measured from the feet.
Hand/Power Tools	All power and hand tools will be inspected prior to use and tagged and removed from service if they are defective.
HAZCOM	Each contractor company shall develop and maintain a HAZCOM program as needed for their chemicals. Training must be provided and documented on site. BSCM must receive copies of all MSDS
Heat/Cold Stress	Provisions must be made for drinking water and cooling stations for all workers during hot weather. At temperature at or above 110 degrees active work shall be evaluated for work / rest cycles or other work restricting measures.
Hot Work	Areas of hot work will be cleared of vegetation and other combustible or flammable material. A suitable fire extinguisher will be located within 20 feet of the area. If combustibles or flammables cannot be removed a Hot Work Permit will be used.

Rigging	Rigging will be performed only by qualified riggers.
LOTO	All energy isolation programs shall be complied with.
Pipeline Locate	Use the One Call system
Site Inspections	Each contractor shall conduct weekly site inspections and document the findings. All required corrective actions shall be completed timely and shall be tracked to completion.
Vehicle/Equipment Operations	All equipment and vehicles will be operated by trained approved operators.
Illness & Injury	The Site-Specific Cal-OSHA IIPP plan will be adhered to on the project.

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4. EDUCATION AND TRAINING

All personnel working on the site will undergo safety training as required.

- All personnel working on the project shall attend the EH&S Training Tortoise Certification and WEAP Training.
- All supervisors, Foreman or lead persons shall receive a. above plus the additional Persons Leading Work (PLW) training.
- Project Management and Superintendents shall receive a. above plus the additional Operational Excellence Leadership Seminar (OELS) Training.

A list will be maintain for the site of required training undergone by project personnel, and will ensure that site personnel have undergone any special skill training. Selected topics will be as follows:

Description	**Narrative** (Describe applicable training and provide documentation onsite)
Back Injury Prevention	Topic to be addressed in Site-Specific Orientation, tailgate" safety meetings and in task specific JSA.
Basic New Employee Orientation	In accordance with SSSP Plan
Basic Principles of Safety	All employees trained to relevant level and project requirements.
Behavior Based Safety	In accordance with BSMC Plan
Confined Space Entry	As needed personnel must be trained and refreshed bi-annually to relevant level.
Cranes and Material Handling	All operators to have appropriate Certification
Electrical Safety	Topic to be addressed in Site-Specific Orientation, tailgate" safety meetings and in task specific JSA.
Emergency Evacuation/Response Plan	Topic to be addressed in Site-Specific Orientation, tailgate" safety meetings and in task specific JSA.
Excavation and Trenching	Topic to be addressed in Site-Specific Orientation, tailgate" safety meetings and in task specific JSA.
Fall Protection	Topic to be addressed in Site-Specific Orientation, tailgate" safety meetings and in task specific JSA.
Fire Safety	Topic to be addressed in Site-Specific Orientation, tailgate" safety meetings and in task specific JSA.

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Description	Narrative (Describe applicable training and provide documentation onsite)
First Aid (CPR, EMS)	All supervisory personnel trained and refreshed bi-annually to relevant level.
Hazard Communication (MSDS), Labeling, etc.	Topic to be addressed in Site-Specific Orientation, tailgate" safety meetings and in task specific JSA.
Hazard Identification and Awareness	Employees to receive training on hazard awareness.
Hazardous Energy Lock-Out	Onsite training and oversight by Safety Manager. Affected employees will receive additional LOTO training.
Heat and Cold Stress Prevention	Topic to be addressed in Site-Specific Orientation, tailgate" safety meetings and in task specific JSA.
Incident Investigation and Reporting	Topic to be addressed in Site-Specific Orientation, tailgate" safety meetings and in task specific JSA. All supervisory personnel trained to relevant level.
Job Safety Analysis	Prepared and reviewed with all employees daily (or more often as required) by Safety Manager
Near Miss Reporting	Same as Incident Investigation and Reporting
Personal Protective Equipment	In accordance with Site Specific ES&H Plan and PSMP
Power Actuated Tools	Topic to be addressed in "tailgate" safety meetings and in task specific JSA.
Safety Culture/Commitment Training	In accordance with Site Specific ES&H Plan and PSMP. Implement Safety Culture through training and practice.
Safety Observation/Audit	Supervisors will receive additional training.
Scaffolding Safety	As required for scaffold users
Start-up Safety Workshop	All involved employees will receive additional training for the hazards associated with start-up operations.
Welding/Cutting	Topic to be addressed in Site-Specific Orientation, tailgate" safety meetings and in task specific JSA.

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5. HAZARD COMMUNICATION

5.1. Chemicals Brought on Site

A Chemical Inventory List will be maintained on site and will be included in MSDS Binder. The binder will be located in the Safety Office and tool rooms.

Specific chemical handling instructions must be included in the JSA for the task.

MSDS's shall be available for each chemical brought on site. MSDS's for the chemicals will be reviewed during the pre-job hazard review. There must be a MSDS to correspond with each item on the Chemical Inventory List. They are to be reviewed with all employees prior to commencing work and made readily available for easy reference. BSCM must receive copies of all MSDS.

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6. PERSONAL PROTECTIVE EQUIPMENT (PPE)

6.1. Minimum PPE Required Throughout the Job at All Times:

- Hard Hats worn with bill to front
- Safety Glasses with side shields
- Safety-Toed Footwear
- High Visibility vests, shirts or jackets.
- Snake protection (until site cleared).

6.2. Additional PPE Considerations:

Employees shall not wear loose clothing, hooded sweatshirts, apparel with drawstrings and any other apparel that appears ragged or torn.

Hearing protection shall be worn in high noise areas or using equipment that emits noise in excess of 85 Dba.

Respirators, welding equipment or any other PPE equipment required will be determined and monitored by the Safety Manager.

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7. SAFE WORK PERMITS

Safety Manager will prepare and/or monitor any required permits. Permits will be available for review by personnel prior to commencement of work. All permits will be described and discussed with personnel during JSP meetings.

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8. ENVIRONMENTAL

8.1. Wastes Generated:

Typical construction site wastes are anticipated for the project. All waste streams will be reviewed and classified by the Responsible Safety Manager. Waste equipment fluids and solvents may be generated during equipment maintenance and will be handled properly.

8.2. Waste Management Procedure

All waste will be removed from the site. Typical waste will be stored in covered and secured trash receptacles. Equipment fluids and solvents will be collected during servicing and removed by authorized personnel from site.

8.3. Permit Compliance

Storm Water Pollution Prevention Plan is contained within contract documents. Compliance shall be under supervision of site superintendent.

8.4. Spill Prevention and Containment

Any spills that occur will be contained in accordance with Federal and State regulations. Specific direction is contained in Site Specific ES&H Plan.

8.5. Sensitive Area Protection

Before start of work near any sensitive areas a fence will be placed to restrict work in these areas.

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9. MANAGING CONTRACTORS

BSCM and all its contractors will follow the Site Specific procedures including their specific company procedures that pertain to their scope of work. BSCM will provide sufficient support and oversight to safely manage contractors' work.

Contractors shall be sufficiently qualified to perform their work on this project; qualifications shall be verified by BSCM.

Training documentation must be on site for all employees.

Drug and Alcohol program must be consistent with the site requirements.

Incident injury reporting procedure is in place (24 hour emergency contacts, phone lists, and medical management plan is complete and well coordinated with contractors).

Audit/inspection provisions are established by contractors for reviewing work on site.

Shared services between contractors, subcontractors, vendors, suppliers and other service providers are coordinated by Project Manager.

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10. AUDITS, INSPECTIONS, AND PLANNED OBSERVATIONS

Job safety will be ensured using various audit programs. Tailgate safety meetings, JSA's, site visits by engineering and safety personnel will be utilized. All activity will be tracked and reported. Any deficiencies/discrepancies discovered will be addressed and corrected immediately.

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11. MOTOR VEHICLE SAFETY

Motor vehicle safety will be practiced in accordance with Site Specific Motor Vehicle Safety Procedure. Maximum vehicle speed limit onsite shall be 10 MPH. Safety Manger will determine if and when speed limits should be adjusted.

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12. SECURITY MEASURES

Entire job site is secured with a chain link fence and access will be controlled via secured gates.

All materials and supplies will be stored in locked containers.

Security guard will be provided to control main gate access.

All employees, visitors, vendors and delivery vehicles will be stopped at the entrance gate and must be approved for entry to the site. All assigned employees will be provided with site-issued identification for entry.

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13. STOP WORK AUTHORITY

Every employee and contractor onsite **is responsible and authorized** to stop any work that does not comply with the MSC tenets of operation. There will be no repercussions for exercising Stop Work Authority; it is a right and a responsibility.

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14. SHORT-SERVICE EMPLOYEE (SSE) IDENTIFICATION AND MENTORING

Any contractor personnel with less than 6 months experience in the same job type will be considered a short-service employee (SSE). All requirements regarding SSE's will be followed.

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15. COMMUNICATION

Standard communication will be provided via person-to-person onsite discussions, radio, land line and cellular telephone, email and other methods as required.

Communication of safety information is done through the onsite Safety Manager. Job safety will be ensured and communicated via tailgate safety meetings, authorization to work meetings, JSA's, and site visits by engineering and safety personnel.

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16. INCIDENT, INJURY, AND ILLNESS MANAGEMENT

Bright Source Construction Management will implement for this job its Illness and Injury Prevention Program. In the event of an injury, accident, fire, or other emergency the following emergency contacts will be made by immediately involved personnel or by BSCM Safety Manager, as applicable.

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17. EMERGENCY CONTACTS FOR RIO MESA SOLAR

Company:	**BrightSource Construction Management (BSCM)**				**Date:**
Location:	**Rio Mesa Solar Project**	**City:**		**State:**	**California**
Project Name:	**Rio Mesa Solar**				
Management/Responsible Individual Contact List					
Position	**Name**	**Cell Phone**	**E-mail**		
BSCM Project Director					
BSCM Safety Manager					
BSCM Compliance Manager					

First Aid/Minor Treatment Facility/Bechtel Registered Nurse/On-site	
Emergency Medical Treatment Facility/Concentra Medical 24hr. Las Vegas	
Emergency Transportation Provider	
County of Riverside Sheriff's Office	
County of Riverside Fire Department	

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ATTACHMENT DR 76-1

JURISDICTIONAL DELINEATION GPS POINTS

OBJECTID	Wash_ID	Location	Add_Info	Width	Depth	Substrate	Pic_up	Pic_up_dir	Pic_down	Pic_down_dir	Slope	Flow_dir
3	kit fox family	MWD										
4	R1	Null	Riparian margin north, Palo verde									
5	T13 R2	Null	southern limit of riparian, Palo Verde									
6	T13 TOB 2	Null	top of bank south									
7	Y2	Null	high flow channel									
8	T13 Y1	Null	high flow channel north									
9	T13 X1	Null	liw flow channel north									
10	T13 X2	Null	low flow channel south									
11	T13 Y3	Null	high flow channel south									
12	T13 Y4	Null	high flow channel north									
13	T 13 X4	Null	low flow channel north									
14	T13 X3	Null	low flow channel south									
15	T13 C1 Q7 042111 D	MWD	center disturbed from ROV use	135							2%	W2E
16	T13 Y6	Null	high flow channel north									
17	TOB 2	Null	north									
18	T13 Y5	Null	low flow channel south									
19	T13 X5	Null	low flow channel south									
20	T13 X6	Null	low flow channel north									
21	T13 low terrace bndry	Null	kow terrace boyndary north									
22	T13 lw terrace bndry	Null	kow terrace boundary south									
23	T11 low terrace south	Null	low terrace margin									
24	T11 TOB1	Null	begin active flood plain, top of bank south									
25	T11 low tereace bndry	Null	low terrace boundary north									
26	T11 paleo channel	Null										
27	paleo channel	Null										
28	T11 ast fld pln	Null	active flood plain limit north									
29	T11 Y1	Null	low flow channel									
30	T11 Y2	Null	Y=X, high flow channel	4								
31	T11 y3	Null	high flow channel									
32	T11 y4	Null	x=y, high flow channel north									
33	T11 C1 M7 042111 D	MWD	center point of main channel	4	6inch	Sand					2-3%	w2e
34	T02 TOB	Null	TOB near cliff wall									
35	T02 Y1	MWD										
36	T02 X1	Null	low flow channel margin									
37	T02 X2	Null	low flow channel margin north									
38	T02 Y2	MWD	high flow channel margin north									
39	T02 TOB	MWD	top of bank									
40	T02 C1 H3-37 042211 D	MWD	Center of channel	35	3.5	Sand					2%	west to east
41	T02 paleo channel	MWD	Paleo channel at center									
42	T02 paleo channel 02	MWD	Paleo Channel 02 at center	21	5inches							
43	T02 C2 H3-37 042211 D	MWD	center of active channel	18	6inch	Sand					1 %	west to east
44	T02 X1	MWD	low flow channel margin south									
45	T02 X2	Null	low flow channel margin north	5	4inch							
46	T02 Y1	Null	high flow channel south									
47	T02 TOB	MWD	top of bank									
48	T02 Y2	MWD	high flow channel north	13	7inch							

49	T02 TOB	MWD	top of bank north	23	13inch				
50	T03 C3 G3-31 042211 D	MWD	center of channel	45	2.5	Sand & gravels		1%	west to east
51	T02 C3 TOB	MWD	Top of bank						
52	T02 C3 Y1	MWD	high flow channel margin south						
53	T02 C3 X1	MWD	low flow channel margin south						
54	T02 C3 X2	MWD	low flow channel margin north	7	3inch				
55	T02 C3 X3	MWD	low flow channel margin south						
56	T02 C3 X4	MWD	low flow channel margin north	4	3inch				
57	T02 C3 Y2	MWD	high flow channel north	45	2				
58	T02 C3 TOB	MWD	TOP OF BANK						
59	T02 C4 G3-31 042211 D	MWD	center of channel	37	1.5			1%	west to east
60	T02 C4 TOB	MWD	tOP OF BANK						
61	T02 C4 Y1	MWD	high flow channel						
62	T02 C4 X1	MWD	low flow channel margin south						
63	T02 C4 X2	MWD	low flow channel margin north						
64	T02 C4 Y2	MWD	high flow channel north						
65	T02 C4 TOB	MWD	TOP OF BANK north						
66	T02 C5 G3-31 042211 D	MWD	center of channel	32	16 inch	course sand gravel & cobbles		1%	w2e
67	T02 C5 TOB	MWD	Top OF BANK						
68	T02 Y1	MWD	high flow channel margin south						
69	T02 C5 X1	MWD	low flow channel margin south						
70	T002 C5 X2	MWD	low flow channel margin north	5	5inch				
71	T02 C5 Y2	MWD	high flow channel north	32	13inch				
72	T02 C5 TOB	MWD	Top OF BANK north						
73	T02 paleo Channel	Null							
74	T02 C6 G3-31 042211 D	MWD	center of channel	38	14inch	Sand & cobble		1%	w2e
75	T02 C6 TOB	MWD	Top OF BANK						
76	T02 C6 Y1	Null	high flow channel margin south						
77	T02 C6 X1	MWD	low flow channel margin south						
78	T02 C6 X2	MWD	low flow channel margin north	8	4inch				
79	T02 C6 Y2	MWD	high flow channel north						
80	T02 C6 TOB	MWD	Top OF BANK north						
81	T02 C7 G3-31 042211 D	MWD	center of channel	22	11unch			1%	w2e
82	T02 C7 TOB	MWD	top OF BANK south						
83	T02 C7 Y1	MWD	high flow channel margin south						
84	T2 C7 X1	MWD	low flow channel margin south						
85	T02 C7 X2	MWD	low flow channel margin north	14	3inch				
86	T02 C7 Y2	MWD	high flow channel north						
87	T02 C7 TOB	MWD	top OF BANK north						
88	T02 C7 R2	MWD	end of riparian						
89	R1	BLM Land							
90	R2	BLM Land							
91	TOB1	Null	NORTH BANK		40				
92	TOB1	Null	NORTH BANK		40				
93	TOB2	Null							
94	Y2	Null							
95	X1	Null							

96	X2	Null											
97	X3	Null											
98	X4	Null											
99	X5	Null											
100	X6	Null											
101	X7	Null											
102	X8	Null											
103	X9	Null											
104	X10	Null											
105	X11	Null											
106		X12											
107	X13	Null											
108	X14	Null											
109	X15	Null											
110	X16	Null											
111	X17	Null											
112	X18	Null											
113	X19	Null											
114	X20	Null											
115	X21	Null											
116	X22	Null											
117	C	Null		15	2	Cobbles	1	WEST	1	EAST	1	EAST	
118	X23	Null											
119	X24	Null											
120	X25	Null											
121	X26	Null											
122	X27	Null											
123	X28	Null											
124	X29	Null											
125	X30	Null											
126	X31	Null											
127	X32	Null											
128	Y1	Null											
129	TOB1	Null			30								
130	R1	Null											
131	TOB2	Null											
132	Y1	Null	OHWM LIMIT										
133	X1	Null											
134	X2	Null											
135	X3	Null											
136	X4	Null											
137	X5	Null											
138	X6	Null											
139	Y2	Null											
140	C	Null		40	1	Sand	546 RB CAMERA	NW	547	SE	1	SE	
141	TOB1	Null											
142	Y1	Null		2									

143	Y2	Null	
144		Null	
145	TOB2	Null	
146	TOB3	Null	
147	Y3	Null	8
148	Y4	Null	
149	TOB4	Null	
150	TOB5	Null	5
151	Y5	Null	4
152	Y6	Null	
153	TOB6	Null	
154	TOB7	Null	7
155	Y7	Null	6
156	Y8	Null	
157	TOB8	Null	
158	TOB9	Null	4
159	Y9	Null	3
160	Y10	Null	
161	TOB10	Null	
162	TOB11	Null	6
163	Y11	Null	4
164	Y12	Null	
165	TOB12	Null	
166	TOB13	Null	4
167	Y13	Null	3
168	Y14	Null	
169	TOB14	Null	
170	TOB17	Null	12
171	Y17	Null	12
172	Y18	Null	
173	TOB18	Null	
174	TOB19	Null	3
175	Y19	Null	3
176	Y20	Null	
177		TOB20	
178	TOB21	Null	12
179	Y21	Null	
180	Y22	Null	
181	TOB22	Null	
182	TOB23	Null	9
183	Y23	Null	4
184	Y24	Null	
185	TOB24	Null	
186	TOB25	Null	9
187	Y25	Null	7
188	Y26	Null	
189	TOB26	Null	

190	TOB27	Null			4	
191	Y27	Null			4	
192	Y28	Null				
193	TOB28	Null				
194	TOB29	Null			30	
195	Y29	Null			30	
196	Y30	Null				
197	TOB30	Null				
198	TOB31	Null			5	
199	Y31	Null			5	
200	Y32	Null				
201	TOB32	Null				
202	TOB33	Null			5	
203	Y33	Null			5	
204	Y34	Null				
205	TOB34	Null				
206	TOB35	Null			21	
207	Y35	Null				
208	Y36	Null				
209	TOB36	Null				
210	r1	BLM Land				
211	r2	BLM Land				
212	c1	BLM Land				Sand
213	R1	MWD				
214	TOB1	MWD				
215	Y1	MWD				
216	X1	MWD				
217	X2	MWD				
218	Y2	MWD				
219	Y3	MWD				
220	X3	MWD				
221	X4	MWD				
222	Y4	MWD				
223	Y5	MWD				
224	X5	MWD				
225	X6	MWD				
226	Y6	MWD				
227	TOB2	MWD				
228	R2	MWD				
229	T5 J3K3 042011 B	MWD	C		50+	
230	R1	MWD				
231	TOB1	MWD				
232	Y1	MWD				
233	X1	MWD				
234	X2	MWD				
235	Y2	MWD				
236	Y3	MWD				

237	X3	MWD										
238	X3	MWD										
239	X4	MWD										
240	Y4	MWD										
241	TOB2	MWD										
242	R2	MWD										
243	T9 J5K5 042011 B	MWD	C		50+	3	Sand		5676		5677	<5% east
244	R1	MWD										
245	TOB1	MWD										
246	Y1	MWD										
247	X1	MWD										
248	X2	MWD										
249	Y2	MWD										
250	Y3	MWD										
251	X3	MWD										
252	X4	MWD										
253	Y4	MWD										
254	Y5	MWD										
255	X5	MWD										
256	X6	MWD										
257	Y6	MWD										
258	Y7	MWD										
259	X7	MWD										
260		Null										
261	X8	MWD										
262	Y8	MWD										
263	Y9	MWD										
264	X9	MWD										
265	X10	MWD										
266	Y10	MWD										
267	TOB2	MWD										
268	R2	MWD										
269	T9 J5K5 042011 B	MWD	C2		50+	3	Sand		5687		5688	east
270	TOB1	Null										
271	Y1	Null										
272	Y2	Null										
273	TOB2	Null										
274	TOB3	Null										
275	Y3	Null										
276	Y4	Null										
277	TOB4	Null										
278	TOB5	Null			5							
279	Y5	Null			5							
280	Y6	Null										
281	TOB6	Null										
282	TOB7	Null										
283	Y7	Null			1							

284	Y8	Null											
285	TOB8	Null											
286	TOB9	Null											
287	Y9	Null											
288	X1	Null		21									
289	X2	Null											
290	X3	Null		30									
291	X4	Null											
292	X5	Null		21									
293	X6	Null											
294	X7	Null		50									
295	X8	Null											
296	CENTER	Null			1	Sand	118 CM CAMERA	W	119	E	1	E	
297	Y10	Null											
298	TOB10	Null											
299	R1	Null											
300	TOB1	Null											
301	Y1	Null											
302	X1	Null											
303	X2	Null											
304	Y2	Null											
305	TOB2	Null											
306	R2	Null											
307	CENTER	Null			2	Sand	120	W	121	E	1	E	
308		Null											
309	R1	BLM Land											
310	R2	BLM Land											
311	r1	BLM Land					26-34						
312	tob1	BLM Land					35-41						
313	y1	BLM Land											
314	x1	BLM Land					41-43						
315	y2	BLM Land											
316	y2a	BLM Land											
317	y3	BLM Land											
318	x3	BLM Land	x3 1ft below y3				44-46						
319	x4	BLM Land											
320	y4	BLM Land											
321	tob2	BLM Land					47-52						
322	tob3	BLM Land					53-58						
323	y5	BLM Land											
324	x5	BLM Land					59-61						
325	x6	BLM Land											
326	y6	BLM Land	y6 1.5ft above x6										
327	tob4	BLM Land					62-67						
328	tob5	BLM Land					73-78						
329	y7	BLM Land											
330	x7	BLM Land		24 in			31-33						

331	x8	BLM Land							
332	y8	BLM Land							
333	tob6	BLM Land					34-39		
334	tob7 and y9	BLM Land					40-45		
335	x9	BLM Land					46-48		
336	x10	BLM Land							
337	y10	BLM Land							
338	tob8	BLM Land					48-53		
339	tob9	BLM Land					54-59		
340	y11	BLM Land							
341	x11	BLM Land	x11 0.5 ft below y11	43 in					
342	x12	BLM Land							
343	y12	BLM Land							
344	y13	BLM Land							
345	x13	BLM Land		17 in			63-66		
346	x14	BLM Land							
347	tob10 and y14	BLM Land					67-72		
348	tob11	BLM Land					73-78		
349	x15	BLM Land		55 in			78-80		
350	y16 and x16	BLM Land							
351	tob12	BLM Land					81-86		
352	tob13	BLM Land					87-92		
353	y17	BLM Land							
354	x17 and x18	BLM Land	11 in wide				93-94		
355	y18	BLM Land							
356	tob14	BLM Land					95-100		
357	r2	BLM Land					101-108		
358	T6L142011A	BLM Land	C		Sand		video 109	1-5	east
359	r1	BLM Land							
360	tob2	BLM Land					76-80		
361	y1	BLM Land							
362	x1	BLM Land							
363	x2	BLM Land							
364	y2	BLM Land							
365	y3	BLM Land							
366	x3	BLM Land							
367	x4	BLM Land							
368	y4	BLM Land							
369	tob2	BLM Land					81-84		
370	r2	BLM Land							
371	tob3 and y5	BLM Land					85-88		
372	x5 and x6	BLM Land	1 ft wide						
373	y6	BLM Land							
374	tob4	BLM Land							
375	tob5	MWD					89-92		
376	y7	MWD							
377	x7	MWD							

378	x8	MWD										
379	y8	MWD										
380	tob6	MWD										
381	r3	MWD										
382	tob7	MWD						93-97				
383	y9	MWD										
384	x9	MWD										
385	x10	MWD										
386	y10	MWD										
387	y11 and x11	MWD										
388	y12 and x12	MWD										
389	tob8	MWD						98-101				
390	tob9, y13 and x13	MWD						102-105				
391	tob10, y14 and x14	MWD										
392	r4	MWD										
393	T1E6042111A	Null	C	20-50	3 ft	Sand					0-5	east
394	T1E6042111A	BLM Land	C2	50+ feet	2 ft	Sand					0-5	east
395	r1	MWD										
396	tob1	MWD						106-111				
397	y1 and x1	MWD										
398	x2	MWD										
399	y2	MWD										
400	y3 and x3	MWD										
401	x4	MWD										
402	y4	MWD										
403	y5	MWD										
404	tob3	MWD										
405	x5 and x6	MWD	2 ft wide									
406	y6	MWD										
407	y7	MWD										
408	x7 and x8	MWD	2 ft wide									
409	x9	MWD						112-115				
410	y8 and x10	MWD										
411	tob4	MWD						116-121				
412	r2	MWD										
413	T7K6L5042111A	MWD	C	50+ ft	5 ft	Sand					0-5	east
414	tob2	MWD										
421	Drainage 02	MWD	photopoint 01									
422	Drainage 02	MWD	Photopoint 02									
423	Drainage 02	MWD	Photopoint 03									
424	Drainage 03	MWD	photopoint 01									
425		MWD	photopoint 01									
426		MWD	photopoint 03									
415	wet 01	MWD	state wetland									
416	DR 01 photopoint 01	MWD	photopoint 01									
417	Drainage 01	MWD	photopoint 02									
418	plant point	MWD	Mamillaria tetrancistra									

419	plant point	MWD	Mamillaria grahamii
420	Drainage 01	MWD	photopoint 03

Trib	Trib_bb	OHWM	CLN	Soil_chang	Shelving	Veg_Matt	Litter_dist	Sediments	Water_stn	Litter_pres	Veg_destr	Sediment_	Scour	Multi_flow	Abrupt_ch	Other
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yes to C1	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
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Veg_type	Veg_wdth	Blue_ln	LATR	OLTE	AMDU	PLRI	PRGL	PAFL	PSSP	HYSA	LYAN	SUMO	Plant_othe	Wildlife
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scrub - tree	15	No	Yes	Yes	No	No	No	Yes	No	No	No	No
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tree - scrub	15	No	Yes	Yes	No	No	No	Yes	No	No	No	No
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scruv - tree	30	No	Yes	Yes	No	No	No	Yes	No	No	No	No
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scryb - tree	25	Yes	Yes	Yes	No	No	No	Yes	No	No	No	No
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DESERT WASH WOODLAND	Y1 TO Y2	Yes	No	Yes	No	No	No			No			DESERT WA	
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DESERT WASH WOODLAND	FROM Y2 TO R1	Yes	No	Yes	No	Yes	No		No	Yes	No			
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4/20/2011	703817.6599	3704914.271
4/21/2011	707751.3731	3708877.942
4/21/2011	707759.2887	3708871.028
4/21/2011	707758.0308	3708868.723
4/21/2011	707756.1689	3708860.803
4/21/2011	707756.0582	3708859.179
4/21/2011	707756.436	3708856.245
4/21/2011	707750.9078	3708839.657
4/21/2011	707750.8579	3708835.502
4/21/2011	707751.4602	3708831.205
4/21/2011	707751.8602	3708829.107
4/21/2011	707750.7222	3708827.855
4/21/2011	707749.4793	3708822.262
4/21/2011	707744.5569	3708806.247
4/21/2011	707743.7154	3708804.535
4/21/2011	707743.912	3708800.946
4/21/2011	707743.446	3708796.259
4/21/2011	707750.9838	3708755.766
4/21/2011	707751.376	3708756.187
4/21/2011	707751.5086	3708755.643

4/21/2011	707751.7298	3708754.869
4/21/2011	707751.9259	3708754.111
4/21/2011	707752.2151	3708753.489
4/21/2011	707754.3106	3708750.497
4/21/2011	707758.9533	3708701.933
4/21/2011	707758.6479	3708700.144
4/21/2011	707762.2923	3708692.794
4/21/2011	707761.2044	3708681.882
4/21/2011	707763.3833	3708680.132
4/21/2011	707767.2504	3708670.501
4/21/2011	707767.7168	3708669.42
4/21/2011	707768.9597	3708662.141
4/21/2011	707773.2426	3708638.25
4/21/2011	707775.0498	3708639.223
4/21/2011	707780.8463	3708639.709
4/21/2011	707763.2036	3708689.835
4/21/2011	707757.3419	3708849.005
4/21/2011	707816.7888	3705275.414
4/21/2011	707819.9739	3705263.39
4/21/2011	707818.4698	3705260.184
4/21/2011	707818.0977	3705258.967
4/21/2011	707817.056	3705248.247
4/21/2011	707791.786	3705192.078
4/21/2011	707792.4918	3705191.041
4/21/2011	707792.7622	3705190.289
4/21/2011	707781.7134	3705162.991
4/21/2011	707780.8508	3705163.465
4/21/2011	707781.4331	3705161.539
4/21/2011	707771.3715	3705134.821
4/21/2011	707766.4729	3705110.243
4/21/2011	707767.1081	3705109.177
4/21/2011	707765.8226	3705095.386
4/21/2011	707766.3284	3705094.132
4/21/2011	707739.7575	3705033.27
4/21/2011	707732.4142	3705026.924
4/21/2011	707773.4497	3705136.845
4/21/2011	707804.2531	3705250.599
5/7/2011	704949.0908	3706251.379
5/7/2011	704987.72	3706218.603
5/7/2011	705036.9302	3706186.157
5/7/2011	704946.339	3706195.481
5/7/2011	705837.3371	3707299.479
5/7/2011	706096.4662	3706952.693
5/7/2011	705099.1569	3706166.93
5/7/2011	704870.0019	3706335.179
5/7/2011	704932.6657	3706291.841
5/7/2011	705019.5018	3706204.056

5/7/2011	705043.8893	3706208.657
5/7/2011	705051.238	3706204.016

ATTACHMENT DR 76-2

JURISDICTIONAL DELINEATION GPS LINES

OBJECTID	Wash_ID	Location	Add_Info	Width	Depth	Substrate	Pic_up	Pic_up_dir	Pic_down	Pic_down_dir	Slope	Flow_dir	Trib	Trib_bb	OHWM	CLN	Soil_change
1	blue line compair	MWD													Null	Null	Null
2		Null													Null	Null	Null
3	T02 active flood plain	Null	active flood plain	220 meters											Null	Null	Null
4		Null													Null	Null	Null
5		Null													Null	Null	Null
6		Null													Null	Null	Null
7	UNNAMED BLUE LINE R6-1	Null	GIS TO EXTEND	2	.5										Null	Null	Null
8	R6-2	Null	GIS TO EXTEND DOWNSLOPE				128	NW	129	SE						Null	Null
9	R7-1	Null	GIS TO EXTEND DOWNSLOPE	3	1		130	NW	131	SE						Null	Null
10		Null		35	8inch											Null	Null
11		Null		2	5 inch										Null	Null	Null
12		Null		2.5	.5										Null	Null	Null
13		Null		1.8	4 inch										Null	Null	Null
14		Null		3.5	2 inches										Null	Null	Null
15		Null		varies											Null	Null	Null
16		Null		20	1.4										Null	Null	Null
17		Null		18	1.3										Null	Null	Null
18		Null		6	5 inches										Null	Null	Null
19		Null		22	.75										Null	Null	Null
20		Null		15	2										Null	Null	Null
21		Null		7	1										Null	Null	Null
22		Null		27	1.3										Null	Null	Null
23	drainage	MWD	drainage outfall from wetland 01	11	2.75	Sand					2%	west to east	yes	Yes	Yes	Yes	Yes
24	DR 001	MWD	ephemeral drainage	18	5	Cobbles					5%+	west to east	yes	Yes	Yes	Yes	Yes
25	Drainage 01	MWD	anastomose	2	4 inches	Cobbles					4%	nw to se	yes	Yes	Yes	Yes	Yes
26	Drainage 02	MWD	ephemeral drainage	5	.33	Cobbles					4%	west to east	yes	Yes	Yes	Yes	Yes
27	Drainage 02	MWD	tributary	2	..25										Null	Null	Null
28	Drainage 02	MWD	tributary	2	.25										Null	Null	Null
29	Drainage 03	MWD	ephemeral drainage	4	.5												
30		Null													Null	Null	Null
31	Drainage 06	MWD	lg ephemeral drainage	40	3	Cobbles					3%	west to east	yes	Yes	Yes	Yes	Yes
32		Null													Null	Null	Null
33		Null													Null	Null	Null
34		MWD	data redo	8	.5										Null	Null	Null
35		Null		3.5	.33										Null	Null	Null
36		MWD	anastomose	3	.25										Null	Null	Null
37		MWD		3.5	.68										Null	Null	Null
38		MWD		3.5	.33										Null	Null	Null
39		MWD		2	.33										Null	Null	Null
40		MWD	ephemeral drainage	20	.75	Sand					2%	NW-SE			Yes	Yes	Yes

Shelving	Veg_Matt	Litter_disturbed	Sediments	Water_stn	Litter_present	Veg_destroy	Sediment_sort	Scour	Multi_flow	Abrupt_chng	Other	Veg_type	Veg_wdth	Blue_ln	LATR	OLTE	AMDU	PLRI
Null	Null	Null	Null	Null	Null									Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes		Olneya, Pleuraphis	70	No		Yes		Yes
Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes		Pleuraphis , Olneya scrub	18	No	Yes	Yes	No	Yes
Yes	No	No	Yes	No	No	No	Yes	Yes	Yes	No				Null	Null	Null	Null	nULL
No	No	Yes	No	Yes	No	No	Yes	Yes	Yes	No				No			Yes	
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Olneya scrub	15	No	Yes	Yes	No	Yes
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Null	Null	Null	Null	Null	Null	Null	Null	Null	Null	Null				Null	Null	Null	Null	nULL
Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes		Olneya scrub	15	No	Yes	Yes	Yes	No

PRGL	PAFL	PSSP	HYSA	LYAN	SUMO	Plant_other	Wildlife	Comments	SHAPE_Length	Date_	X_UTM	Y_UTM
Null	Null	Null	Null	Null	Null				8.577041445	4/20/2011	708487.2692	3701624.57
Null	Null	Null	Null	Null	Null				3.332071657		708486.901	3701625.824
Null	Null	Null	Null	Null	Null				713.9405719		705442.0707	3707287.849
Null	Null	Null	Null	Null	Null				720.7190138	4/22/2011	705980.0981	3707087.069
Null	Null	Null	Null	Null	Null				699.9319828	4/22/2011	705743.0856	3707078.089
Null	Null	Null	Null	Null	Null				318.7045043	4/22/2011	705746.7212	3707123.706
Null	Null	Null	Null	Null	Null				364.55865	4/22/2011	707830.2284	3701741.658
Null	Null	Null	Null	Null	Null				222.2352219	4/22/2011	708252.1901	3701658.974
Null	Null	Null	Null	Null	Null				375.5861769	4/22/2011	708253.7605	3701748.065
Null	Null	Null	Null	Null	Null				116.2630838	5/6/2011	705245.2481	3707290.541
Null	Null	Null	Null	Null	Null				146.0612856	5/6/2011	705166.1139	3707248.621
Null	Null	Null	Null	Null	Null				131.9817999	5/6/2011	705171.6884	3707242.836
Null	Null	Null	Null	Null	Null				57.31035772		705177.8881	3707212.121
Null	Null	Null	Null	Null	Null				134.218845	5/6/2011	705169.0742	3707225.857
Null	Null	Null	Null	Null	Null				1297.559499	5/6/2011	705355.6538	3707226.695
Null	Null	Null	Null	Null	Null				363.5215668	5/6/2011	705402.7055	3707238.717
Null	Null	Null	Null	Null	Null				1233.996456		705431.0683	3707274.987
Null	Null	Null	Null	Null	Null				279.4467109	5/6/2011	705395.233	3707306.724
Null	Null	Null	Null	Null	Null				367.6150657	5/6/2011	705452.017	3707285.784
Null	Null	Null	Null	Null	Null				651.854147	5/6/2011	705417.1278	3707315.232
Null	Null	Null	Null	Null	Null				673.9224903	5/6/2011	705416.3479	3707355.294
Null	Null	Null	Null	Null	Null				270.5634986	5/6/2011	705492.1048	3707384.85
									209.1106145	5/7/2011	705163.3667	3706153.752
No	No	No	No	No	No			full extent of drainage not mapped to wesr	1007.831283	5/7/2011	704971.5252	3706268.686
Null	Null	Null	Null	Null	Null				113.5926233	5/7/2011	705011.1195	3706213.832
								full extent mapped	577.4407003	5/7/2011	705008.5607	3706203.136
Null	Null	Null	Null	Null	Null				67.9457387	5/7/2011	704982.9014	3706228.27
Null	Null	Null	Null	Null	Null				54.75035591	5/7/2011	704977.934	3706230.425
								full extent not mapped	614.3376642	5/7/2011	705015.8455	3706141.848
Null	Null	Null	Null	Null	Null				632.5752586		704964.6519	3706141.963
No	No	No	No	No	No			full extent not mapped	619.5951233	5/7/2011	705069.4645	3706080.379
Null	Null	Null	Null	Null	Null				58.55575455		705029.6703	3706095.174
Null	Null	Null	Null	Null	Null				107.8827409	5/7/2011	705040.6355	3706081.478
Null	Null	Null	Null	Null	Null				271.6381646	5/7/2011	705873.8882	3707302.583
Null	Null	Null	Null	Null	Null				324.9512336	5/7/2011	705853.7464	3707286.928
Null	Null	Null	Null	Null	Null				161.6456238	5/7/2011	705851.3133	3707276.663
Null	Null	Null	Null	Null	Null				920.906752	5/7/2011	705962.9493	3707226.871
Null	Null	Null	Null	Null	Null				700.5599682	5/7/2011	705962.9882	3707183.789
Null	Null	Null	Null	Null	Null				254.5347019	5/7/2011	705918.5836	3707194.674
No	No	No	No	No	No			full extent not mapped	1137.435554	5/7/2011	706096.1147	3706957.533

ATTACHMENT DR 76-3

FIELD SHEETS

JD Data Form - BSE Blythe

Date: 20 APR 2011 Grid # R5 + Q5 Page#

Observers: G. HOISINGTON / R. BAILEY

Transect # 12

Upstream photo # 537 + 538 (R. Bailey camera)

Downstream photo # 539 + 540

Width (ft)

0 to 10	
10 to 20	X
20 to 50	
50+	

→ only at channel center; total width of entire WoUS/WoS extends from Y1 to Y2 (a very large distance)

Depth (ft.) 2

Veg or Unveg (U or V) V

Dominant plant spp. (from Trimble drop-down) Ironwood, Acacia greggii, Hymenoclea salsola

Other plant spp. none

OHWM Indicators (Check all that apply)

Bed and bank	✓
Clear, natural line impressed on the bank	✓
Shelving or cut banks, exposed roots	✓
Scour	✓
Vegetation matted down, bent, or absent	✓
Destruction of terrestrial vegeatation	✓
Abrupt change in plant community	✓
Litter disturbed or washed away	✓
Presence of litter or debris	✓
Sediment deposition	✓
Sediment sorting	✓
Changes in the character of the soil	✓
Water staining	
Multiple observed or predicted flow events	✓

Notes:

TOB$_1$ is ≈ 40' above low flow channel + is incised ≈ 60% grade. TOB$_2$ has a much lower bank height, ≈ 5' above the low flow channel, because of the curve of the channel.

Within this transect, the high flow channel extends across the entire feature. Multiple low-flow channels occur throughout. The entire channel has evidence of flow with very little upland inclusions. Large debris deposits >3' in height occur throughout. Uplands ≈ 5% of transect, and these are flooded during high-flow events. The center point of the channel was arbitrarily chosen; there are many channels within the feature that could be the center channel.

No riparian vegetation extends beyond the TOB in the vicinity of the transect.

* For point type x=low flow, y=high flow, TOB=top of bank, r=riparian

JD Data Form - BSE Blythe

Date: 20 Apr 11 Grid # J5/K5 Page# 53/61

Observers: SADM Team B

Transect # 9

Upstream photo # _____

Downstream photo # _____

Width (ft)	C1	C2
0 to 10		
10 to 20		
20 to 50		
50+	X	X
Depth (ft.)	3 ft	3 ft
Veg or Unveg (U or V)	V	V

Channel 1

S → N

R1
TOB1
Y1
X1
X2
Y2
Y3
X3
X4 — C1
Y4
TOB2
R2

side 672
up 674
down 675

side 673
up 676
down 678

Channel 2

S → N

R1
TOB1
Y1
X1
X2
Y2
Y3
X3
X4
Y4
Y5
X5 - Y6
Y6
Y7
C2 — X7 - X8
Y8
Y9
TBO2
R2
X9 - X10
Y10

pic 5679
up 680
down 681

pic 684
up 682
down 683

up 685
down 686

pic 689
up 687
down 688

pic 690
up 691
down 692

Dominant plant spp. (from Trimble drop-down) OLTE, LATR, LYAN, PAFL PSSP, PSRT C1 BRTO

~~Other plant spp.~~ LATR, OLTE, LYAN, PSSP PAFL, PSRT, BRTO, ALGR C2

OHWM Indicators (Check all that apply)

	C1	C2
Bed and bank	X	X
Clear, natural line impressed on the bank	X	X
Shelving or cut banks, exposed roots	X	X
Scour	X	X
Vegetation matted down, bent, or absent		
Destruction of terrestrial vegeatation		
Abrupt change in plant community	X	X
Litter disturbed or washed away	X	X
Presence of litter or debris	X	X
Sediment deposition	X	X
Sediment sorting	X	X
Changes in the character of the soil	X	X
Water staining		
Multiple observed or predicted flow events	X	X

Notes:

C1 Sediment Sand → Gravel

C2 Sediment Sand → Gravel

* For point type x=low flow, y=high flow, TOB=top of bank, r=riparian

JD Data Form - BSE Blythe

Date: 20 Apr 11 Grid # J3/K3 Page# 51/59

Observers: SA/DM team B

Transect # 5

Upstream photo # _____

Downstream photo # _____

Width (ft)	
0 to 10	
10 to 20	
20 to 50	
50+	X

Depth (ft.) 5ft

Veg or Unveg (U or V) V

Dominant plant spp. (from Trimble drop-down) OLTE, PSSP, PSRI, HYSA

Other plant spp. Palo Verde

N to S
up 665
down 666
R1
TOB1
Y1
X1
X2
Y2
pic 5663

up 5667
down 5668
Y3
X3
X4
Y4
5664

up 5670
down 5671
Y5
X5
X6
Y6
TOB2
R2
5669

OHWM Indicators (Check all that apply)

Bed and bank	✓
Clear, natural line impressed on the bank	✓
Shelving or cut banks, exposed roots	✓
Scour	✓
Vegetation matted down, bent, or absent	
Destruction of terrestrial vegeatation	
Abrupt change in plant community	✓
Litter disturbed or washed away	
Presence of litter or debris	
Sediment deposition	✓
Sediment sorting	✓
Changes in the character of the soil	✓
Water staining	
Multiple observed or predicted flow events	X

Notes: Substrate - Sand / Gravel

* For point type x=low flow, y=high flow, TOB=top of bank, r=riparian

JD Data Form - BSE Blythe

Date: 04-21-11 Grid # K6; L6 Page# 52, 70

Observers: SH, CM

Transect # 7

Upstream photo # 106 - 108 | 116 - 118

Downstream photo # 109 - 111 | 119 - 121

Width (ft)

0 to 10	
10 to 20	
20 to 50	
50+	X

N. side

S. side

Depth (ft.) ~~5~~ ~~X~~ 1

Veg or Unveg (U or V) V

Dominant plant spp. (from Trimble drop-down) LATR, OLTE, AMDU, PSRI, PAFL, HYSA

Other plant spp.

OHWM Indicators (Check all that apply)

Bed and bank	X
Clear, natural line impressed on the bank	
Shelving or cut banks, exposed roots	X
Scour	X
Vegetation matted down, bent, or absent	
Destruction of terrestrial vegeatation	X
Abrupt change in plant community	X
Litter disturbed or washed away	X
Presence of litter or debris	
Sediment deposition	X
Sediment sorting	X
Changes in the character of the soil	
Water staining	
Multiple observed or predicted flow events	X

Notes:

- X_1 & Y_1 are same pt.
- X_3 & Y_3 are same pt.
- area between TOB_2 & TOB_3 is large braiding & pooling (over-flow area)
- ~~X_7 is only ~ 1 ft. wide~~
- X_{7-8} is only ~1 ft. wide
- X_{9-10} is ~5 ft. wide
- Braids throughout drainage

PICS 112 - 115

X ||||

Y ||||

TOB ||||

* For point type x=low flow, y=high flow, TOB=top of bank, r=riparian

JD Data Form - BSE Blythe

Date: 04-21-11 Grid # E6 Page# 16

Observers: SH, CM

Transect # 1

Upstream photo # 102, 103

Downstream photo # 104, 105

Width (ft)

0 to 10	X
10 to 20	
20 to 50	
50+	

Depth (ft.) < 1

Veg or Unveg (U or V) U

Dominant plant spp. (from Trimble drop-down) PSRI ; ENFA ; LATR

Other plant spp. PLOB; CR ; AMOV

OHWM Indicators (Check all that apply)

Bed and bank	X
Clear, natural line impressed on the bank	X
Shelving or cut banks, exposed roots	
Scour	
Vegetation matted down, bent, or absent	
Destruction of terrestrial vegeatation	
Abrupt change in plant community	
Litter disturbed or washed away	
Presence of litter or debris	
Sediment deposition	X
Sediment sorting	
Changes in the character of the soil	
Water staining	
Multiple observed or predicted flow events	

Notes:
- X_{13}, Y_{13}, + TOB_9 are same pt
- X_{14}, Y_{14}, + TOB_{10} are same pt

For point type x=low flow, y=high flow, TOB=top of bank, r=riparian

JD Data Form - BSE Blythe

Date: 04-21-11 Grid # E6 Page# 16

Observers: SH, CM

Transect # 1

Upstream photo # 93, 94, 95, 98, 99

Downstream photo # 96, 97, 100, 101

Width (ft)

0 to 10	
10 to 20	
20 to 50	X
50+	

Depth (ft.) 3

Veg or Unveg (U or V) V

Dominant plant spp. (from Trimble drop-down) OLTE; LATR; PLRI; PAFL, AMDU

Other plant spp. TEQUILLA sp

OHWM Indicators (Check all that apply)

Bed and bank	X
Clear, natural line impressed on the bank	X
Shelving or cut banks, exposed roots	X
Scour	X
Vegetation matted down, bent, or absent	
Destruction of terrestrial vegeatation	X
Abrupt change in plant community	X
Litter disturbed or washed away	X
Presence of litter or debris	
Sediment deposition	X
Sediment sorting	X
Changes in the character of the soil	
Water staining	
Multiple observed or predicted flow events	X

Notes:

- No R on N. side
- X_{11} & Y_{11} are same pt.
- X_{12} & Y_{12} are same pt.

* For point type x=low flow, y=high flow, TOB=top of bank, r=riparian

JD Data Form - BSE Blythe

Date: 4-21-11 Grid # E6 Page# 16

Observers: Sean Harris / Colleen Martin

Transect # 1

5H camera

Upstream photo # 76, 77, 81, 82

Downstream photo # 78, 79, 80, 83, 84 (N. to S.)

Width (ft)

0 to 10	
10 to 20	
20 to 50	
50+	X

Depth (ft.) 2

Veg or Unveg (U or V) V

Dominant plant spp. (from Trimble drop-down) OLTE, LATR, AMDU, PSRI; PAFL

Other plant spp. Croton, Tequilia

OHWM Indicators (Check all that apply)

Bed and bank	X
Clear, natural line impressed on the bank	X
Shelving or cut banks, exposed roots	X
Scour	X
Vegetation matted down, bent, or absent	
Destruction of terrestrial vegeatation	X
Abrupt change in plant community	X
Litter disturbed or washed away	X
Presence of litter or debris	
Sediment deposition	X
Sediment sorting	X
Changes in the character of the soil	
Water staining	
Multiple observed or predicted flow events	X

Notes:

X, ~~THT~~ ~~THT~~ ||||
Y, ~~THT~~ ~~THT~~ ||||
TOB, ~~THT~~ ~~THT~~
R, ||||

* For point type x=low flow, y=high flow, TOB=top of bank, r=riparian

JD Data Form - BSE Blythe

Date: 04-21-11 Grid # E6 Page# 16

Observers: SH, CM

Transect # 1

Upstream photo # 85, 86

Downstream photo # 87, 88

Width (ft)

0 to 10	X
10 to 20	
20 to 50	
50+	

Depth (ft.) < 1

Veg or Unveg (U or V) U

Dominant plant spp. (from Trimble drop-down) None

Other plant spp. None

OHWM Indicators (Check all that apply)

Bed and bank	
Clear, natural line impressed on the bank	
Shelving or cut banks, exposed roots	
Scour	
Vegetation matted down, bent, or absent	
Destruction of terrestrial vegeatation	
Abrupt change in plant community	
Litter disturbed or washed away	
Presence of litter or debris	
Sediment deposition	
Sediment sorting	
Changes in the character of the soil	
Water staining	
Multiple observed or predicted flow events	

Notes:

X_5 + X_6 are same pt.
~ 1 Ft. across
- had no R-zones

* For point type x=low flow, y=high flow, TOB=top of bank, r=riparian

JD Data Form - BSE Blythe

Date: 04-21-11 Grid # E6 Page# 16

Observers: SH, CM

Transect # 1

Upstream photo # ~~85~~, 89, 90

Downstream photo # 91, 92

Width (ft)

0 to 10	X
10 to 20	
20 to 50	
50+	

Depth (ft.) 1

Veg or Unveg (U or V) U

Dominant plant spp. (from Trimble drop-down)

Other plant spp.

OHWM Indicators (Check all that apply)

Bed and bank	
Clear, natural line impressed on the bank	
Shelving or cut banks, exposed roots	
Scour	
Vegetation matted down, bent, or absent	
Destruction of terrestrial vegeatation	
Abrupt change in plant community	
Litter disturbed or washed away	
Presence of litter or debris	
Sediment deposition	
Sediment sorting	
Changes in the character of the soil	
Water staining	
Multiple observed or predicted flow events	

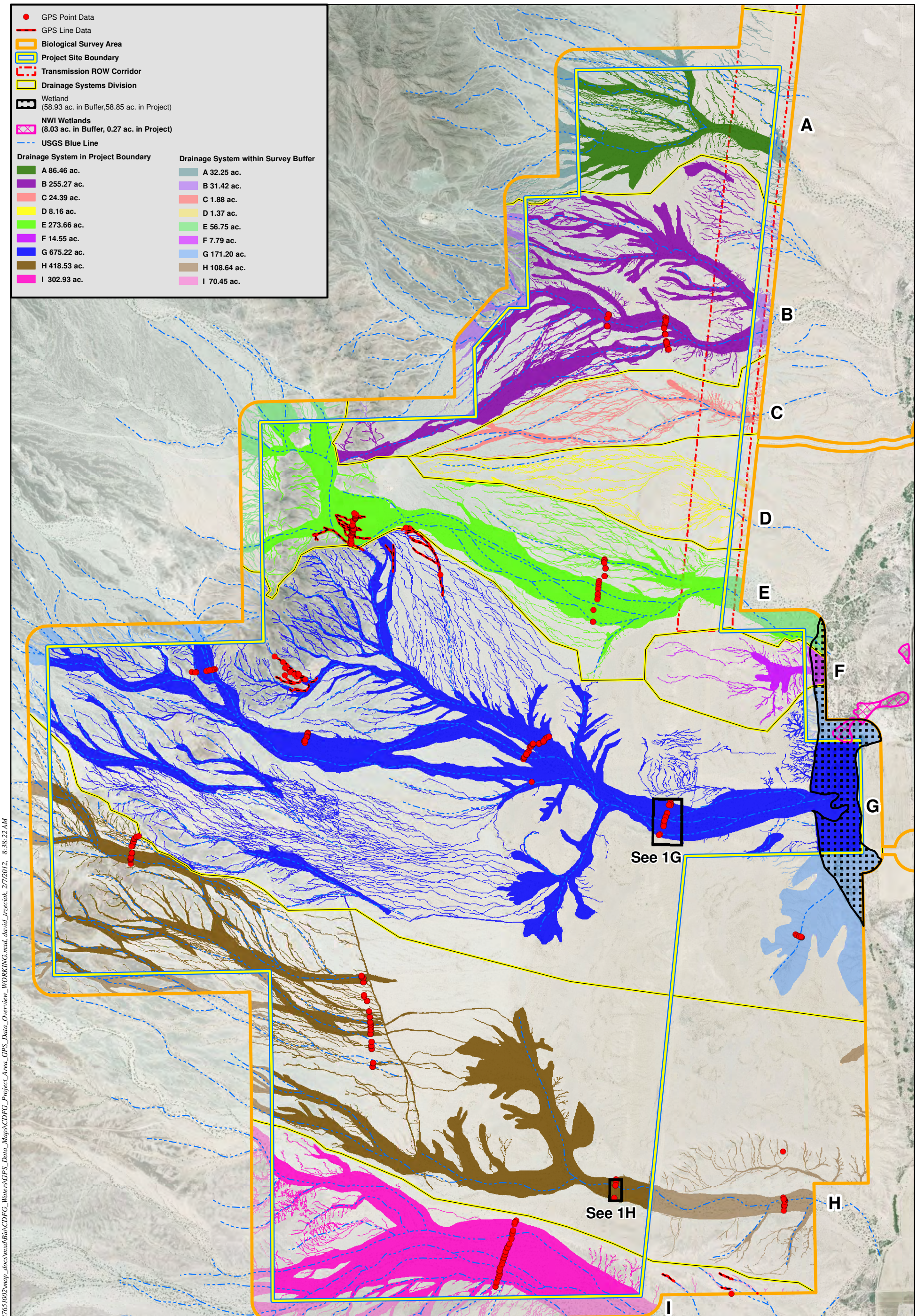
Notes:

- R No R-Zone on N. side
-

* For point type x=low flow, y=high flow, TOB=top of bank, r=riparian

ATTACHMENT DR 76-4

CDFG PROJECT AREA GPS DATA OVERVIEW



SOURCES:
GPS Data (URS, 2011)
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)
CDFG Waters, Drainage Systems Division,
Biological Survey Area (URS, 2011).

GPS DATA WITH CDFG POTENTIAL WATERS OF THE STATE
PROJECT AREA
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

URS

1100 0 1100 2200 Feet

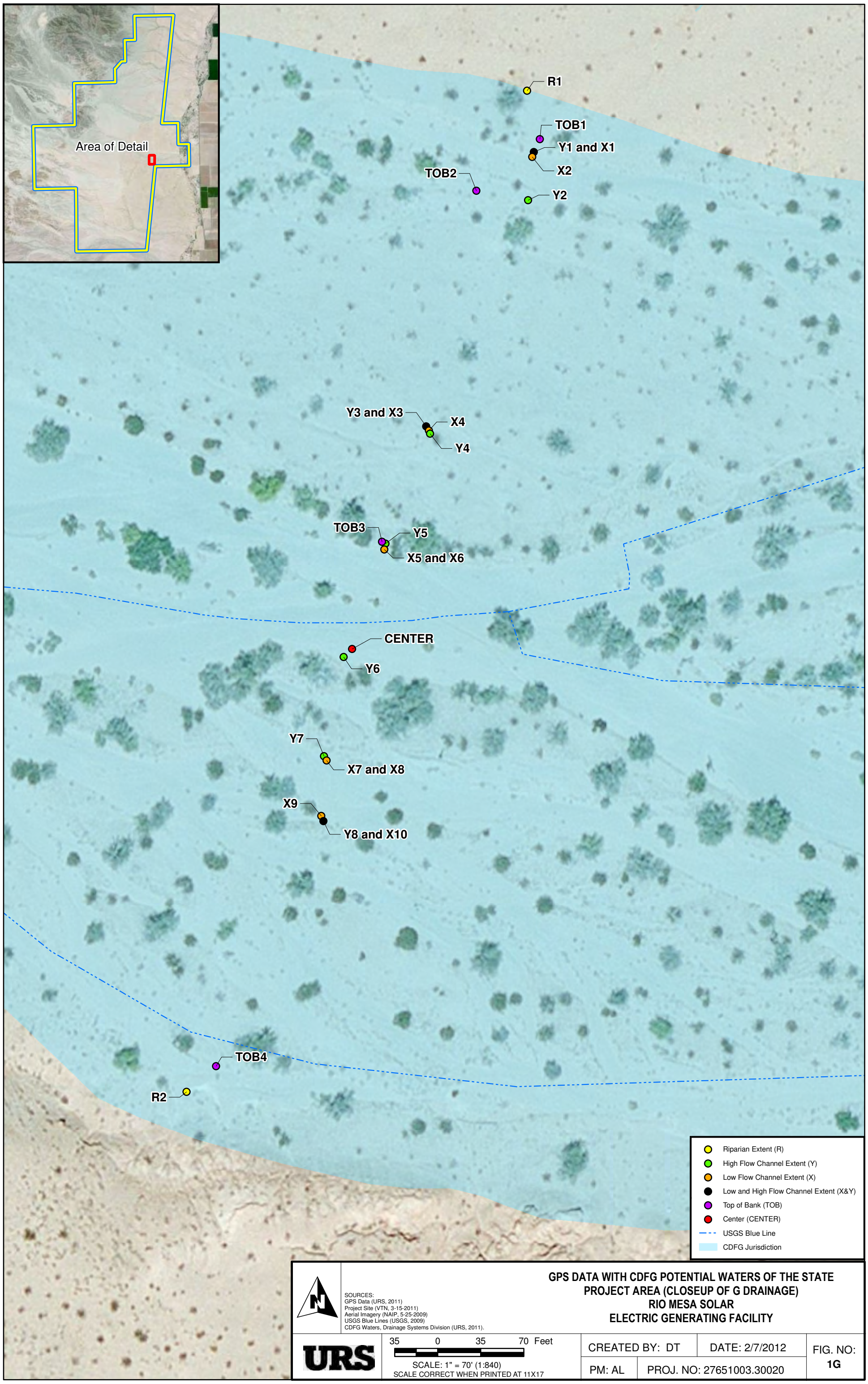
SCALE: 1" = 2,200' (1:26,400)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DT	DATE: 2/7/2012	FIG. NO: 1
PM: AL	PROJ. NO: 27651003.30020	

Path: \\S082-GIS-01\gis\projects\V57\27651002\map_docs\mxd\Bio\CDFG_Waters\GPS_Data_Maps\CDFG_Project_Area_GPS_Data_Overview_WORKING.mxd, david_rzeciak, 2/7/2012, 8:38:22 AM

ATTACHMENT DR 76-5

CDFG POINT DATA CLOSE-UP G DRAINAGE



SOURCES:
GPS Data (URS, 2011)
Project Site (VTN, 3-15-2011)
Aerial Imagery (NAIP, 5-25-2009)
USGS Blue Lines (USGS, 2009)
CDFG Waters, Drainage Systems Division (URS, 2011).

GPS DATA WITH CDFG POTENTIAL WATERS OF THE STATE
PROJECT AREA (CLOSEUP OF G DRAINAGE)
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

URS

35 0 35 70 Feet

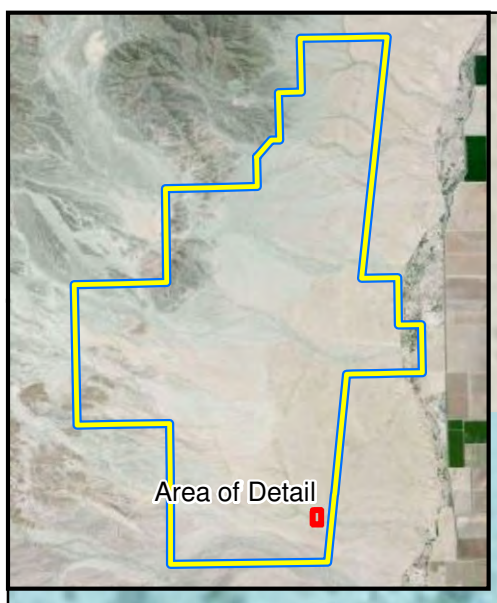
SCALE: 1" = 70' (1:840)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DT	DATE: 2/7/2012	FIG. NO: 1G
PM: AL	PROJ. NO: 27651003.30020	

Path: \\S082-GIS-01\gis\gis\projects\J577\27651002\mxd_docs\mxd\Bio\CDFG_Waters\GPS_Data_Maps\CDFG_Point_and_Line_Data_Closeup_G_DRAINAGE.mxd, david_rzeciak, 2/7/2012, 2:03:31 PM

ATTACHMENT DR 76-6

CDFG POINT DATA CLOSE-UP H DRAINAGE



R2

X2

TOB2

Y2

CENTER

X1

Y1

TOB1

R1

Riparian Extent (R)
High Flow Channel Extent (Y)
Low Flow Channel Extent (X)
Top of Bank (TOB)
Center (CENTER)
USGS Blue Line
CDFG Jurisdiction

SOURCES:
GPS Data (URS, 2011)
Project Site (VTN, 3-15-2011)
Aerial Imagery (NAIP, 5-25-2009)
USGS Blue Lines (USGS, 2009)
CDFG Waters, Drainage Systems Division (URS, 2011).

GPS DATA WITH CDFG POTENTIAL WATERS OF THE STATE
PROJECT AREA (CLOSEUP OF H DRAINAGE)
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

URS

25 0 25 50 Feet

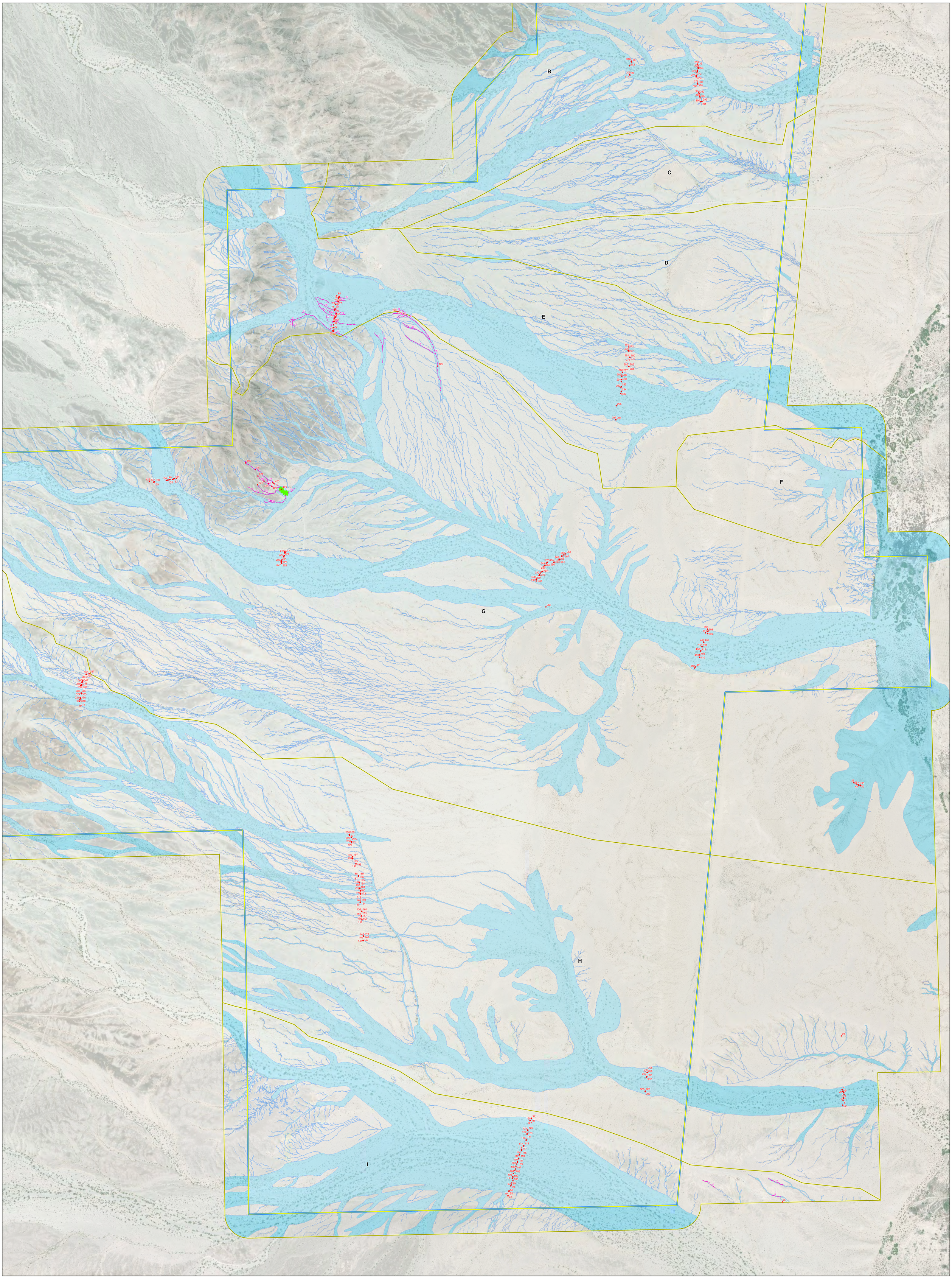
SCALE: 1" = 50' (1:600)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DT	DATE: 2/7/2012	FIG. NO: 1H
PM: AL	PROJ. NO: 27651003.30020	

Path: \\S082-GIS-01\gis\gis\projects\N\57\27651002\map_docs\mxd\Bio\CDFG_Waters\GPS_Data_Maps\CDFG_Point_and_Line_Data_Closeup_H_DRAINAGE.mxd, david_trzeciak, 2/7/2012, 8:53:51 AM

ATTACHMENT DR 76-7

JURISDICTIONAL DELINEATION GPS REFERENCE


B
C
D
E
F
G
H
I

ATTACHMENT DR 77-1

STORMWATER MANAGEMENT DRAWINGS

NA_FORMATS.CEL AC-FSTD_NA 07/17/08

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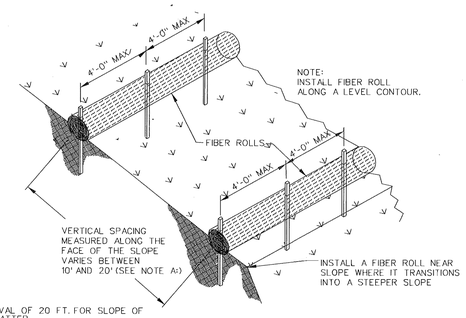
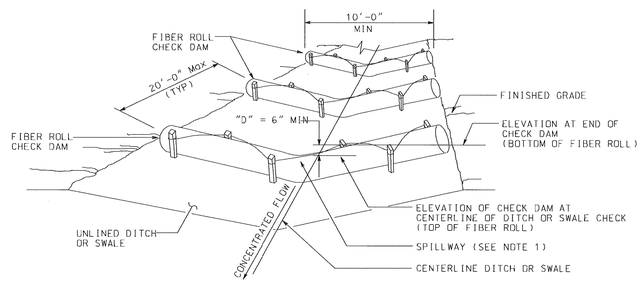


NOTE A:
MAXIMUM INTERVAL OF 20 FT. FOR SLOPE OF 4:1 (H:V) OR FLATTER.

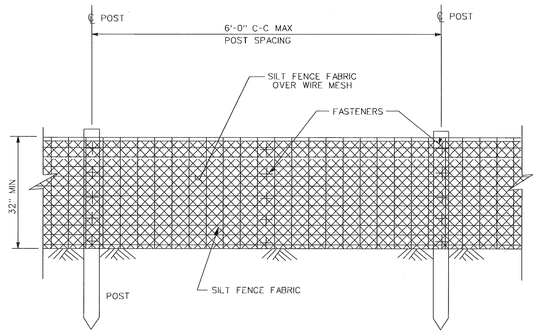
MAXIMUM INTERVAL OF 15 FT. FOR SLOPE BETWEEN 4:1 AND 2:1 (H:V)

MAXIMUM INTERVAL OF 10 FT. FOR SLOPE OF 2:1 (H:V) OR GREATER.

ISO VIEW - SLOPE



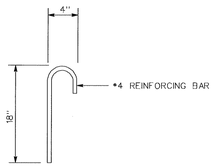
PERSPECTIVE
TEMPORARY CHECK DAM (TYPE 1)
(REF: CALTRANS DETAIL T57)



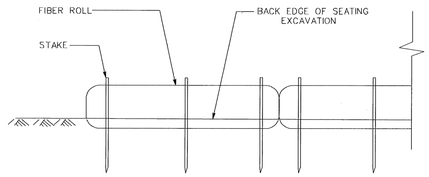
ELEVATION

NOTES FOR DETAIL 2:

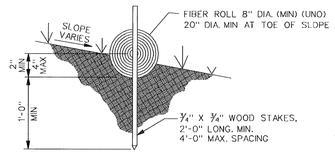
1. DO NOT USE IN THE FLOW CONCENTRATION AREA SUCH AS WASHES, DITCHES, DRAIN OUTLETS OR INLETS.
2. NOT FOR SLOPES GREATER THAN 4:1 (H:V).
3. MAXIMUM LENGTH OF SLOPE DRAINING TO ANY POINT ON SILT FENCE SHOULD BE 200 FEET OR LESS.
4. FILTER CLOTH SHOULD BE SPLICED TOGETHER ONLY AT POST WITH A MINIMUM 6" OVERLAP.
5. CHANGE IN BASE ELEVATION ALONG EACH REACH SHALL NOT EXCEED 1/3 HEIGHT OF THE BARRIER AND EACH REACH SHALL NOT EXCEED 500 FEET IN LENGTH.



ANCHOR



FRONT ELEVATION



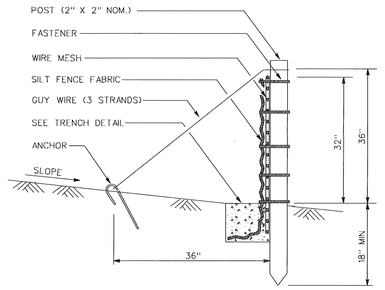
ENTRENCHMENT DETAIL
N.T.S.

TYPICAL FIBER ROLL INSTALLATION
(REF: CALTRANS DETAIL T66)

DETAIL 1

NOTES FOR DETAIL 1:

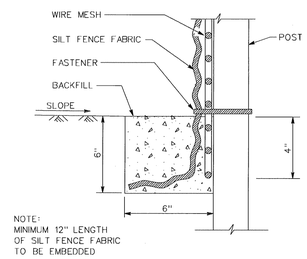
1. FIBER ROLLS SHALL BE USED ON SLOPES PRIOR TO ROCK COVER.
2. BIND ROLL AT EACH END AND EVERY 4'-0" ALONG LENGTH OF ROLL WITH JUTE TYPE TWINE.
3. TURN ENDS UP SLOPE TO PREVENT RUNOFF FROM GOING AROUND.
4. ROLLS SHALL BE OVERLAPPED, NOT ABUTTED.



SECTION

TEMPORARY REINFORCED SILT FENCE (TYPE 2)
(REF: CALTRANS DETAIL T60)
FOR LOCATIONS SEE PLAN DWG. (LATER)

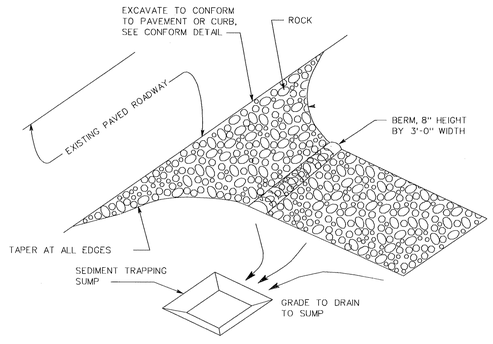
DETAIL 2



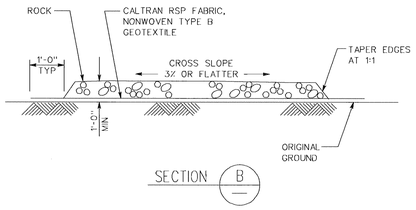
NOTE:
MINIMUM 12" LENGTH
OF SILT FENCE FABRIC
TO BE EMBEDDED

SECTION

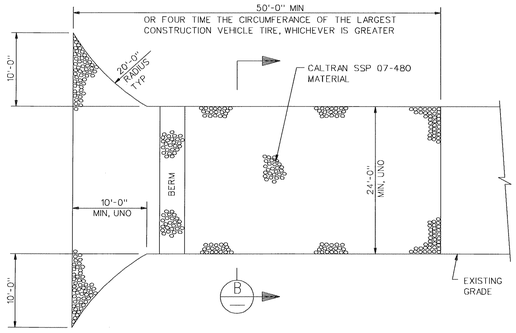
TRENCH DETAIL



ISO VIEW



SECTION B

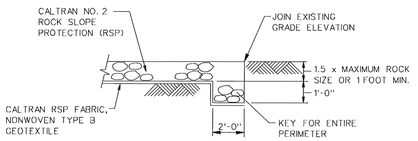


TYPICAL STABILIZED CONSTRUCTION ENTRANCE ROADWAY DETAILS
(REF: CALTRANS DETAIL T58)
FOR LOCATIONS SEE PLAN DWG. (LATER)

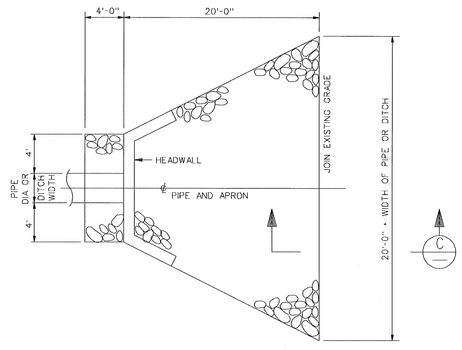
DETAIL 3

NOTES FOR DETAIL 3:

1. FILTER FABRIC SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE..
2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY SHALL BE REMOVED IMMEDIATELY.
3. WHEELS SHALL BE CLEANED AS REQUIRED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS OF WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE IN AN AREA STABILIZED WITH STONE AND THAT DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
4. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED.

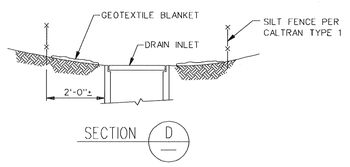


SECTION C

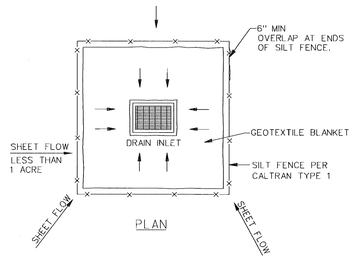


DRAINAGE OUTLET APRON DETAIL

DETAIL 4



SECTION D



PLAN

DRAIN INLET PROTECTION

DETAIL 5

NOTES FOR DETAIL 5:

1. FOR USE IN AREAS WHERE GRADING HAS BEEN COMPLETED AND FINAL SOIL STABILIZATION ARE PENDING.
2. NOT APPLICABLE IN PAVED AREAS.
3. NOT APPLICABLE FOR CONCENTRATED FLOWS.

GENERAL NOTE:

REFER TO CALTRANS 2006 STANDARD PLANS, STANDARD SPECIFICATIONS AND APPLICABLE AMENDMENTS AND SPECIAL PROVISIONS FOR DETAILS AND MAINTENANCE REQUIRMENTS, IF NOT SPECIFIED IN PROJECT DRAWINGS OR PROJECT SPECIFICATIONS.

NOTE:
DETAILS ON THIS DRAWING
TO BE APPLIED BASED ON
DETAILED DESIGN REQUIREMENTS
TO BE DETERMINED

PRELIMINARY
NOT FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CHK	DES. SUPV.	ENGR.	PROJ ENGR	APPR
A	8/15/11	ISSUED FOR REVIEW	LAP					

SCALE NTS | DATE 8/15/11 | DESIGNED | DRAWN LAP | CHIEF ENGR.

BrightSource

BECHTEL POWER CORP.
DEDICATED TO SAFETY EXCELLENCE - ZERO ACCIDENTS
FREDERICK, MARYLAND

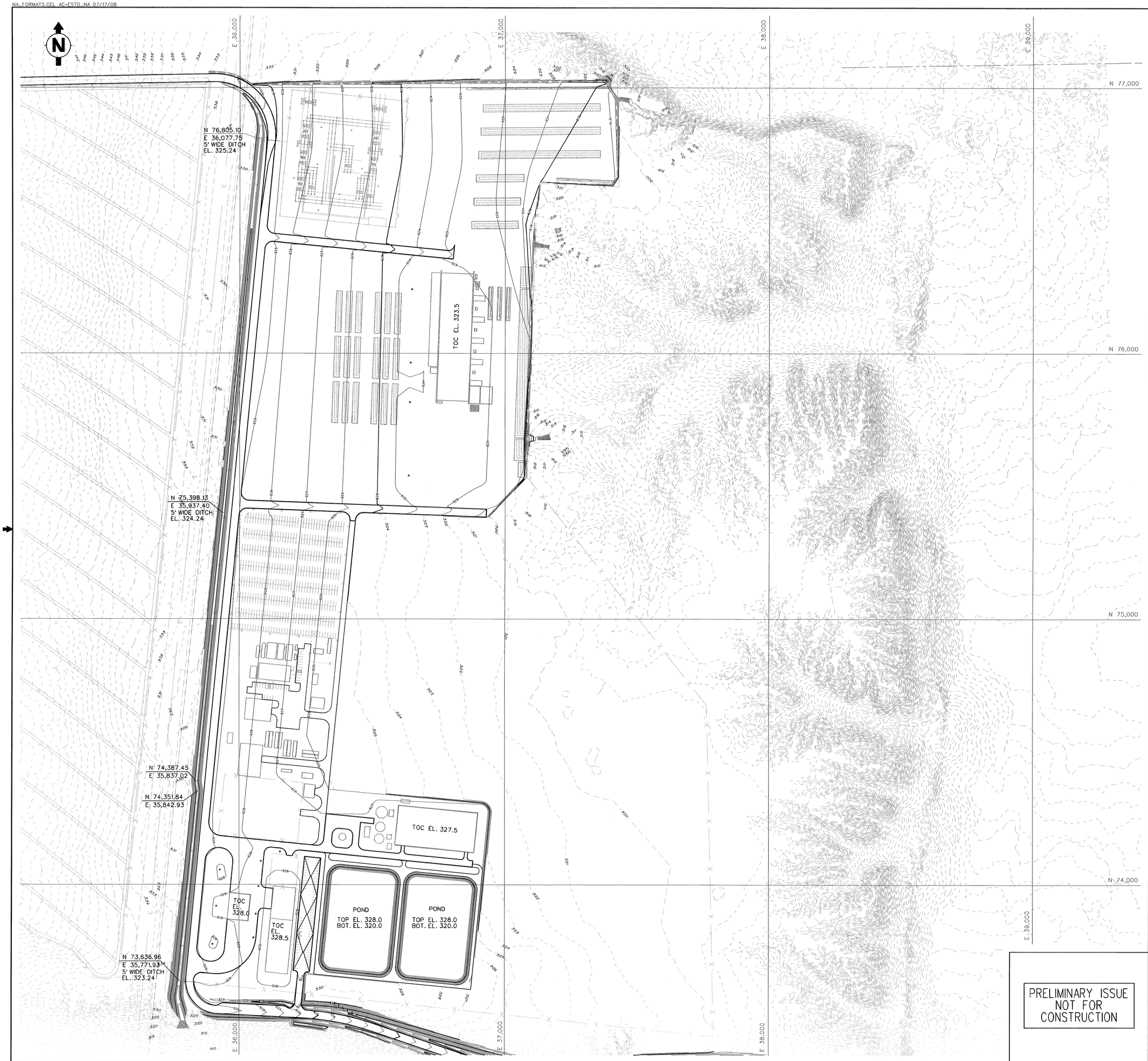
RIO MESA
SOLAR ELECTRIC GENERATING FACILITY

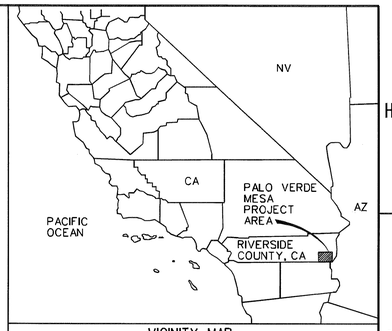
SITE WORK SHEET 2
EROSION & SEDIMENT CONTROL
SECTIONS & DETAILS

BSII (Ltd.)	OWNER DRAWING NO.	
	TBD	
BECHTEL	JOB NO. 25670	DRAWING NO. 000-C0-0090-00002 REV. A

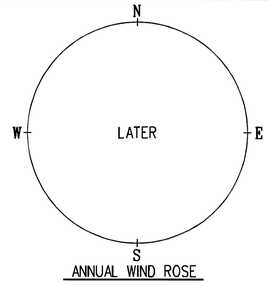
CALTRAN NO. 2

NA_FORMATS.CEL AC-ESTD_NA 07/17/08





VICINITY MAP



ANNUAL WIND ROSE

NOTES:

1. FOR COORDINATE SYSTEM, COORDINATES OF PROJECT BOUNDARY & VERTICAL DATUM, SEE SITE PLAN DRAWING 000-C2-0000-00001.
2. FOR STANDARD FENCING TYPES, DETAILS AND NOTES, SEE DWG. 000-C0-0090-00003 & 000-C0-0090-00006.
3. FOR GROUNDING DETAILS, SEE BECHTEL ENGINEERING DESIGN STANDARD FOR GROUNDING NOTES, SYMBOLS AND DETAILS NO. 000-EGJ-0000-00001.
4. ALL GATES WITH AN OPENING 8' OR LARGER SHALL BE DOUBLE SWING GATES.
5. SEE DRAWING NOS. 000-EG-0000-00001 AND 000-EG-0000-00002 FOR CONNECTION DETAILS BETWEEN FENCING AND THE ELECTRICAL GROUNDING SYSTEM.
6. THE COORDINATES SHOWN ON THIS DRAWING ARE BASED ON A LOCAL COORDINATE GRID REFERENCING THE CENTER OF POINT 660 AS 30,000 E, 70,000 N IN THE CALIFORNIA VI STATE PLANE COORDINATE SYSTEM (NAD 83, FEET).

A. HORIZONTAL DATUM:
NORTH AMERICAN DATUM 1983

B. UNIT OF MEASUREMENT
U.S. SURVEY FEET

C. GRID ORIGIN:
BASED ON THE CENTER OF POINT 660:
PLANT NORTHING: 70,000.0000 FEET
PLANT EASTING: 30,000.0000 FEET
STATE PLANE, CA VI NORTHING: 2,113,820.697 FEET
STATE PLANE, CA VI EASTING: 7,009,888.916 FEET
LATITUDE: 33° 27' 32.640" NORTH
LONGITUDE: 114° 46' 49.220" WEST

D. GRID PARAMETERS:
MODIFIED FALSE NORTHING: -418222.24933334 FEET
MODIFIED FALSE EASTING: -403404.03033334 FEET
CENTRAL MERIDIAN AT 116° 15' 0" WEST
CENTRAL MERIDIAN OF STATE PLANE, CA VI (FIPS 0406)

7. FOR SECTIONS & DETAILS, SEE DWG. (LATER)
8. ALL EARTHWORK SHALL BE IN ACCORDANCE WITH SPECIFICATION 25670-000-3PS-CE01-00001.
8. OIL/WATER SEPARATOR SHALL BE (LATER).
9. FOR STORM DRAIN SECTIONS & DETAILS, SEE DWG. (LATER).

LEGEND:

PROJECT BOUNDARY

0 60 120 240 360
1" = 120'

NO.	DATE	REVISIONS	BY	CHK	DES. SUPV.	ENGR	PROJ ENGR	APPR
A	26 OCT 11	ISSUED FOR REVIEW	LAP					

SCALE | DATE | DESIGNED | DRAWN | CHIEF ENGR.

BrightSource

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FREDERICK, MARYLAND

RIO MESA SOLAR ELECTRIC GENERATING FACILITY

COMMON AREA ROUGH GRADING PLAN

PRELIMINARY ISSUE NOT FOR CONSTRUCTION

BSII (Ltd.)	OWNER DRAWING NO.
	TBD

JOB NO.	DRAWING NO.	REV.
25670	009-CG-0010-00001	A

34"X44" E SIZE

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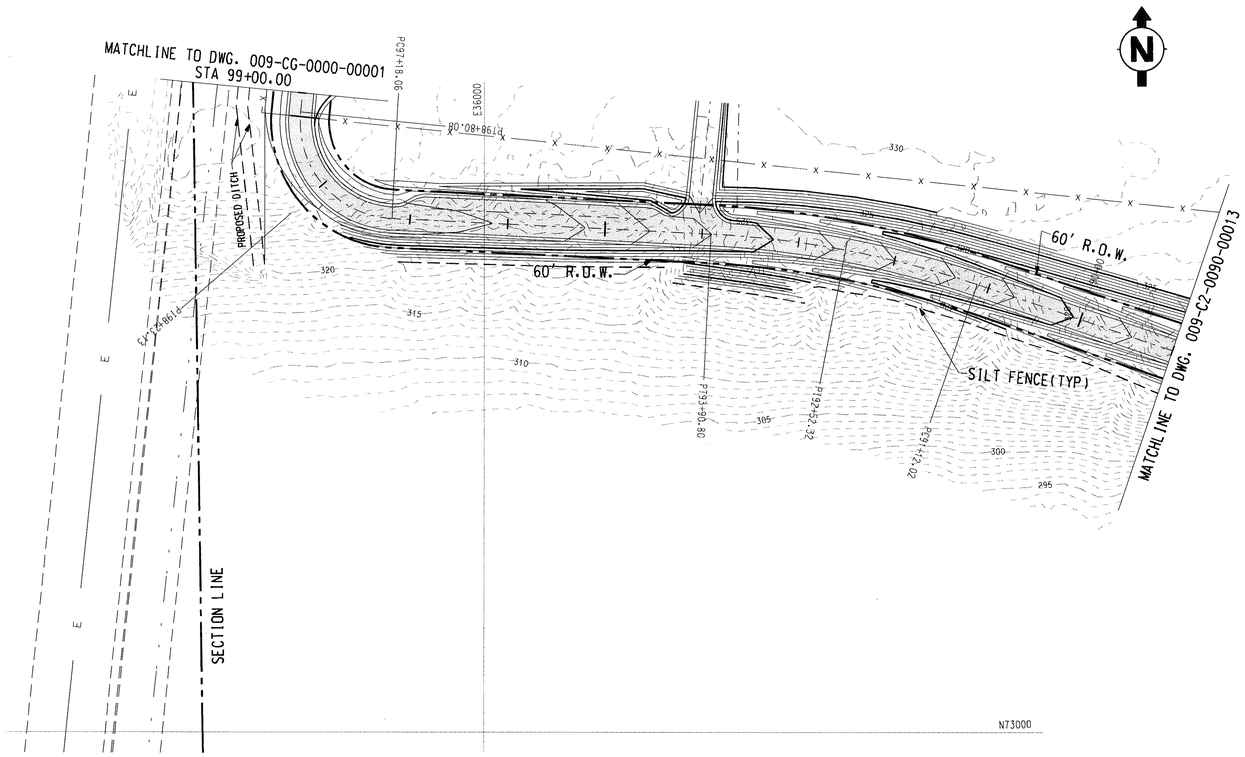
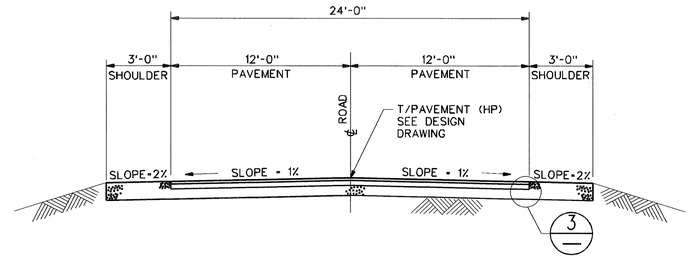
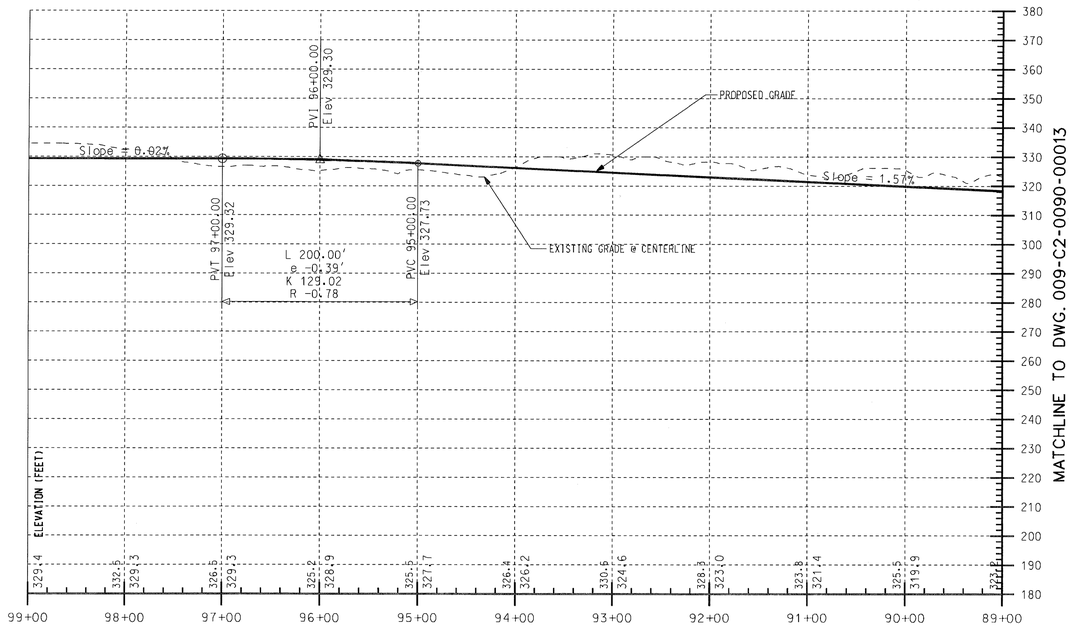


MAIN ACCESS ROAD CENTERLINE
PLAN VIEW
SCALE 1"= 60'



MAIN ROAD, SHARED ROAD & COMMON AREA ENTRANCE ROADS

DETAIL 1



MAIN ACCESS ROAD CENTERLINE PROFILE STA 89+00 TO 99+00

HORIZONTAL SCALE 1"= 60'
VERTICAL SCALE 1"= 30'

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CHK	DES SUPV.	ENGR.	PROJ ENGR	APPR
A	2/20/11	ISSUED FOR REVIEW	JAM					

SCALE | DATE | DESIGNED | DRAWN | CHIEF ENGR.

BrightSource

BECHTEL POWER CORP.
DEDICATED TO SAFETY EXCELLENCE - ZERO ACCIDENTS
FREDERICK, MARYLAND

RIO MESA
SOLAR ELECTRIC GENERATING FACILITY

MAIN ACCESS ROAD
34TH AVE. ENTRANCE
STA 89+00 TO STA 99+00

BSII (Ltd.)

OWNER DRAWING NO.
TBD

JOB NO.	DRAWING NO.	REV.
25670	009-C2-0090-00014	A

34"X44"E SIZE
PSC=

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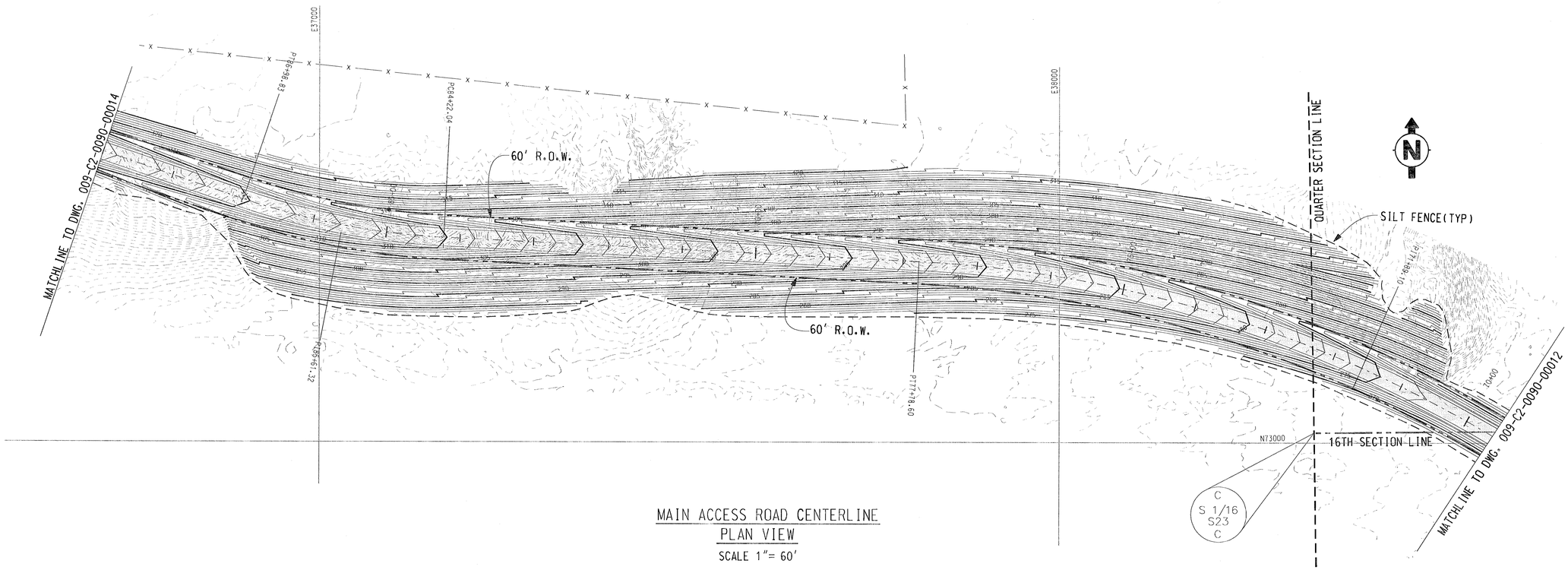
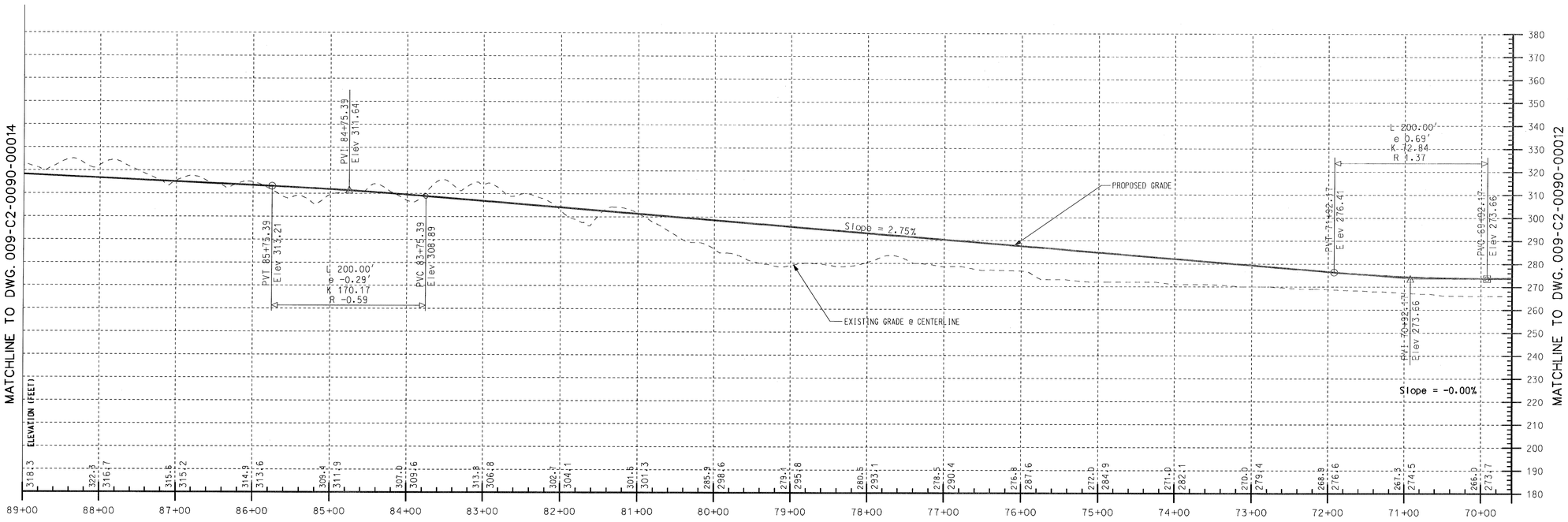
NA_FORMATS.CEL AC-ESTD_NA 07/17/08



MAIN ACCESS ROAD CENTERLINE
PLAN VIEW
SCALE 1"= 60'



MAIN ACCESS ROAD CENTERLINE PROFILE STA 69+60 TO 89+00

HORIZONTAL SCALE 1"= 60'
VERTICAL SCALE 1"= 30'

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CHK	DES SUPV.	ENGR.	PROJ ENGR	APPR
A	26 OCT	ISSUED FOR REVIEW	JAM					

SCALE | DATE | DESIGNED | DRAWN | CHIEF ENGR.

BrightSource

BECHTEL POWER CORP.
DEDICATED TO SAFETY EXCELLENCE - ZERO ACCIDENTS
FREDERICK, MARYLAND

RIO MESA
SOLAR ELECTRIC GENERATING FACILITY

MAIN ACCESS ROAD
34TH AVE. ENTRANCE
STA 69+60 TO STA 89+00

BSII (Ltd.)

OWNER DRAWING NO.		
TBD		
JOB NO.	DRAWING NO.	REV.
25670	009-C2-0090-00013	A

34"X44"E SIZE

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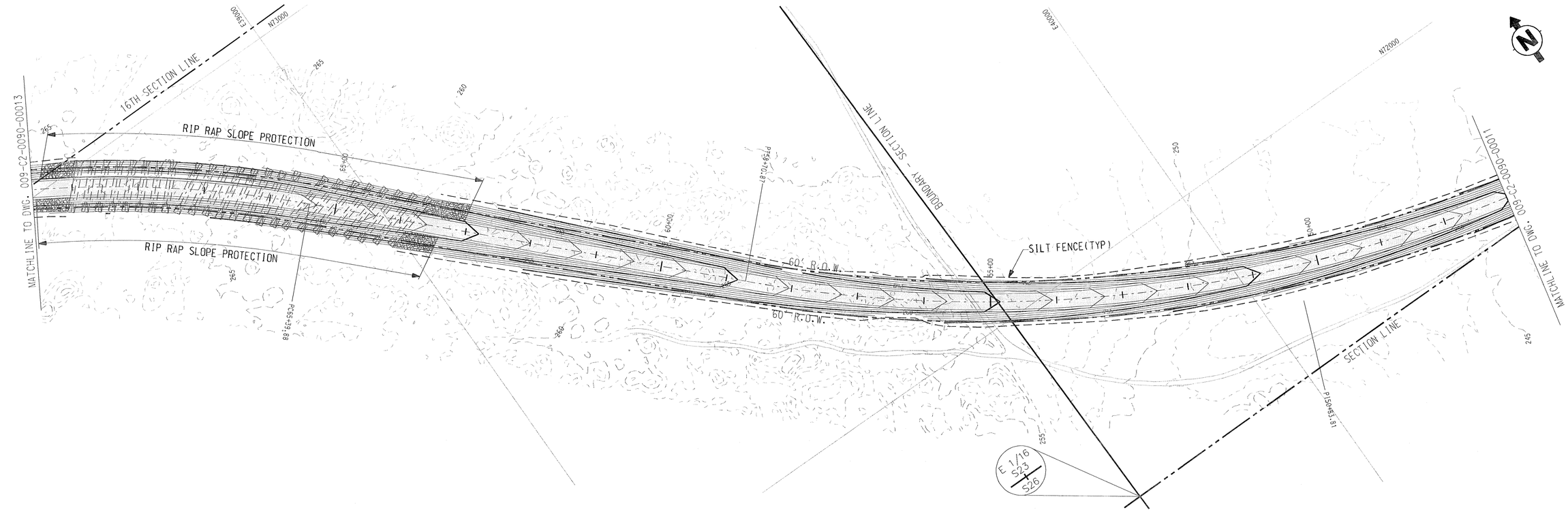
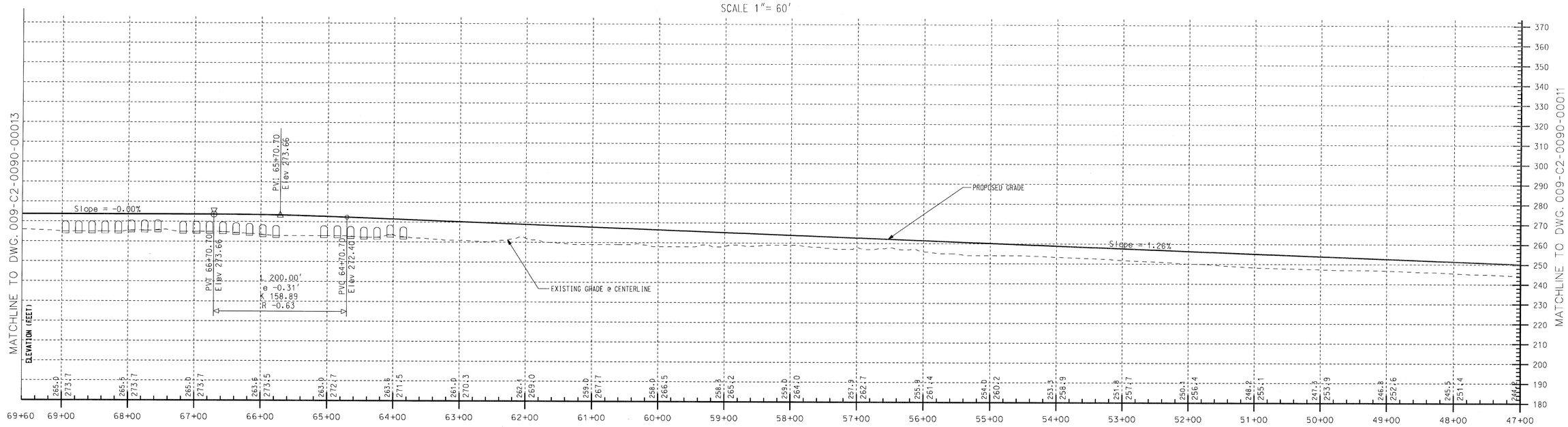
NA_FORMATS.CEL AC-ESTD_NA 07/17/08



MAIN ACCESS ROAD CENTERLINE
PLAN VIEW
SCALE 1"= 60'



MAIN ACCESS ROAD CENTERLINE PROFILE STA 47+00 TO 69+60
HORIZONTAL SCALE 1"= 60'
VERTICAL SCALE 1"= 30'

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CHK	DES SUPV.	ENGR.	PROJ ENGR	APPR
A	26/6/11	ISSUED FOR REVIEW	JAM					

SCALE | DATE | DESIGNED | DRAWN | CHIEF ENGR.

BrightSource

BECHTEL POWER CORP.
DEDICATED TO SAFETY EXCELLENCE - ZERO ACCIDENTS
FREDERICK, MARYLAND

RIO MESA
SOLAR ELECTRIC GENERATING FACILITY

MAIN ACCESS ROAD
34TH AVE. ENTRANCE
STA 47+00 TO STA 69+60

BSII (Ltd.)

OWNER DRAWING NO.
TBD

JOB NO.	DRAWING NO.	REV
25670	009-C2-0090-00012	A

34"X44"E SIZE

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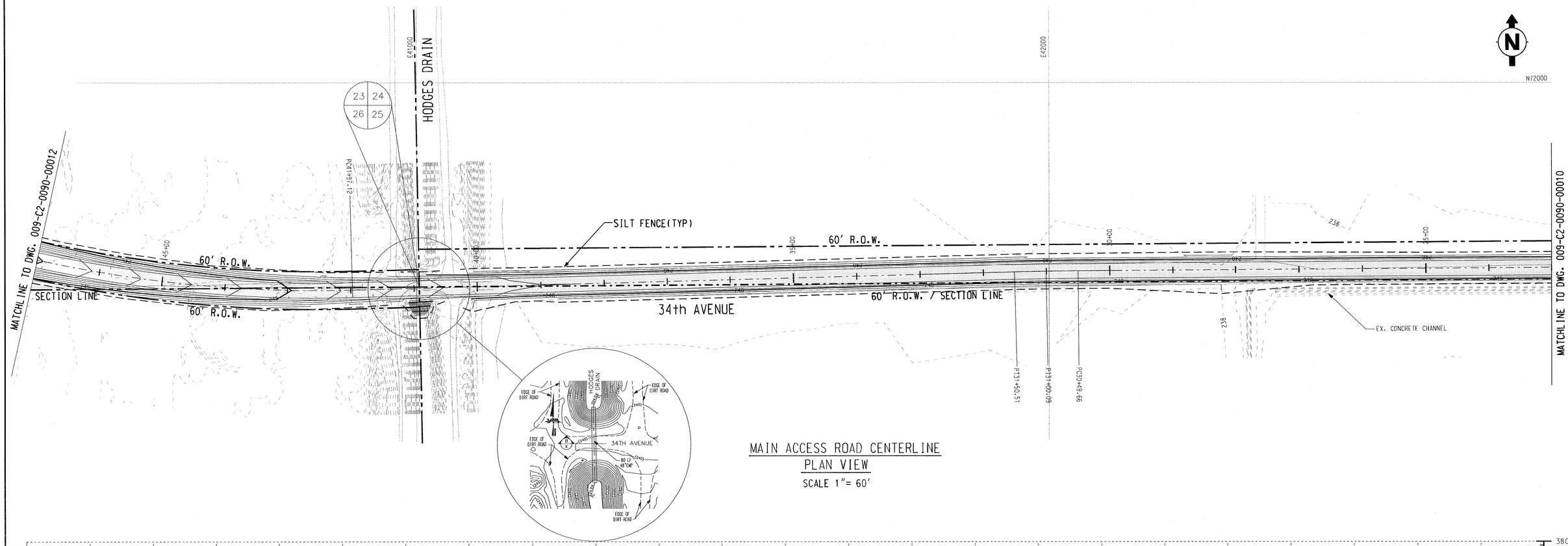
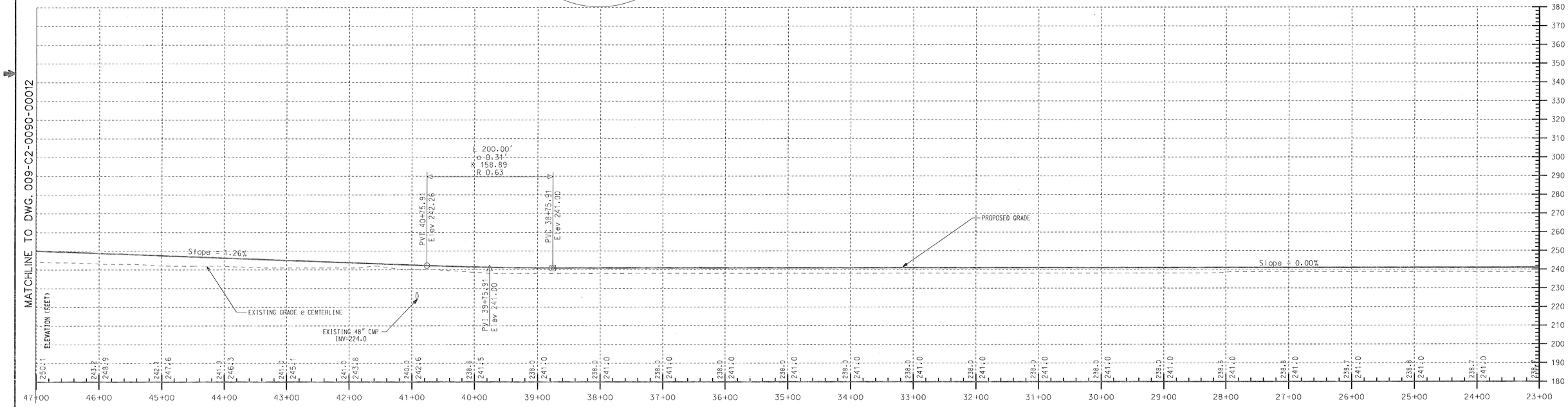
NA_FORMATS.CEL AC-ESTD_NA 07/17/08



MAIN ACCESS ROAD CENTERLINE
PLAN VIEW
SCALE 1"= 60'


MATCHLINE TO DWG. 009-C2-0090-00012
MATCHLINE TO DWG. 009-C2-0090-00010
ELEVATION (FEET)
L 200.00'
Δ 0.31°
K 158.89
R 0.63
PVT 40+75.91
Elev 242.26
PVC 38+75.91
Elev 241.00
PVI 39+75.91
Elev 241.00
Slope = 1.26%
Slope = 0.00%
PROPOSED GRADE
EXISTING GRADE @ CENTERLINE
EXISTING 48" CMP
INV=224.0
380
370
360
350
340
330
320
310
300
290
280
270
260
250
240
230
220
210
200
190
180
250.1 243.2 243.9 242.1 247.6 241.9 246.3 241.0 245.1 241.0 243.8 240.0 242.6 238.6 241.5 238.0 241.0 238.0 241.0 238.0 241.0

NA_FORMATS.CEL AC-ESTD_NA 07/17/08

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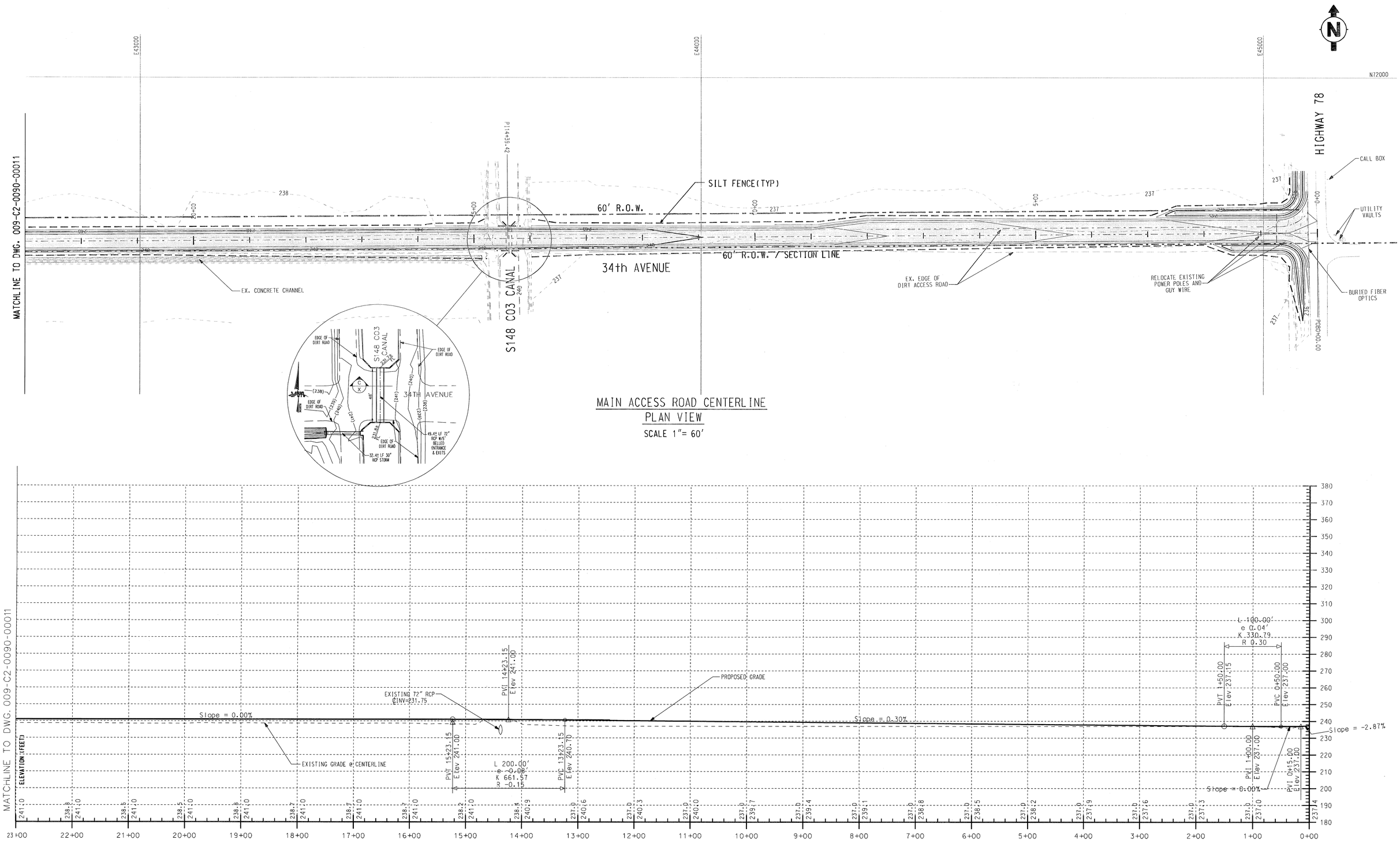

MAIN ACCESS ROAD CENTERLINE
PLAN VIEW
SCALE 1"= 60'

MAIN ACCESS ROAD CENTERLINE PROFILE STA 0+00 TO 23+00
HORIZONTAL SCALE 1"= 60'
VERTICAL SCALE 1"= 30'

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CHK	DES SUPV.	ENGR.	PROJ ENGR	APPR
1	8/5/11	ISSUED FOR REVIEW	JAM					

SCALE | DATE | DESIGNED | DRAWN | CHIEF ENGR.

BrightSource

BECHTEL POWER CORP.
DEDICATED TO SAFETY EXCELLENCE - ZERO ACCIDENTS
FREDERICK, MARYLAND

RIO MESA
SOLAR ELECTRIC GENERATING FACILITY

MAIN ACCESS ROAD
34TH AVE. ENTRANCE
STA 0+00 TO STA 23+00

BSII (Ltd.)	OWNER DRAWING NO.	
	TBD	
BECHTEL	JOB NO. 25670	DRAWING NO. 009-C2-0090-00010	REV. A

34"X44" E SIZE
PSC-

NA_FORMATS.CEL AC-ESTD_NA 07/17/08

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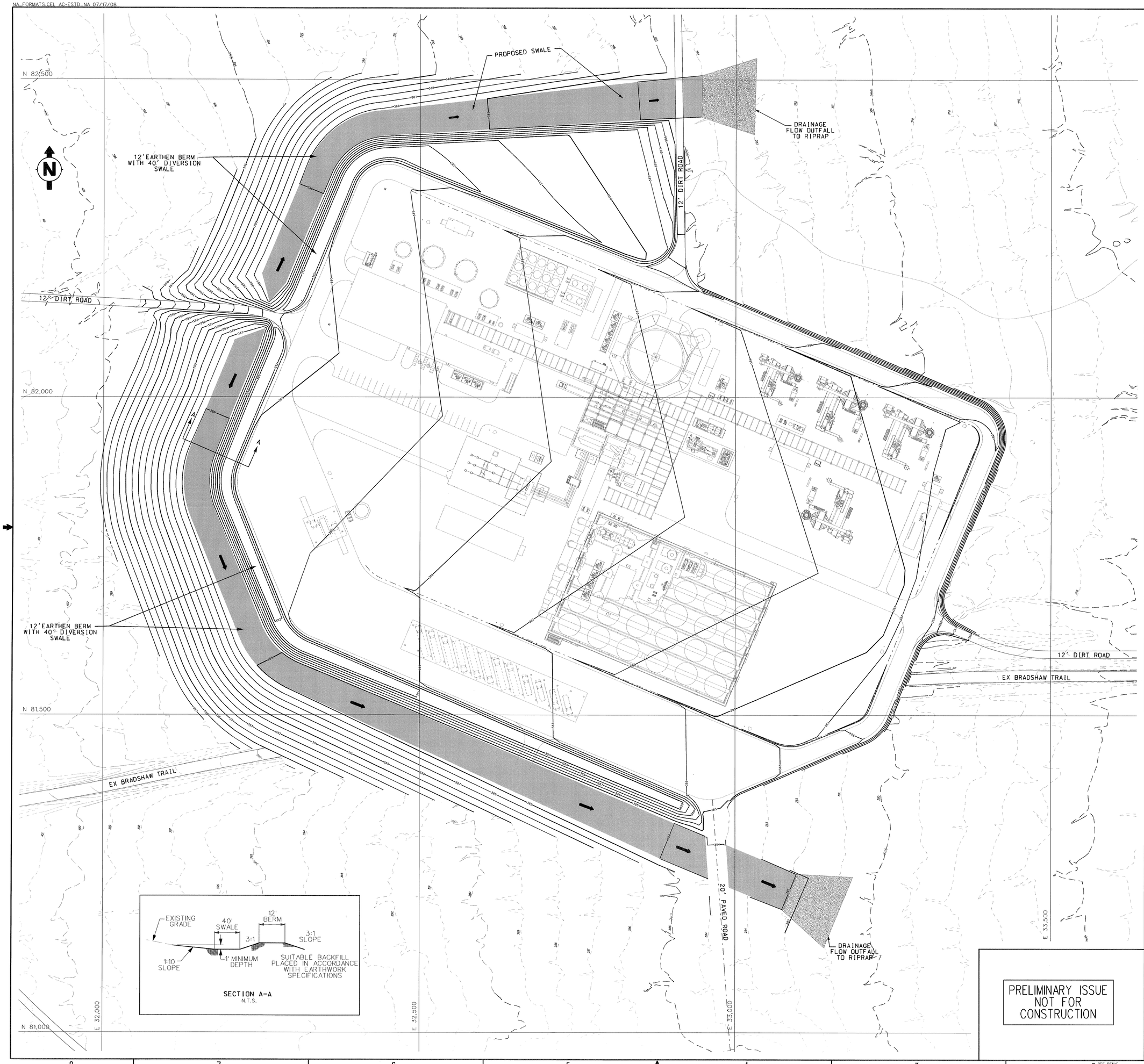
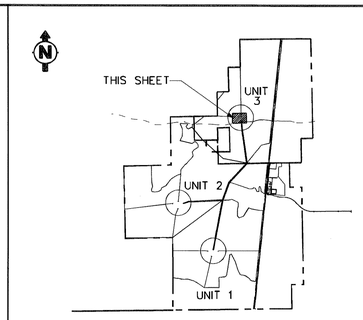
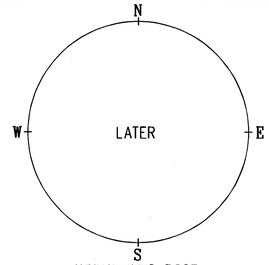




VICINITY MAP



ANNUAL WIND ROSE

NOTES:

1. FOR COORDINATE SYSTEM, COORDINATES OF PROJECT BOUNDARY & VERTICAL DATUM, SEE SITE PLAN DRAWING 000-C2-0000-00001.
2. FOR STANDARD FENCING TYPES, DETAILS AND NOTES, SEE DWG. 000-C0-0090-00003 & 000-C0-0090-00006.
3. FOR GROUNDING DETAILS, SEE BECHTEL ENGINEERING DESIGN STANDARD FOR GROUNDING NOTES, SYMBOLS AND DETAILS NO. 000-EGJ-0000-00001.
4. ALL GATES WITH AN OPENING 8' OR LARGER SHALL BE DOUBLE SWING GATES.
5. SEE DRAWING NOS. 000-EG-0000-00001 AND 000-EG-0000-00002 FOR CONNECTION DETAILS BETWEEN FENCING AND THE ELECTRICAL GROUNDING SYSTEM.
6. THE COORDINATES SHOWN ON THIS DRAWING ARE BASED ON A LOCAL COORDINATE GRID REFERENCING THE CENTER OF POINT 660 AS 30,000 E, 70,000 N IN THE CALIFORNIA VISTATE PLANE COORDINATE SYSTEM (NAD 83, FEET).

A. HORIZONTAL DATUM:
NORTH AMERICAN DATUM 1983

B. UNIT OF MEASUREMENT
U.S. SURVEY FEET

C. GRID ORIGIN:
BASED ON THE CENTER OF POINT 660:
PLANT NORTHING: 70,000.0000 FEET
PLANT EASTING: 30,000.0000 FEET
STATE PLANE, CA VINORTHING: 2,113,820.697 FEET
STATE PLANE, CA VIEASTING: 7,009,888.916 FEET
LATITUDE: 33° 27' 32.640" NORTH
LONGITUDE: 114° 46' 49.220" WEST

D. GRID PARAMETERS:
MODIFIED FALSE NORTHING: -418222.24933334 FEET
MODIFIED FALSE EASTING: -403404.03033334 FEET
CENTRAL MERIDIAN AT 116° 15'0" WEST
CENTRAL MERIDIAN OF STATE PLANE, CA VI (FIPS 0406)

7. FOR SECTIONS & DETAILS, SEE DWG. (LATER)
8. ALL EARTHWORK SHALL BE IN ACCORDANCE WITH SPECIFICATION 25670-000-3PS-CE01-00001.
8. OIL/WATER SEPARATOR SHALL BE (LATER).
9. FOR STORM DRAIN SECTIONS & DETAILS, SEE DWG. (LATER).

LEGEND:

PROJECT BOUNDARY

WATER FLOW

0 50 100 150
1" = 50'

PRELIMINARY ISSUE NOT FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CHK	DES. SUPV.	ENGR	PROJ ENGR	APPR
A	7/17/08	ISSUED FOR REVIEW	LAP		-			

SCALE | DATE | DESIGNED | DRAWN | CHIEF ENGR.

BrightSource

BECHTEL POWER CORP.
DEDICATED TO SAFETY EXCELLENCE - ZERO ACCIDENTS
FREDERICK, MARYLAND

RIO MESA SOLAR ELECTRIC GENERATING FACILITY

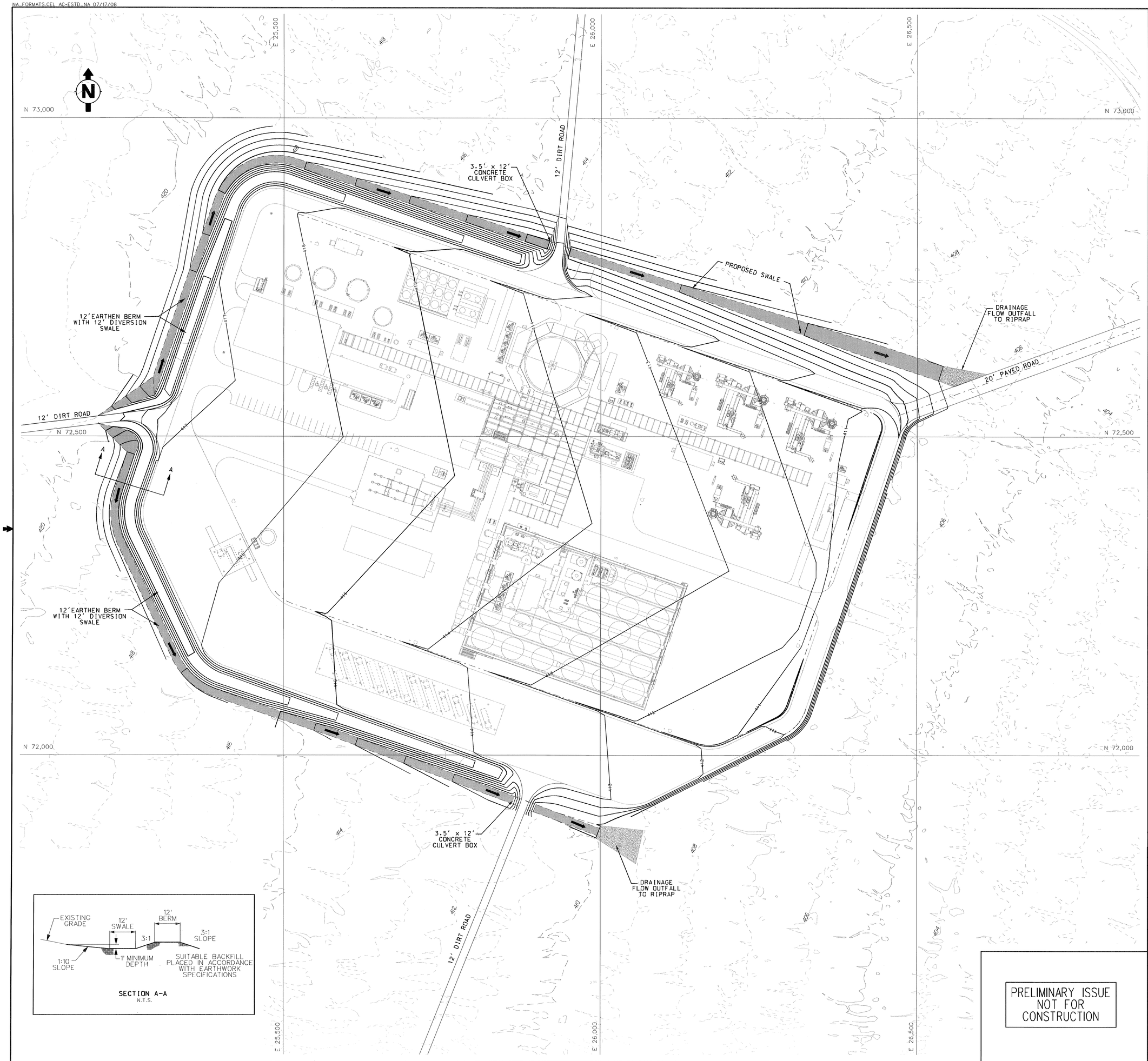
UNIT 3 ROUGH GRADING AND DRAINAGE PLAN

	OWNER DRAWING NO.		
BSII (L.td.)	TBD		
BECHTEL	JOB NO.	DRAWING NO.	REV.
	25670	003-CG-0010-00001	A

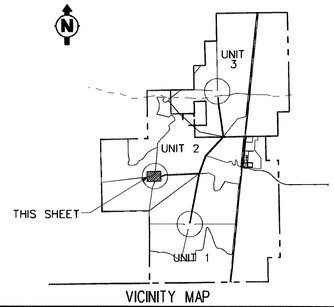
34"X44" E SIZE
PSC=

8 7 6 5 4 3 2 1

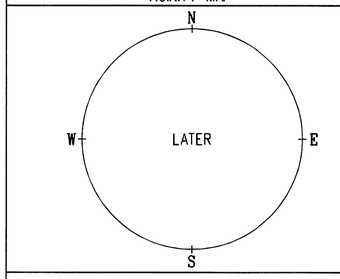
NA_FORMATS.CEL AC-ESTD_NA 07/17/08



SECTION A-A
N.T.S.



VICINITY MAP



ANNUAL WIND ROSE

NOTES:

1. FOR COORDINATE SYSTEM, COORDINATES OF PROJECT BOUNDARY & VERTICAL DATUM, SEE SITE PLAN DRAWING 000-C2-0000-00001.
2. FOR STANDARD FENCING TYPES, DETAILS AND NOTES, SEE DWG. 000-C0-0090-00003 & 000-C0-0090-00006.
3. FOR GROUNDING DETAILS, SEE BECHTEL ENGINEERING DESIGN STANDARD FOR GROUNDING NOTES, SYMBOLS AND DETAILS NO. 000-EGJ-0000-00001.
4. ALL GATES WITH AN OPENING 8' OR LARGER SHALL BE DOUBLE SWING GATES.
5. SEE DRAWING NOS. 000-EG-0000-00001 AND 000-EG-0000-00002 FOR CONNECTION DETAILS BETWEEN FENCING AND THE ELECTRICAL GROUNDING SYSTEM.
6. THE COORDINATES SHOWN ON THIS DRAWING ARE BASED ON A LOCAL COORDINATE GRID REFERENCING THE CENTER OF POINT 660 AS 30,000 E, 70,000 N IN THE CALIFORNIA VI STATE PLANE COORDINATE SYSTEM (NAD 83, FEET).

A. HORIZONTAL DATUM:
NORTH AMERICAN DATUM 1983

B. UNIT OF MEASUREMENT
U.S. SURVEY FEET

C. GRID ORIGIN:
BASED ON THE CENTER OF POINT 660:
PLANT NORTHING: 70,000.0000 FEET
PLANT EASTING: 30,000.0000 FEET
STATE PLANE, CA VINORTHING: 2,113,820.697 FEET
STATE PLANE, CA VIEASTING: 7,009,888.916 FEET
LATITUDE: 33° 27' 32.640" NORTH
LONGITUDE: 114° 46' 49.220" WEST

D. GRID PARAMETERS:
MODIFIED FALSE NORTHING: -418222.24933334 FEET
MODIFIED FALSE EASTING: -403404.03033334 FEET
CENTRAL MERIDIAN AT 116° 15' 0" WEST
CENTRAL MERIDIAN OF STATE PLANE, CA VI (FIPS 0406)

7. FOR SECTIONS & DETAILS, SEE DWG. (LATER)
8. ALL EARTHWORK SHALL BE IN ACCORDANCE WITH SPECIFICATION 25670-000-3PS-CE01-00001.
8. OIL/WATER SEPARATOR SHALL BE (LATER).
9. FOR STORM DRAIN SECTIONS & DETAILS, SEE DWG. (LATER).

LEGEND:

PROJECT BOUNDARY

WATER FLOW

0 50 100 150
1" = 50'

PRELIMINARY ISSUE NOT FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CHK	DES. SUPV.	ENGR.	PROJ ENGR	APPR
A	26 OCT 11	ISSUED FOR REVIEW	LAP	duf	-			

SCALE	DATE	DESIGNED	DRAWN	CHIEF ENGR.

BrightSource

BECHTEL POWER CORP.
DEDICATED TO SAFETY EXCELLENCE - ZERO ACCIDENTS
FREDERICK, MARYLAND

RIO MESA
SOLAR ELECTRIC GENERATING FACILITY

UNIT 2
ROUGH GRADING AND DRAINAGE PLAN

BSII (L.td.)	OWNER DRAWING NO.	
	TBD	
BECHTEL	JOB NO.	DRAWING NO.	REV.
	25670	002-CG-0010-00001	A

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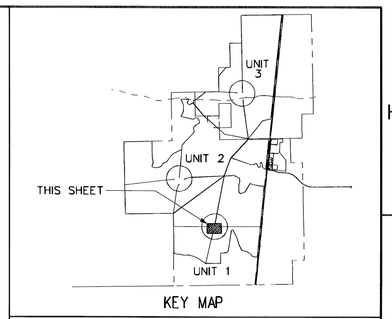
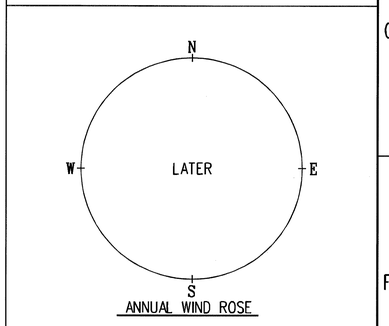


KEY MAP



ANNUAL WIND ROSE

NOTES:

1. FOR COORDINATE SYSTEM, COORDINATES OF PROJECT BOUNDARY & VERTICAL DATUM, SEE SITE PLAN DRAWING 000-C2-0000-00001.
2. FOR STANDARD FENCING TYPES, DETAILS AND NOTES, SEE DWG. 000-C0-0090-00003 & 000-C0-0090-00006.
3. FOR GROUNDING DETAILS, SEE BECHTEL ENGINEERING DESIGN STANDARD FOR GROUNDING NOTES, SYMBOLS AND DETAILS NO. 000-EGJ-0000-00001.
4. ALL GATES WITH AN OPENING 8' OR LARGER SHALL BE DOUBLE SWING GATES.
5. SEE DRAWING NOS. 000-EG-0000-00001 AND 000-EG-0000-00002 FOR CONNECTION DETAILS BETWEEN FENCING AND THE ELECTRICAL GROUNDING SYSTEM.
6. THE COORDINATES SHOWN ON THIS DRAWING ARE BASED ON A LOCAL COORDINATE GRID REFERENCING THE CENTER OF POINT 660 AS 30,000 E, 70,000 N IN THE CALIFORNIA VI STATE PLANE COORDINATE SYSTEM (NAD 83, FEET).

A. HORIZONTAL DATUM:
NORTH AMERICAN DATUM 1983

B. UNIT OF MEASUREMENT
U.S. SURVEY FEET

C. GRID ORIGIN:
BASED ON THE CENTER OF POINT 660:
PLANT NORTHING: 70,000.0000 FEET
PLANT EASTING: 30,000.0000 FEET
STATE PLANE, CA VI NORTHING: 2,113,820.697 FEET
STATE PLANE, CA VI EASTING: 7,009,888.916 FEET
LATITUDE: 33° 27' 32.640" NORTH
LONGITUDE: 114° 46' 49.220" WEST

D. GRID PARAMETERS:
MODIFIED FALSE NORTHING: -418222.24933334 FEET
MODIFIED FALSE EASTING: -403404.03033334 FEET
CENTRAL MERIDIAN AT 116° 15'0" WEST
CENTRAL MERIDIAN OF STATE PLANE, CA VI (FIPS 0406)

7. FOR SECTIONS & DETAILS, SEE DWG. (LATER)
8. ALL EARTHWORK SHALL BE IN ACCORDANCE WITH SPECIFICATION 25670-000-3PS-CE01-00001.
8. OIL/WATER SEPARATOR SHALL BE (LATER).
9. FOR STORM DRAIN SECTIONS & DETAILS, SEE DWG. (LATER).

LEGEND:

PROJECT BOUNDARY

WATER FLOW

0 50 100 150
1" = 50'

NO.	DATE	REVISIONS	BY	CHK	DES SUPV.	ENGR.	PROJ ENGR	APPR
A	26 OCT 11	ISSUED FOR REVIEW	LAP		-			

SCALE | DATE | DESIGNED | DRAWN | CHIEF ENGR.

BrightSource

BECHTEL POWER CORP.
DEDICATED TO SAFETY EXCELLENCE - ZERO ACCIDENTS
FREDERICK, MARYLAND

RIO MESA
SOLAR ELECTRIC GENERATING FACILITY

UNIT 1
ROUGH GRADING AND
DRAINAGE PLAN

BSII (Ltd.)

OWNER DRAWING NO.
TBD

JOB NO.	DRAWING NO.	REV.
25670	001-CG-0010-00001	A

PRELIMINARY ISSUE
NOT FOR
CONSTRUCTION

34"X44"E SIZE
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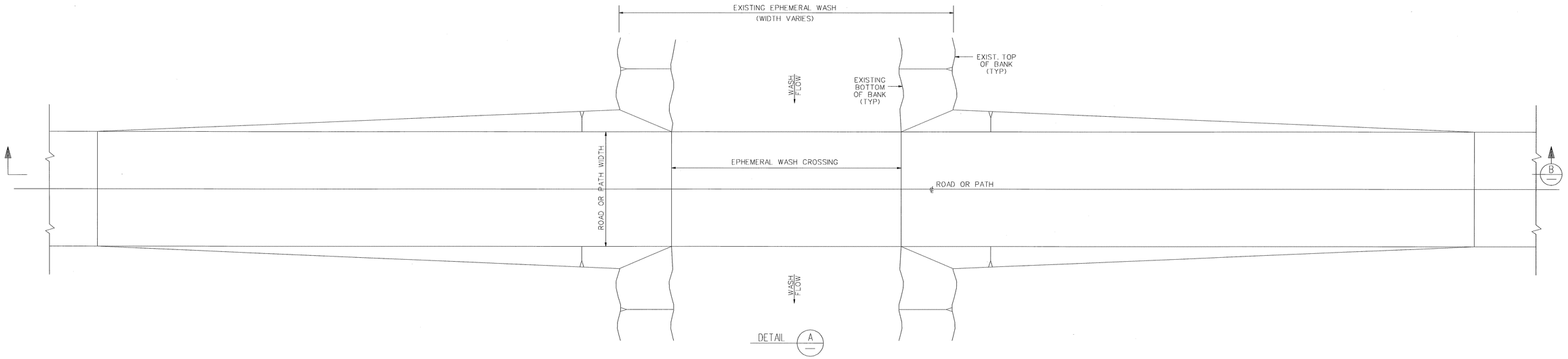

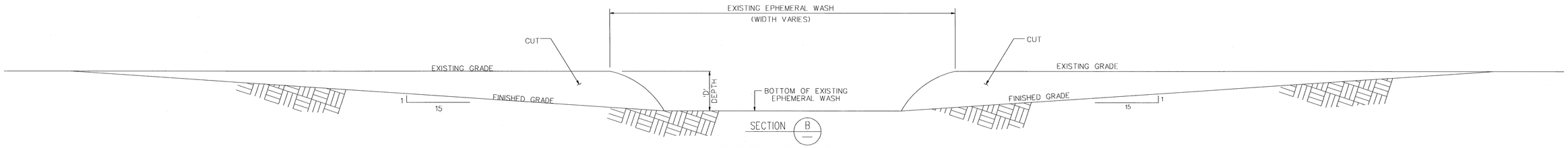

EPHEMERAL WASH CROSSING

APPLICABLE TO DIRT ROADS AND HELIOSTAT MAINTAINENCE PATHS

NOTES:

1. THE EPHEMERAL WASH CROSSING APPLIES TO ALL WASH INTERSECTIONS WITH 12' WIDE DIRT ROADS AND 10' WIDE HELIOSTAT MAINTENANCE PATHS.
2. ALL CROSSING RAMP EXCAVATION WILL HAVE SIDE SLOPES AT 3:1 TO MEET EXISTING GRADE.
3. SIDE SLOPES AND ROAD/PATH EXCAVATION SHALL BE TREATED WITH A CHEMICAL SOIL STABILIZER UPON COMPLETION OF GRADING AT EACH LOCATION.

NOTE:
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A	8/15/11	ISSUED FOR REVIEW	LAP					

SCALE NTS | DATE 8/15/11 | DESIGNED | DRAWN LAP | CHIEF ENGR.

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GRADING & SURFACING DETAILS
FOR EPHEMERAL WASH CROSSING

BSII (Ltd.) | OWNER DRAWING NO. TBD

JOB NO.	DRAWING NO.	REV.
25670	000-CG-0090-00001	A

34"X44" E SIZE
PSC-

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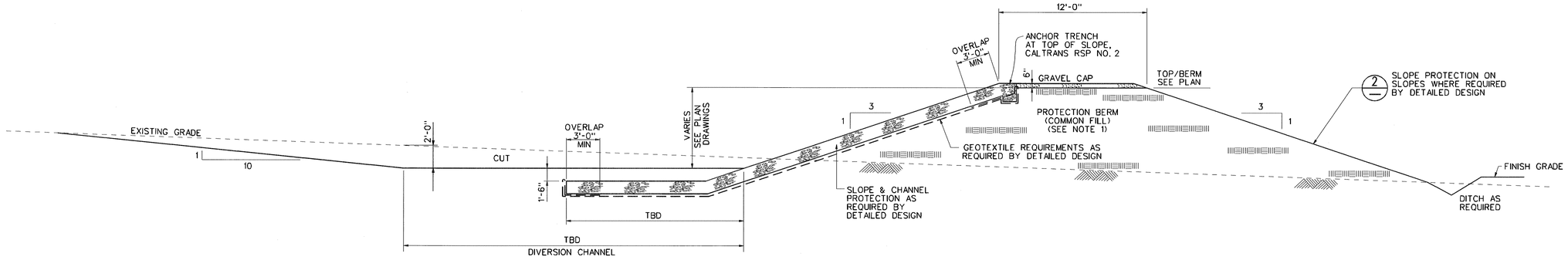
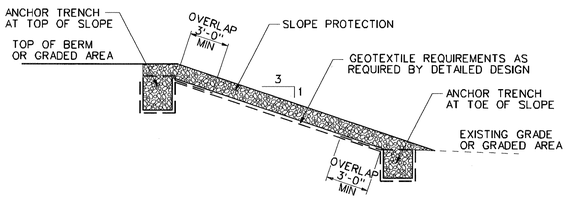


DETAIL 1 / NTS

DIVERSION CHANNEL AND PROTECTION BERM

DETAIL TO BE APPLIED WHERE REQUIRED BY DETAILED DESIGN



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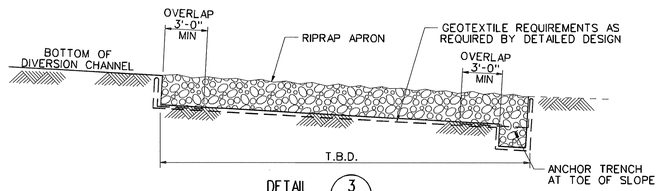

DETAIL 3 / NTS

DIVERSION CHANNEL AND PROTECTION BERM RIPRAP AREA

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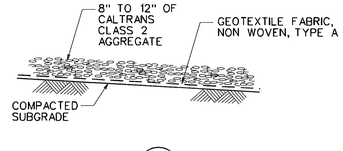

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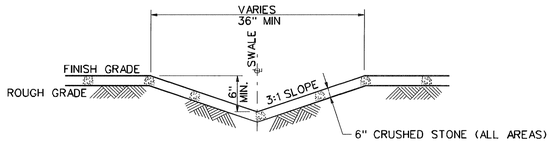
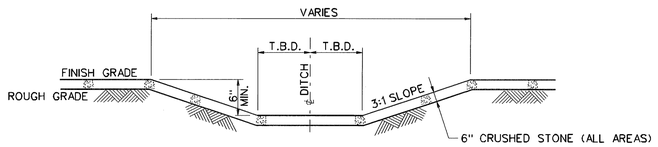


TYPICAL GRAVEL/CRUSHED STONE SWALE

FOR YARD AREAS (ASTM D422)

DETAIL 5 / NTS

DETAIL TO BE APPLIED WHERE REQUIRED BY DETAILED DESIGN

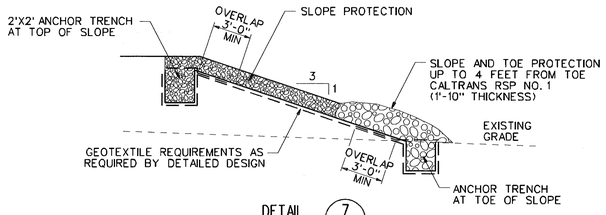


TYPICAL GRAVEL/CRUSHED STONE FLAT BOTTOM DITCH

FOR YARD AREAS (ASTM D422)

DETAIL 6 / NTS

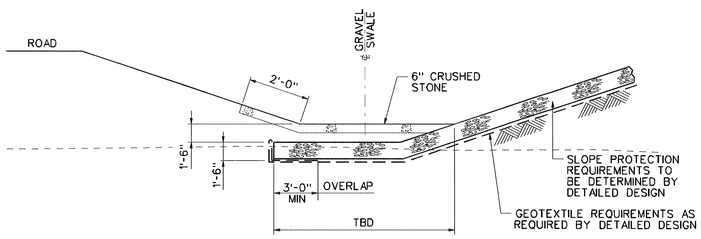
DETAIL TO BE APPLIED WHERE REQUIRED BY DETAILED DESIGN



DETAIL 7 / NTS

POWER BLOCK SLOPE PROTECTION

DETAIL TO BE APPLIED WHERE REQUIRED BY DETAILED DESIGN



DETAIL 8 / NTS

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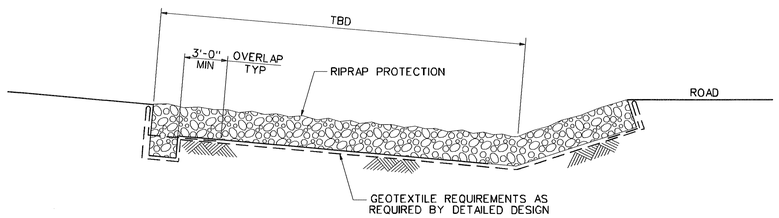

DETAIL 9 / NTS

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NOTES:

1. COMMON FILL AS SHOWN SHALL BE COMPACTED TO 95% DENSITY AT OPTIMUM MOISTURE CONTENT (MODIFIED PROCTOR).

NO.	DATE	REVISIONS	BY	CHK	DES. SUPV.	ENGR.	PROJ ENGR	APPR.
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SCALE NTS | DATE 8/15/11 | DESIGNED | DRAWN LAP | CHIEF ENGR.

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SITE WORK SHEET 5
TYPICAL GRADING & SURFACING DETAILS

BSII (Ltd.) | OWNER DRAWING NO. TBD

JOB NO.	DRAWING NO.	REV.
25670	000-C0-0090-00005	A

34"X44"E SIZE

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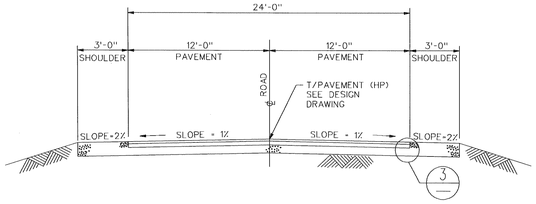
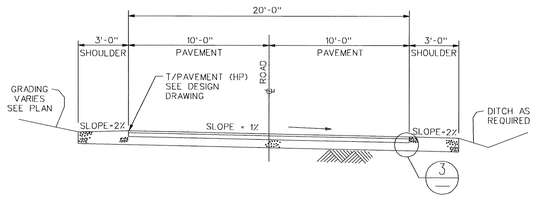


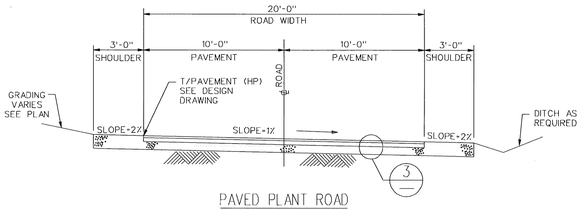
MAIN ROAD, SHARED ROAD & COMMON AREA ENTRANCE ROADS

DETAIL 1



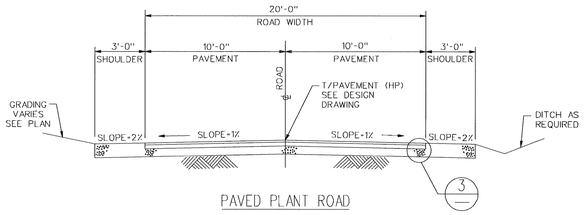
UNITS 1, 2 & 3 PAVED PLANT ENTRANCE ROADS

DETAIL 1A



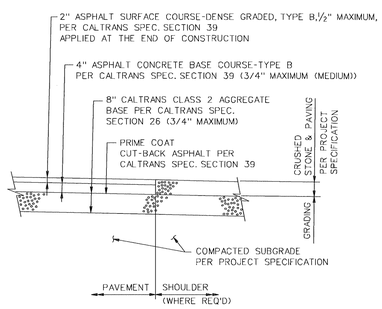
PAVED PLANT ROAD

DETAIL 2A



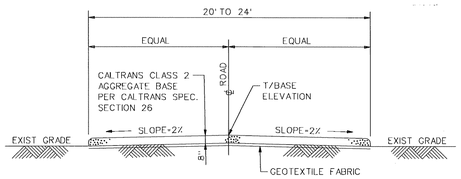
PAVED PLANT ROAD

DETAIL 2B



ROAD PAVING DETAIL

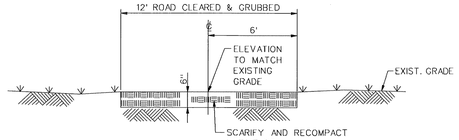
DETAIL 3



GRAVEL CONSTRUCTION ROAD

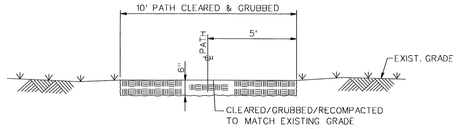
(WHERE REQUIRED IN FIELD)

DETAIL 4



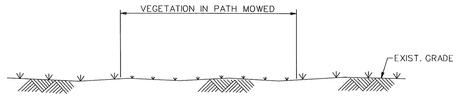
DIRT ROAD

DETAIL 5



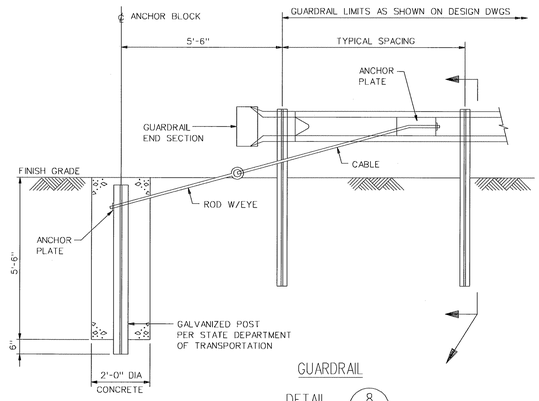
HELIOSTAT MAINTENANCE PATH

DETAIL 6



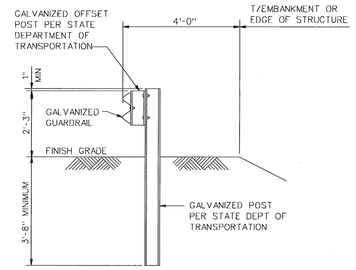
NO DRIVE ZONES

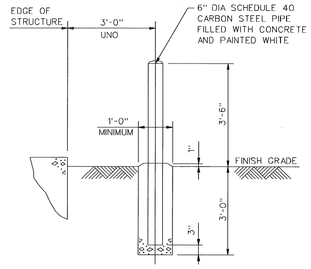
DETAIL 7



GUARDRAIL

DETAIL 8





GUARD POST OR BOLLARD

LOCATIONS PER DESIGN DWGS

DETAIL 9

PRELIMINARY
NOT FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CHK	DES. SUPV.	ENGR.	PROJ ENGR	APPR
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SCALE NTS | DATE 8/15/11 | DESIGNED | DRAWN LAP | CHIEF ENGR.

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SITE WORK SHEET 4
TYPICAL GRADING & SURFACING DETAILS

BSII (Ltd.)

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TBD

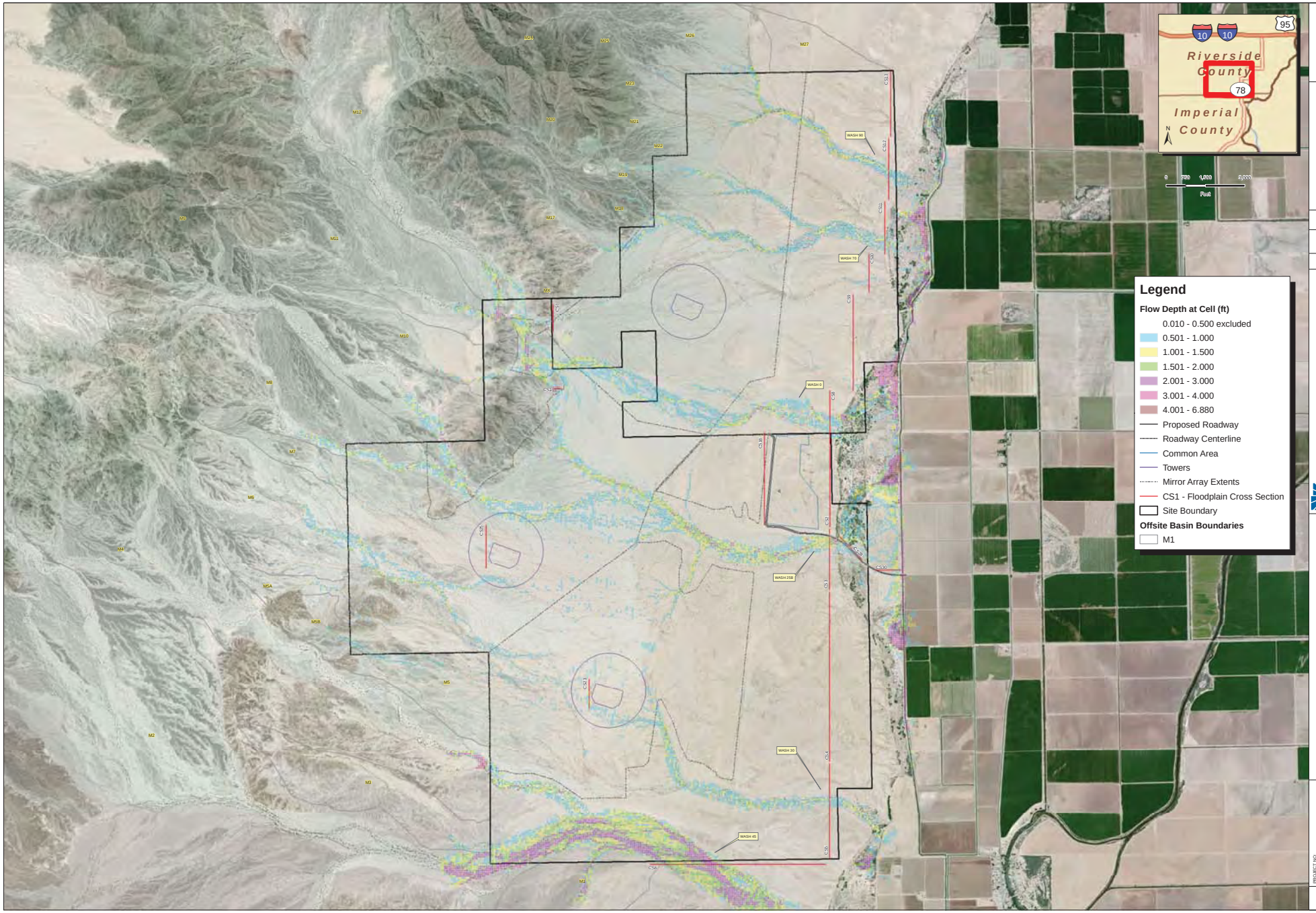
JOB NO.	DRAWING NO.	REV.
25670	000-C0-0090-00004	A

34"X44" E SIZE

8 7 6 5 4 3 2 1

ATTACHMENT DR 78-1

FLO-2D DEPTH MAP 24-HR 100-YR DEVELOPED CONDITION



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REV.	DATE	BY	REVISION

BrightSource

RIVERSIDE COUNTY, CA

2727 S. Rainbow Boulevard
Las Vegas, NV 89146
Tel (702) 873-7530
Fax (702) 362-2597
www.vtnw.com

FLO-2D DEPTH MAP
24HR-100YR
DEVELOPED CONDITION

RIO MESA SOLAR

PROJECT NO: 7323
DRAWN BY: SB
DATE: 8/25/2011
SCALE: 1 " = 1,500 '

SHEET
7323HYD200A

DATE: 8/18/2011 File: \\vtnw.com\dfs\hydrology\7323-Ryfie\Preliminary-Site Investigation\GIS\MXD\DEVELOPED FLO2D\7323-Flo2d-100yr-depth-dev.mxd

BSE Document Control Number: 7323HYD300-FINAL

ATTACHMENT DR 80-1

PRELIMINARY STORMWATER POLLUTION PREVENTION PLAN

Bechtel Document No. 25670-000-4CP-T07G-00001-00A

Preliminary Stormwater Pollution Prevention Plan

For:
Rio Mesa Solar Electric Generating Facility
Docket No. 2011-AFC-04

Risk Level: 1

Legally Responsible Person (LRP):
Rio Mesa Solar I, LLC; Rio Mesa Solar II, LLC; and Rio Mesa III, LLC
1999 Harrison Street, Suite 2150
Oakland, CA 94612
Name – Todd Stewart
Phone No.- 510-550-8908

Prepared for:
California Energy Commission Compliance Project Manager
Bureau of Land Management Authorized Officer

Project Site Location/Address:
Southern California's Mojave Desert in Riverside County, California
Blythe, California 92225

SWPPP Prepared By:
Dr. Kit Ng, Assistant Chief G&HES, Professional Engineer (Civil) No. 51065
(301) 228-7652
Bechtel Power Corporation – Rio Mesa Solar Electric Generating Facility Project
5275 Westview Drive
Frederick, Maryland 21703-8306

SWPPP Preparation Date:
February 2012

Estimated Project Dates:
Start of Construction: July 2013
Completion of Construction: March 2016

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SWPPP Certification by Qualified SWPPP Developer

Project Name: Rio Mesa SEGF

Project Number: Not applicable

~~I~~certify under a penalty of law that I have secured appropriate QSD qualifications and that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that QSP and properly trained delegates gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

_____ February, 2012

Qualified SWPPP Developer Signature Date

Dr. Kit Ng, Assistant Chief G&HES

California Professional Engineer (Civil) No. 51065 301-228-7652

QSD Name and Title Telephone Number

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Section 1 SWPPP Requirements

1.1 Introduction

This Storm Water Pollution Prevention Plan (SWPPP) has been prepared for the proposed Rio Mesa Solar Electric Generating Facility (RMSEGF) to comply with the California's General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (General Permit) and the State Water Resources Control Board (SWRCB) Order No. 2009-0009-DWQ (see Appendix A) effective July 1, 2010, as amended by Order 2010-0014-DWQ. The RMSEGF will be located in the eastern Mojave Desert, Riverside County, California as shown in Figure 1 (Appendix B). The RMSEGF is being developed by Rio Mesa Solar Partners I, II, and III (Owner). The engineering-procurement-construction contractor is Bechtel Power Corporation.

This SWPPP has been developed by a QSD (Dr. Kit Ng) and future amendments/revisions to this Plan will be by a QSD.

The SWPPP shall be designed to address the following objectives:

- All pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled;
- Where not otherwise required to be under a Regional Water Quality Control Board (RWQCB) permit, all non-stormwater discharges are identified and either eliminated, controlled, or treated;
- Site BMPs are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges from construction activity to the Best Available Technology/Best Control Technology (BAT/BCT) standard;
- Calculations and design details as well as BMP controls for site run-on are complete and correct, and,
- Stabilization BMPs installed to reduce or eliminate pollutants after construction are completed.
- Identify post-construction BMPs, which are those measures to be installed during construction that are intended to reduce or eliminate pollutants after construction is completed
- Identify and provide methods to implement BMP inspection, visual monitoring, and Construction Site Monitoring Program (CSMP) requirements to comply with the General Permit.

1.2 Permit Registration Documents

The Permit Registration Documents (PRDs) are limited to the copy of the Signed Certification Statement, Site or Vicinity Map (Figure 1), and Risk Assessment. In addition to these PRDs, the other associated Water

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Pollution Control Drawings (Figures 2 to 33) and associated Hydraulic Analysis are also included in Appendix B.

The Water Pollution Control Drawings address the following project elements:

Site Map – Figure 1 shows the location of the RMSEGF project site and the overall configuration of Rio Mesa 1, 2, 3 and the Common Area. Also shown in Figure 1 are the major geographic features in the project vicinity including watercourses, existing utilities and sensitive areas.

Site Delineation – Figures 2 through 8 show the locations of existing structures, and layout of the project site including project boundaries, security and tortoise fences, proposed structures, plant access roads, utilities and corridors, and construction facilities.

Drainage:

- Topography: Topography of the site vicinity is depicted in Figure 9. It forms the basis for the delineation of existing upstream tributary areas, downstream drainage areas, and major watercourses (washes) for the evaluation of stormwater runoff and flood hazard for the existing (predevelopment) condition.

- Proposed Grade: Proposed rough grade elevations for the permanent and construction facilities for Rio Mesa 1, 2, 3 and the Common Area including road crossing over major ephemeral washes, proposed flood protection berm and channel, drainage swales and tie-ins to the existing topography are shown in Figures 10 through 14.

- Hydrology: Existing (pre-development) and proposed (post-development) hydrologic calculations for onsite areas and offsite areas are to be developed in conformance with state and local regulations.

- Hydraulics: The selection and sizing of the onsite drainage system and diversion facilities is to be developed in conformance with state and local regulations.

Watercourses and Critical Areas – Figures 1, 2, 9 show the locations of onsite and nearby watercourses including drainage ditches relative to RMSEGF. Wash crossings will be identified later. To the east of the site is the Palo Verde irrigation canal system.

Clearing and Grading – Site areas to be cleared and graded for permanent project facilities include the power block area, the Switchyard area, the Administration Building and storage, the flood protection berms and diversion channels, the main plant access road, paved and unpaved plant roads, and production wells area. Figures 25 to 29 show the road grading and paving for the main access road to the site. Figures 30 to 33 show the paving plan for Rio Mesa 1, 2, 3 and the Common Area. Site areas to be cleared and graded for temporary construction facilities and elements include the Heliostat Building and the construction laydown and stockpile. Figures 22 to 23 include grading and surfacing details for the project.

Soil, Wind and Water Erosion Control – The general layout and details of the drainage, wind and water erosion and sediment controls for Rio Mesa 1, 2, 3 and the Common Area are shown in Figures 15 to 18, with the details provided in Figures 19 and 20. Typical fencing sections and details are shown in Figures 21 and 24.

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The RMSEGF California Energy Commission Final Decision is expected to include specific exemptions from filing a Notice of Intent (NOI) and other purely administrative requirements. Consequently, a separate electronic NOI filing will not be made via the SMARTS system and this SWPPP does not include a specific WDID number (issued following a NOI filing). The language shown below has been applied to other solar thermal projects in the area and expected to apply to the RMSEGF Project.

> **A. Storm Water Discharges**
> Waste in discharges of storm water must be reduced or prevented to achieve the best practicable treatment level using controls, structures, and management practices. The applicant shall comply with all requirements (with the exception of purely administrative requirements, e.g., filing a Notice of Intent) contained in State Water Resources Control Board's (SWRCB) *Waste Discharge Requirements For Discharges of Storm Water Runoff Associated With Construction Activity, General Permit No. CAS00002*; *Waste Discharge Requirements For Discharges of Storm Water Associated With Industrial Activities, General Permit No. CAS00001*; and all subsequent revisions and amendments.

1.3 SWPPP Availability and Implementation

The General Permit (Section XIV.C) requires the SWPPP be available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone. The SWPPP shall be implemented concurrently with the start of ground disturbing activities.

1.4 SWPPP Amendments

The General Permit requires that SWPPP be amended or revised by a QSD (Section XIV.A) and that the SWPPP include a listing of the date of initial preparation and the date of each amendment. Amendments must be signed by a QSD (Section VII.B.6). Amends will be dated, attached to the SWPPP and logged in the SWPPP (Appendix C).

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1.5 Retention of Records

Records will be retained for a minimum of 3 years for the following items:

- Site inspections (including visual observations and non-stormwater inspections)
- Correction Actions
- Discharge reports (including field reports, laboratory analytical results)
- Annual Reports
- QA/QC records
- Approved SWPPP document and amendments

These records and any requested information to determine compliance with this General Permit will be maintained in the ES&H office onsite and shall be furnished to the CEC Compliance Project Manager, BLM Authorized Officer, Colorado River Basin Water Quality Control Board, SWRCB, or US Environmental Protection Agency (EPA) within a reasonable time. This information will also be maintained in a project specific electronic document storage system

1.6 Required Non-compliance Reporting

If a discharge occurs or if the project receives a written notice of non-compliance, the QSP/Site Manager will immediately notify the Project Manager who will inform the Owner in writing within seven days of the event.

The Owner will subsequently file a written report to the CEC Compliance Project Manager, BLM Authorized Officer, Colorado River Basin Water Quality Control Board within 30 days of identification of non-compliance and/or report the violation. Electric notification using the SMARTS systems may be used (if applicable).

Non-compliance issues could potentially include:

- Self-reporting of any other discharge violations or to comply with RWQCB enforcement actions; and
- Discharges which contain a hazardous substance in excess of reportable quantities established in 40 CFR §§ 117.3 and 302.4.

Corrective measures will be implemented immediately following the discharge, notice, or order. The results of noncompliance events will be maintained in Appendix D.

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1.7 Annual Report

By September 1 of each year, the Rio Mesa Solar Partners I, II, and III LLC (Owner) shall submit an Annual Report which will highlight the site personnel awareness of the required data collection and reporting elements associated with the SWPPP.

- The Report will include (per Section XVI of the General Permit) a summary of:
- Corrective actions and compliance activities, including those not implemented;
- Violations of the General Permit;
- Date, time, place, and name(s) of the inspector(s) for all sampling, inspections, and field measurement activities;
- Visual observation and sample collection exception records; and
- Training documentation of all personnel responsible for General Permit compliance activities.

1.8 Changes to Permit Coverage

The General Permit (Section II.C) allows a permittee to reduce or increase the total acreage covered under the General Permit when a portion of the project is complete and/or conditions for termination of coverage have been met; when ownership of a portion of the project is sold to a different entity; or when new acreage is added to the project.

Should the RMSEGF identify changes in site acreage (or project ownership) to be covered by the SWPPP, the Owner will submit appropriate modifications to the PRD documents (potentially electronically) in accordance with requirements of the General Permit within 30 days of a reduction or increase in total disturbed area. Updates to PRDs submitted are contained in SWPPP Appendix D. Documentation of the SWPPP revisions or amendments is contained in Appendix C.

1.9 Notice of Termination

In recognition that the Rio Mesa Solar Electric Generating Facility project is exempt from filing a NOI and related purely administrative requirements, it will not be necessary to file a Notice of Termination (NOT) for this project.

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Section 2 Project Information

2.1 Project and Site Description

The Rio Mesa Solar Electric Generating Facility (–Rio Mesa SEGF" or –Project") will be located in Riverside County approximately 12 miles southwest of Blythe, California, and will be constructed in three phases. The Project will be comprised of three solar plants: the southernmost plant will be known as Rio Mesa I, the middle plant will be known as Rio Mesa II, and the northernmost plant will be known as Rio Mesa III. The Project is partially on private land and partially on federal property managed by the U. S. Bureau of Land Management (BLM).

Each plant requires approximately 1,850 acres (or 2.9 square miles) and includes a power block area surrounded by an array of approximately 85,000 heliostats. The nominal capacity of each solar plant is 250 megawatts (MW), for a total Project nominal output of 750 MW. Certain facilities for the Project will be shared by the three plants and located in a –common area". Facilities within the Common Area serve all three power units and include primarily the Administration Building, the Switchyard, three groundwater production wells, a groundwater monitoring well, two evaporation ponds, and a temporary Heliostat (assembly) Building. Each power generating unit will include a solar field occupied by heliostat arrays and a power block where the power tower, steam generation and electric conversion systems will be located. The Rio Mesa SEGF site is about 5,795 acres in area and most of which will be occupied by the heliostat arrays.

The Project will deliver power at 220 kilovolts (kV) to Southern California Edison's (SCE) Colorado River Substation (CRS). From each power block area, power will be transmitted underground at 220 kV to the Project switchyard (located in the common area). Project power is then transmitted via a common 9.7 mile generator tie-line (gen-tie line) to the CRS.

The Project owners (Rio Mesa Solar I, LLC; Rio Mesa Solar II, LLC; and Rio Mesa Solar III, LLC) each own one of the three solar plants. These three entities will hold equal one-third shares in the ownership of the common facilities required by the three solar plants. These three project-limited liability companies are Delaware limited liability companies. BrightSource Energy, Inc. (BrightSource), the parent company of the limited liability companies, is a Delaware corporation. BrightSource is a technology and development company. The Owner will use BrightSource's solar thermal technology for the Rio Mesa SEGF

Land Occupancy

The Rio Mesa SEGF project (for all three units and the Common Areas) will occupy approximately 5,795 acres (Figures 3 through 6). Each plant requires approximately 1,850 acres (or 2.9 square miles) and includes a power block area surrounded by an array of approximately 85,000 heliostats. The nominal capacity of each solar plant is 250 megawatts (MW), for a total Project nominal output of 750 MW. The Common Area, situated on the east boundary of the project, between Rio Mesa II and III will occupy approximately 115 acres and will include shared facilities (administration/storage building, switchyard, groundwater production wells). Portions of this construction logistics area will be used during construction for staging and temporary offices

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Heliostat Arrays

Each power plant will be surrounded by heliostat arrays. Each 250-megawatt plant (Rio Mesa I, II and III) will have heliostat arrays consisting of approximately 85,000 heliostats. The heliostat arrays will be arranged around a single centralized solar power tower. The heliostats will automatically track the sun throughout the day and reflect the solar energy to the boiler on top of the tower. Each heliostat consists of two mirrors and each heliostat mirror is 8.6 ft (2.6 m) wide by 12.0 ft (3.66 m) high, yielding a reflecting surface of 103.2 ft^2 (9.52 m^2). The two mirrors are mounted on a single pylon, along with a computer-programmed aiming control system that directs the motion of the heliostat to track the movement of the sun. The pylons will be fabricated from 6-inch pipe, and they will be embedded in the ground so as to resist lateral forces due to wind or flood flows.

Power Blocks

Each power plant unit will have a solar power tower, steam-turbine generator, an air-cooled condenser and auxiliary systems, which collectively are referred to as the power block. The tower supports the receiving boiler and moves steam to the turbines near its base. The combined height of towers and boiler will be about 750 ft. For each power plant, the power-block lateral dimensions will be about 800 ft wide by about 1200 ft long, which represents an area of about 22 acres. The power block for each unit will be graded with moderate slopes to direct runoff to swale/ditches and pass stormwater through the oil/water separators before releasing flow to outlet aprons, where placement of stone rip-rap will prevent local erosion and reinstate natural sheet flow conditions toward downstream. Each power block will be protected by a flood protection berm and associated diversion channel, which will be designed for a 100-year storm event. The preliminary design of the protection berm and diversion channel is shown in Figures 11 through 13.

A wastewater treatment system (WWTS) is provided in each plant. For each plant, miscellaneous wastewater created during operation will be collected and processed through the WWTS. The WWTS clean effluent will be recycled to the treated water storage tank for reuse within the plant. The concentrated effluent from the WWTS is transported by truck to the evaporation ponds located in the common area.

Substation

The Project will deliver power at 220 kilovolts (kV) to Southern California Edison's (SCE) Substation (CRS). From each power block area, power will be transmitted underground at 220 kV to the Project switchyard (located in the common area). Project power is then transmitted via a common 9.7 mile generator tie-line (gen-tie line) to the CRS.

Common Administrative Area

As shown in Figure 14, an administration, warehouse, and maintenance complex, also part of the common area, will be located next to the 24-ft plant entrance road. The complex will require about 3.1 acres, but the building footprint and parking area will occupy about 1.4 acres. Two evaporation ponds, with an area of about 2 acres each, are located east of the administration building.

Next to the administrative area is a graded well area housing a storage tank and three pumped wells. Water pumped from the wells will be treated at the raw water treatment system (RWTS) located in the common area.

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The treated water will be used for mirror washing, auxiliary cooling makeup, process makeup and potable water. A WWTS is provided in the common area. The reject waste from the RWTS and other miscellaneous sump waste generated during operation in the water treatment building will be collected and processed through the common area WWTS. The WWTS clean effluent will be reused as mirror wash water. The WWTS concentrated effluent will be discharged into the facility's evaporation ponds.

Access Roads and Service Paths

The Rio Mesa SEGF access will be with a 24-ft paved road that connects to the existing 34th Ave (Figure 2). This 34th Ave is an existing dirt road, which intersects with Interstate 78. Additionally, 20-ft paved access roads will be created to access the power blocks of the three Rio Mesa plant sites within the fenced solar sites. The paved roads will follow the existing terrain to the extent practicable but will potential become a barrier to the natural overland flow from the upslope areas especially during regular, less severe, storm events. The total length of the 20-ft paved road is about 14,500 ft. Where necessary, drainage culverts will be installed to pass storm water flow at the ephemeral wash crossings to the downstream side of the roads. During severe rainfall events, it is expected that the flood flow will overtop the road surfaces. Finally, 12-ft dirt roads would be installed diagonally through the heliostat fields and used for access to the heliostat maintenance paths. Moreover, 12-ft dirt roads would be installed as perimeter roads at the fence line of each Rio Mesa unit. The total length of 24-foot paved roads is about 12,700 ft, the total length of the 12-foot diagonal access dirt roads is about 34,000 ft, and the total length of the 12-foot perimeter dirt roads is about 148,000 ft. Within the heliostat fields, ungraded maintenance paths will be located concentrically around the power block to provide access to the heliostat mirrors for maintenance and cleaning. The typical distance between the heliostat maintenance paths center-lines is 152.6 ft (46.5 m). The paths will follow the existing topography and will occupy about 6 percent of the solar field. The total pathway length for the heliostat maintenance paths is about 1,423,500 ft for all three Units. Both the dirt roads and the heliostat maintenance paths will follow closely the existing topography to minimize land disturbance and to maintain the pre-development hydrologic condition to the maximum extent possible.

Precipitation

The project site is located in southern California in Riverside County, close to Palo Verde. The project site is part of the Imperial Reservoir Watershed and it is located within the Colorado River Hydrologic Region. The mean annual precipitation (1948 to 2010) recorded at the Blythe Airport weather station is 3.54 inches per year. Most of the precipitation in the project area falls during January through March and July through September. Based on the NOAA Atlas 14, the 24-hour precipitation in the site vicinity (based on the Blythe Station with Site ID: 04-0924) for the 100-year, 25-year and 10-year storm events is 3.86 inches, 2.83 inches, and 2.19 inches, respectively (NOAA, 2006).

The precipitation values were derived using the NOAA Atlas 14 website program, which can be accessed via the following link:

(http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html)

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Drainage

Stormwater runoff at the site is predominantly sheet flow from west to east. With exception of the immediate areas near the power blocks, substation, and the common administrative area, the general pre-development drainage and flood flow patterns will be maintained. The flood protection berms and channels at the power block and Common Area will intercept and divert stormwater flow from the upstream areas for storm events up to a 100-year return period to downstream of the protected areas. Riprap aprons are provided at the downstream ends of the protection berms/channels to reduce the flood flow velocity and to restore the natural drainage patterns downstream. Away from the power block and the Common Area, some ephemeral washes will be disturbed as a result of providing the necessary crossings for the roads to allow for plant access. At grade crossings will be used wherever possible, otherwise drainage culverts will be provided at the wash crossings to facilitate the passage of stormwater flow. As a result of the design concept to maintain the roads and paths at grade to minimize disturbance to the natural drainage to the extent practicable, all paved roads, dirt roads and maintenance paths on site will be subject to overtopping during high flood flow events. Areas disturbed by the tracked vehicles for the installation of the heliostats and will not be graded for the permanent facilities will be restored to their natural grades immediately after construction.

As shown in Figures 11 to 14, stormwater will be diverted away from the power block, the substation and the common administrative area by berms/channels on the upslope sides of the areas to be protected. The protection berms, will be designed for a 100-year storm event. The power block and the areas where the Administration Building and production wells are located will be graded with moderate slopes to direct runoff away and will implement BMPs as needed to reduce erosion and to promote a natural sheet flow condition in the downstream area. Runoff collected from areas with potential oil and grease contamination will pass through oil/water separator units sized in accordance with Riverside WQMP requirements before discharge. At the location where the main plant access road crosses the diversion channel and berm into the power block, culverts may be constructed to pass the flood flow from a 100-year storm event. The preliminary flood flow estimation using the HEC-1 model and alluvial fan methodology is included in Appendix B.

The stormwater best management practices, described in this DESCP, follow the California Storm Water Quality Association (CASQA) California Storm Water BMP Handbooks, the Caltran Construction Stormwater BMPs and Caltran 2010 Standard Plans and Specifications, and comply with new NPDES General Permit for Storm Water Discharges from Construction Activities No. CA000002.

Temporary construction laydown, temporary heliostat assembly building area, and parking areas are shown in Figures 7 and 8. Erosion and sediment control plans for the three Rio Mesa units are shown in Figures 15 to 18. A temporary drainage system and/or flood protection measures will be installed as needed to control of storm water during construction.

Areas to be Cleared and Graded

The existing site has about a two (2) percent or less and relatively uniform natural slope up from east to west, located on a relatively small drainage basin with the hydrologic characteristics of alluvial fans. Majority of the areas within the project property boundaries will be occupied by the heliostats. The erection and operation of the majority of the heliostat arrays requires only limited topsoil stripping and local leveling of significant changes in the terrain. Heliostats are relatively small (13 ft high each) and light (100 kilograms each) structures, contain no hazardous materials, and are not essential structures. More substantial grading will be

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limited to the power block areas, substation and common administration building, and the major access roads. During construction period, an area housing the heliostat assembly building that is within the common area will also be graded.

Within the heliostat arrays, vegetation along the maintenance paths will be cleared with a blade to reduce the risk of fire. Scalping vegetation with a grader blade will likely go a couple inches into the soil and leave some of the existing root systems intact to anchor the soil at locations where the vegetation was cleared, reducing the potential for erosion. In areas of substantial grading (power block areas, substation, the common administrative building area, heliostat assembly building area, major access roads and in heliostat field areas requiring significant improvements to grade for access roads), about one foot of topsoil will be stripped, in order to remove plants and roots to accommodate heliostat erection in the solar field, and as pre-excavation activity in the power block and solar tower areas. To the extent possible, stripped topsoil will be reused to form the final site grades. Succulent plant species would be salvaged prior to construction, transplanted into windrows, and maintained in the nursery area for later transplanting following decommissioning. Shrubs and other plant species would be revegetated by the collection of seeds, and re-seeding following decommissioning. Natural grades and existing drainage patterns in the solar field will be maintained where practical.

All underground piping and wiring will be installed, followed by installation of the foundation for the new power blocks, solar towers and associated structures.

For the construction of each power block, the parking areas for construction workers will be located off one of the access roads before the entrance to the power block. For the construction of facilities within the common area, parking areas for construction workers will be located off the access road to the common administrative area, as well as off the access road to the heliostat assembly building area. These temporary parking areas will be closed after the construction phase. No pavement will be applied and minimum clearance of the location will be used. The laydown areas for construction materials will be located within the common area.

Primary access to the site is via the 34th Ave interchange on Interstate 78. In addition, the access roads to individual plants will be paved from their point of connection to the main 24 feet plant access road. Access road beds will typically be 30 feet of asphalt with 5-foot-wide crushed rock shoulders. Stabilized entrances/exits and wheel wash facility will be provided prior to vehicle exiting the construction areas to minimize mud and sediment from being carried on to the public road.

Existing and Proposed Topography

As shown in Figure 9, the existing site has about a 2 percent or less and relatively uniform natural slope up from east to west, which can be accommodated by the heliostat fields. The sites topography varies across each heliostat field requiring different levels of disturbance to obtain the final topography suitable for the erection and operation of the heliostats. Grade and topography are to be modified (if required) to ensure the minimum disturbance needed for the access of installation equipment and materials. In areas where the existing terrain will permit access, grading will be restricted and only vegetation is to be removed. In areas where the existing topography requires modification, access will be improved by leveling (cut and filling) or conventional grading (where required).

At completion of the project, onsite drainage will be accomplished through gravity flow. Stormwater will flow through the heliostat fields and diverted around the power blocks and switchyard on their north and south sides

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to channel storm runoff around each area before overflowing through rip-raps to reinstate the natural drainage conditions.

Volumes of Cut and Fill

The grading of the site to design elevations will require cut and fill. Preliminary cut and fill volumes for each project element are to be provided later. Trenches excavated for the underground utilities will be entirely refilled. The power block in each unit will require fill to elevate the foundation and to erect the berm. The fill material will use the cut material from the site as much as possible including the surplus cut volume from the heliostat field or roads.

2.2 Stormwater Run-on From Off-Site Areas

With exception of the immediate areas near the power blocks, substation, and the common administrative area, the general pre-development drainage and flood flow patterns will be maintained. The flood protection berms and channels at the power block and Common Area will intercept and divert stormwater flow from the upstream areas for storm events up to a 100-year return period to downstream of the protected areas. Riprap aprons are provided at the downstream ends of the protection berms/channels to reduce the flood flow velocity and to restore the natural drainage patterns downstream.

There is potential for debris to accumulate along the permit fence during flood conditions. Regular maintenance will be performed along the permit fence to remove this debris.

Further details are provided in Section 2.1 and Appendix B, Hydraulic Analysis.

2.3 Findings of the Construction Site Sediment and Receiving Water Risk Determination

The risk of accelerated erosion and sedimentation from wind and water depends on a number of factors, including proximity to receiving water bodies, climate, topography, and soil type. Construction General Permit (2009) requires dischargers to assess the risk level of a site based on both sediment transport and receiving water risk. Risk levels are established by determining two factors: first, the site's sediment risk; and second, receiving water risk during periods of soil exposure (i.e., grading and site stabilization). Both factors are used to determine the combined site-specific Risk Level.

The site Sediment Risk factor was determined to be LOW, as the estimated soil loss is less than 15 tons per acre. The Receiving Water (RW) Risk Factor is determined as Low. With the assessment of low risk on both sediment transport and receiving water, the combined risk for the RMSEGF project was determined to be Level 1.

The details of the risk level determination for the RMSEGF project using the Risk Determination Worksheet from the General Permit (2009) are shown in Appendix B.

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2.4 Construction Schedule

Construction would take place over approximately 33 months, from the fourth quarter of 2013 to first quarter 2016.

Significant grading commences in mid 2013. Commercial operations of the three plants are expected to commence in 2015 and 2016. Additional schedule details are shown in Appendix F.

2.5 Potential Construction Site Pollutant Sources

The following is a list of construction materials that will be used and activities that will be performed that will have the potential to contribute pollutants, other than sediment:

- Vehicle fluids, including oil, grease, petroleum, and coolants
- Asphaltic emulsions associated with asphalt-concrete paving operations
- Cement materials associated with portland cement concrete (PCC)
- Base and sub base material
- Joint and curing compounds
- Concrete curing compounds
- Paints
- Solvents, thinners, acids
- BMP materials
- Treated lumber (materials and waste)
- PCC rubble
- General litter

Construction activities that have the potential to contribute sediment to stormwater discharges include:

- Clear and grub operations
- Grading operations
- Paving operations
- Boring operations
- Delivery/transportation operations
- Utility excavation operations
- Foundation/structure construction operations
- Vehicle and equipment cleaning, fueling, and maintenance

The deployment of BMPs regarding these pollutant sources and pathways are described in following section (Section 3).

Implementation and location of BMPs are shown on the water pollution control drawings in Appendix B. Appendix G includes copies of the fact sheets of all the BMPs selected for this project.

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2.6 Identification of Non-Stormwater Discharges

There will be a variety of chemicals stored and used during the construction of Rio Mesa SEGF. The quantities of hazardous materials that will be onsite during construction will generally be limited to gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, various lubricants, paint, and paint thinner. There are no feasible alternatives to vehicle fuels and oils for operating construction equipment. The types of paint required are dictated by the types of equipment and structures that must be coated and by the manufacturers' requirements for coating.

There will also be a variety of waste products that could be precursor to non-stormwater discharges. These wastes are categorized below:

Nonhazardous Solid Waste

Listed below are nonhazardous waste streams that could potentially be generated from construction activities.

Paper, Wood, Glass, and Plastics**.** Paper, wood, glass, and plastics will be generated from packing materials, waste lumber, insulation, and empty nonhazardous chemical containers during project construction. These wastes will be recycled where practical. Waste that cannot be recycled will be disposed of weekly in a Class III landfill. Onsite, the waste will be placed in dumpsters.

Concrete. Waste concrete will be disposed of in a Class III landfill or at clean fill sites, if available or will be recycled and disposed of at a construction and demolition site. During construction of the foundations, a concrete washout area will be required. The concrete washout areas will be located near the main entrance to the site. Dumping of excess concrete and washing out of delivery vehicles will be prohibited at other locations onsite. Notices will be posted to inform all drivers.

Metal. Waste metal, including steel from welding/cutting operations, packing materials, and empty nonhazardous chemical containers, and aluminum waste from packing materials and electrical wiring will be recycled where practical and nonrecyclable waste will be deposited in a Class III landfill.

Wastewater. Wastewater generated during construction will include stormwater runoff, pressure testing water, sanitary wastes (portable toilets) and equipment washdown water. Depending on the chemical quality of these wastewaters, they could be classified as hazardous or nonhazardous. The waste waters would be sampled and if they are hazardous would be disposed of in accordance with applicable regulations.

Stainless steel piping will be tested with demineralized water, while carbon steel piping will be pressure tested using either demineralized water or potable water. Demineralized water would be trucked in. After hydrostatic testing, the test water will be chemically analyzed for contaminants and discharged to the concrete holding basins located at the power block, unless the analysis shows that the water is contaminated, in which case the water would be trucked to an appropriate disposal facility.

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Hazardous Waste

Most of the hazardous waste generated during construction will consist of liquid waste, such as water from flushing and cleaning fluids, passivating fluid (to prepare pipes for use), and solvents. Some hazardous solid waste, such as welding materials, batteries, and dried paint, may also be generated.

Flushing and cleaning waste liquid will be generated as pipes are cleaned and flushed. The volume of flushing and cleaning liquid waste generated is estimated to be one to two times the internal volume of the pipes cleaned. The quantity of welding, solvent, batteries, and paint waste is expected to be minimal. Wastewaters generated during construction could also be considered hazardous, if demonstrated so by sampling.

The construction contractor will be considered the generator of hazardous construction waste and will be responsible for proper handling of hazardous waste in compliance with all applicable federal, state, and local laws and regulations. The Construction Waste Management Plan (pending) and Hazardous Waste Management Plan (pending) have been developed to manage hazardous waste and material management. This responsibility will include licensing, personnel training, accumulation limits and times, and reporting and recordkeeping.

The hazardous waste will be collected in satellite accumulation containers near the points of generation. It will be moved daily to the contractor's 90-day hazardous waste storage area located at the site construction laydown area. The waste will be removed from the site by a certified hazardous waste collection company and delivered to an authorized hazardous waste management facility, before expiration of the 90-day storage limit.

Potential Contaminated Soil

The project area is characterized by a desert scrub community dominated by creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). The ground surface is primarily comprised of coalesced and dissected alluvial fans and desert washes. It is unlikely that, with exception of light cattle grazing, there has been any other historical use of the site. Soils in the area are not expected to be contaminated. No existing site features have, as a result of past usage, contributed pollutants to stormwater (e.g., toxic materials that have been treated, stored, disposed of, spilled, or leaked onto the construction site).

As such, it is unlikely that contaminated soil will be encountered during construction. However, operators and construction personnel will be asked to report unusual conditions to the appropriate personnel and the area and/or material will be properly contained during investigative actions. As described earlier, the Owner will be responsible for management of pre-existing site contamination including contaminated soils.

If soils (contaminated by construction activities) require temporary stockpiling, piles will be placed on and covered with plastic sheeting or tarps that are secured safely with sand bags and bermed with fiber rolls or silt fencing to prevent runoff from leaving the area. If required, samples will be collected and sent to a certified analytical laboratory for characterization. If contamination is detected, the waste will be handled and properly disposed of in an authorized waste management facility.

The following BMP will be considered:

- Contaminated Soil Management (WM-7)

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Section 3 Best Management Practices

3.1 Schedule for BMP Implementation

BMPs for erosion and sediment control will be early features of the site development process recognizing their importance during initial grading operations. As evidenced in the construction schedule details listed in Appendix F perimeter, silt fence activities are combined with perimeter security/tortoise fencing activities as one of the earliest activities – well before any significant site clearing or grading activities. Soon thereafter, the construction site entrance is stabilized and road stabilization and paving commences of the main access road. Vehicle fuel and equipment storage are added in parallel with development of construction support facilities. Concrete washout facilities are developed prior to concrete deliveries.

3.2 Erosion and Sediment Control

Erosion Control

Erosion control, also referred to as soil stabilization, is a source control measure that is designed to prevent soil particles from detaching and becoming transported in stormwater runoff. Erosion control BMPs protect the soil surface by covering or binding soil particles. The project will incorporate erosion control measures required by regulatory agency permits, contract documents, and other measures selected by the Contractor.

To reduce erosion, project construction will minimize land disturbance by limiting construction activities only to areas that are essential to the installation and operation of the project. Grading is not intended to level the site, but rather to prepare the site for installation and future maintenance of the heliostats. Vegetation will only be cleared in areas where the existing terrain will not permit access of installation equipment and materials during construction. Vegetation will be cut at a height (12 – 18 inches) that allows clearance for heliostat function and leaves the root structures intact to anchor the soil, reducing the potential for erosion.

Cleared vegetation will be stockpiled for onsite or offsite disposal. Prior to grading work, sensitive plants and selected succulents may be salvaged, relocated or surrounded by a visible barrier.

Clearing and grubbing (roots to be removed) and extensive site grading will be limited to the power block areas, receiving towers, major access roads, possibly the rerouted trails, the substation, and in common areas where the existing topography requires modification in order to provide access for installation equipment and materials during construction. Disking and light grading may be used prior to compaction by rolling. Disturbed soils that are permanently covered by project facilities will be compacted to reduce the rainfall absorptive capacity and vegetative productivity of the soils.

It will be necessary to segregate and stockpile surface soils and organic matter during construction and excavation. In areas of substantial grading, native vegetation may be harvested for possible reuse to obtain-long term soil stabilization. All excavated soils are to be reused during construction at the site to prevent subsequent erosion and sedimentation issues. Materials suitable for backfill will be stored in stockpiles at designated locations using proper erosion and sediment control methods.

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BMPs will be implemented to follow the progress of grading and construction. As the locations of soil disturbances change, erosion and sedimentation controls will be adjusted accordingly to control stormwater runoff at the downgrade perimeter. BMPs will be in place throughout the entire construction period.

Non-active areas will be stabilized as soon as feasible after construction is complete and no later than 14 days after construction in that portion of the site has temporarily or permanently ceased.

Sufficient erosion control materials will be maintained onsite to allow implementation in conformance with Permit requirements and described in this SWPPP. This includes implementation requirements for active areas and non-active areas that require deployment before the onset of rain.

Maintenance of BMPs will be according to measures outlined in the applicable CASQA Handbook BMP (2011) factsheets.

Site-specific BMPs and associated figures are shown in the Water Pollution Control Drawings in Appendix B. Appendix G contains BMP fact-sheets with applicable detailed descriptions of suitability, implementation, and inspection and maintenance measures. The following general erosion control measures may be used during various phases of the project:

- Proper scheduling and sequencing of activities (EC-1)
- Preservation of existing vegetation (EC-2)
- Placement of geotextiles, plastic covers, and erosion control blankets/mats (EC-7)
- Earth dikes and drainage swales (EC-9)
- Velocity dissipation devices (EC-10)

Sediment Control

Sediment controls are intended to complement and enhance the selected erosion control measures and reduce sediment discharges from active construction areas. Sediment controls are designed to intercept and settle out soil particles that have been detached and transported by the force of water. The project will incorporate sediment control measures required by regulatory agency permits, contract documents, and other appropriate measures selected.

Stone filters and check dams will be strategically placed throughout the project site to provide areas for sediment deposition and to promote the sheet flow of stormwater. Where available, native materials (rock and gravel) will be used to construct the stone filter and check dams. In addition, diversion berms are to be used to redirect stormwater, as required.

Groundwater will be applied to disturbed soil areas of the project site to control dust and maintain optimum moisture levels for compaction as needed.

The access roads to individual plants will be paved from their point of connection to the 34th Ave. The 34th Ave, from its intersection with Interstate 78 to the project site, will also be paved. The public roadways will be maintained to minimize pollution from dust, dirt and debris caused by construction activities. These streets will be swept at the end of the day if visible soil materials are carried onto them

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Stockpiles will be covered prior to forecasted storm events and during windy conditions.

BMPs will be deployed in a sequence to follow the progress of grading and construction. As the locations of soil disturbance change, sedimentation controls will be adjusted accordingly to control stormwater runoff at the downgrade perimeter.

Sufficient quantities of temporary sediment control materials will be maintained onsite throughout the duration of the project, to allow implementation of temporary sediment controls in the event of predicted rain, and for rapid response to failures or emergencies, in conformance with other Permit requirements and as described in this SWPPP. This includes implementation requirements for active areas and non-active areas before the onset of rain.

Maintenance of BMPs will be according to measures outlined in the applicable CASQA Handbook BMP factsheets (2011).

Site-specific BMPs and associated figures are listed in shown in the Water Pollution Control Drawings in Appendix B. Appendix G contains BMP fact-sheets with applicable detailed descriptions of suitability, implementation, and inspection and maintenance measures. The following general sediment control measures may be used during various phases of the project:

- Silt Fences (SE-1)
- Fiber Rolls (SE-5)
- Wind Erosion Control (WE-1)
- Stockpile management (WM-3)

Tracking Control

Controls will be in place to minimize or eliminate soils from being tracked off the project site from vehicles. Primary access to the site is via the 34th Ave interchange on I-78. 34th Ave will be paved from its intersection Interstate 78 to the project site. In addition, the access roads to individual plants will be paved from their point of connection to the main access road to the project site. A stabilized entrance/exit and a wheel wash facility will be provided to clean vehicle wheels prior to exiting the construction area.

The parking and laydown areas will be stabilized with coarse gravel. All surfaces will be regularly watered to reduce generation of dust, but will not be excessively watered so as to generate runoff. As shown in Figures 15 to 18, silt fences or fiber rolls will be used at edges of these areas, as necessary to minimize sediment discharging into swales or ditches.

All public roadways will be maintained regularly to minimize pollution from dust, dirt and debris caused by construction activities. These streets will be swept at the end of the day if visible soil materials are carried onto them.

Site-specific BMPs and associated figures are included in the Water Pollution Control Drawings in Appendix B. Appendix G contains BMP fact-sheets with applicable detailed descriptions of suitability, implementation, and inspection and maintenance measures. The following control methods will be considered for offsite vehicle tracking, as necessary:

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- Stabilized construction entrance/exit (TC-1)
- Stabilized construction roadway (TC-2)
- Tire wash (TC-3)
- Street sweeping and vacuuming (SE-7)

Wind Erosion Control

During construction of the project and the related linear facilities, dust erosion control measures would be implemented to minimize the wind-blown loss of soil from the site. Groundwater will be applied to disturbed soil areas of the project site to control dust and maintain optimum moisture levels for compaction as needed, but will not be excessively watered so as to generate runoff. Alternative dust suppressants such as Soil Sement may be employed to supplement watering.

Site-specific BMPs and associated figures are included in Water Pollution Control Drawings in Appendix B. Appendix G contains BMP fact-sheets with applicable detailed descriptions of suitability, implementation, and inspection and maintenance measures. The following control method will be considered for dust suppression, as necessary:

- Wind erosion control (WE-1)
- Stockpile management (WM-3)
- Water conservation practices (NS-1)

Additional details regarding dust control and air quality construction management issues are addressed in the pending Air Quality Construction Mitigation Plan.

3.3 Non-Stormwater Control and Material Management

Non-Stormwater Control

Rio Mesa SEGF will use hazardous materials during construction (see Section 2.3.5) , such as vehicle fluids, including oil, grease, petroleum, and coolants, paints, solvents and curing compounds. The project will comply with good engineering practices, applicable laws and regulations for the storage and use of these materials to minimize the potential for a release of hazardous materials, and will conduct emergency response planning to address public health concerns regarding hazardous materials use and storage.

A dedicated fueling area will be protected with berms and/or dikes to prevent runon, runoff, and to contain spills. Self-propelled vehicles will be fueled offsite or at the on-site fueling area. Fuel trucks will be used for onsite fueling for mobile fueling elsewhere on the site. Drip pans will be used for mobile fueling. Each fuel truck will be equipped with absorbent spill cleanup materials and a spill containment boom at all times.

Drip pans or absorbent pads will be used for vehicle and equipment maintenance activities that involve grease, oil, solvents, or other vehicle fluids.

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Vehicles and equipment will be inspected daily and before coming onsite for signs of leaks and be on a regular maintenance schedule.

Drip pans or absorbent materials will be placed under paving equipment when not in use; paving equipment will be parked over plastic to prevent soil contamination. If during dewatering activities any contamination is detected via odors or visible sheens, the collected stormwater will be handled and properly disposed of in a manner consistent with federal, state, and local regulations.

Site-specific BMPs and associated figures are included in the Water Pollution Control Drawings in Appendix B. Appendix G contains BMP fact-sheets with applicable detailed descriptions of suitability, implementation, and inspection and maintenance measures. The following control methods will be considered for non-stormwater controls, as necessary:

- Water Conservation Practices (NS-1)
- Paving and Grinding Operations (NS-3)
- Vehicle and equipment cleaning (NS-8)
- Vehicle and equipment refueling (NS-9)
- Vehicle and equipment maintenance (NS-10)
- Concrete Curing (NS-12)

Materials Management

There will be a variety of chemicals stored and used and wastes generated during the construction of Rio Mesa SEGF (See Section 2.3.6). Management of these materials is addressed by a number of plans.

A Hazardous Materials Business Plan may be prepared during the course of project development which will address operational materials. In accordance with these regulations, the Hazardous Materials Business Plan would include an inventory and location map of hazardous materials onsite and an emergency response plan for hazardous materials incidents.

The pending Construction Waste Management and the Hazardous Material Management Plans will be the primary material management documents for the construction phase of work. The quantities of hazardous materials that will be onsite during construction will generally be limited to gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, various lubricants, paint, and paint thinner. There are no feasible alternatives to vehicle fuels and oils for operating construction equipment. The types of paint required are dictated by the types of equipment and structures that must be coated and by the manufacturers' requirements for coating.

The Contractor will implement BMP WM-9, Sanitary and Septic Waste Management, and portable toilets will be located and maintained for the duration of the project. Weekly maintenance will be provided and wastes will be disposed of offsite. The toilets will be located away from concentrated flow paths and traffic flow.

Site-specific BMPs and associated figures are included in the Water Pollution Control Drawings in Appendix B. Appendix G contains BMP fact-sheets with applicable detailed descriptions of suitability, implementation, and inspection and maintenance measures. The following BMPs will be considered for waste management and materials pollution control:

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- Material delivery and storage (WM-1)
- Material use (WM-2)
- Stockpile management (WM-3)
- Spill prevention and control (WM-4)
- Solid waste management (WM-5)
- Hazardous waste management (WM-6)
- Concrete Waste Management (WM-8)
- Sanitary/Septic Waste Management (WM-9)
- Liquid waste management (WM-10)

3.4 Post-Construction Stormwater Management Measures

Overall the project is being designed to maintain, to the extent possible, the existing sheet flow patterns on the site.

As construction nears completion, areas used for parking, storage and laydown will be cleared and stabilized. Site areas disturbed during construction may be permanently stabilized by aggregate paving, bituminous paving, hydromulch, or approved soil binders.

At completion of the project, onsite drainage will be accomplished through gravity flow. Stormwater will flow through the heliostat fields and be diverted around structures such as the power blocks on their north and south sides in drainage channels, to channel storm runoff around each area before overflowing through native stone rip-rap to reinstate natural sheet flow conditions. Stormwater within the power block areas will pass through an oil/water/sand separator prior to discharge.

Within the heliostat array fields, the cut vegetation will have the root structures intact to anchor the soil, reducing the potential for erosion.

Heliostats are relatively small (about 13 feet high), contain no hazardous materials, and are not essential structures. While their potential structural failures in flood conditions do not pose a risk to personnel, the heliostats supports will be driven into the ground at depth which is designed to prevent scour failure during a 100-year storm event. Onsite water consumption will be minimal—mainly to replace boiler feedwater blowdown and provide deionized water for washing heliostat mirrors. The latter is required in a washing cycle of 2 weeks, during which all heliostats are washed, to maintain them at full performance.

At grade crossings are used wherever possible, otherwise drainage culverts are provided at the wash crossings to facilitate the passage of storm water flow. The paved roads follow the existing terrain to the extent practicable. Where necessary, drainage culverts are used to pass storm water flow at the ephemeral wash crossings to the downstream side of the roads.

Routine vehicle traffic during project operation would be largely confined to existing roads, most of which will be paved or covered with gravel. Mirror washing will be performed once every 2 weeks by the machine modified to have a reach to clean approximately eight mirrors before needing to move; thereby, allowing the

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machine to drive on every other maintenance path instead of every path every 2 weeks. Standard operating activities would not involve the disruption of soil. When linear facilities need to be inspected or maintained, vehicle traffic near these areas would be minimal.

The post-construction BMPs described above will be funded and maintained by the Owner

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Section 4 BMP Inspection, Maintenance and Rain Event Action Plans

4.1 BMP Inspection and Maintenance

The Qualified SWPPP Practitioner (QSP) or designated representative will inspect the site prior to a forecast storm, after a rain event that cause runoff from the construction site, at 24-hour intervals during extended rain events, and as specified in the contract documents. SWPPP inspections may be conducted in conjunction with other facility inspections.

The goals of these inspections are:

- to identify areas contributing to a stormwater discharge;
- to evaluate whether measures to reduce pollutant loadings identified in the SWPPP are adequate, properly installed and functioning in accordance with the terms of the General Permit; and
- to determine whether additional control practices or corrective maintenance activities are needed.

The results of inspections and assessments will be documented. Copies of the completed inspection checklists will be maintained with the SWPPP; a copy will be provided to the Project Manager within 24 hours of the inspection. Site inspections conducted for monitoring purposes will be performed using the inspection checklist shown in Appendix H. BMP fact-sheets in Appendix G will be referenced for inspection and maintenance measures for each selected BMP. Necessary corrective actions will begin to be implemented within 72 hours of their discovery.

4.2 Risk Event Action Plans

The RMSEGF site was determined to be a Risk Level 1 discharger (Section 2.3 and Appendix B), consequently Rain Event Action Plans (REAP) do not need to be developed. Consequently, there is also no separate appendix regarding a project specific REAP template.

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Section 5 Training

As required by the General Permit (Section VII) all elements of the SWPPP have been developed by a Qualified SWPPP Developer (QSD) and will be implemented by a Qualified SWPPP Practitioner (QSP). The QSP may delegate BMP installation, inspection, maintenance and repair, recordkeeping activities to trained personnel who are provided adequate supervision and oversight.

Prior to project startup, all designated onsite representatives will participate in a pre-project stormwater training workshop. The workshop will cover basic stormwater information, the requirements of the General Permit, and the SWPPP. Specifically, the workshop will focus on implementation, inspection, and maintenance of stormwater controls.

- Contractors are responsible for familiarizing their personnel with the information contained in the SWPPP. Contractors will be informed of this obligation.
- All new employees will be trained by staff familiar with these topics.
- Contractors are responsible for familiarizing subcontractors with information contained in the SWPPP.

Ongoing, formal training sessions will be selected from one of the following organizations:

- California Regional Water Quality Control Board
- International Erosion Control Association
- U.S. Environmental Protection Agency (EPA)
- Recognized municipal stakeholder organizations throughout California
- Professional organizations and societies in building and construction

Informal training will include tailgate site briefings to be conducted bi-weekly and will address proper installation methods and maintenance for the following topics:

- Erosion control BMPs
- Sediment control BMPs
- Tracking control BMPs
- Wind erosion control BMPs
- Non-stormwater BMPs
- Waste management and materials pollution control BMPs
- Emergency procedures specific to the construction site stormwater management

The training log showing formal and informal training of various Contractor personnel is shown in Appendix I. Training documentation will be made part of the Annual Report.

This SWPPP was prepared by Bechtel under the direction of the QSD, Dr. Kit Ng.

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Section 6 Responsible Parties and Operators

6.1 Responsible Parties

Table 6-1 lists the individuals responsible for stormwater pollution prevention. Additional details are shown in Appendix J.

TABLE 6-1 List of Responsible Individuals

Name/Company	Responsibility	Phone Number	Address
TBD	Site Manager	TBD	TBD
Dr. Kit Ng	Qualified SWPPP Developer (QSD)	301-228-7652	5275 Westview Drive Frederick, MD 21703
TBD	Qualified SWPPP Practitioner (QSP)	TBD	TBD
TBD	Project Field Engineer	TBD	TBD
Peter Carr/Bechtel	Project Environmental Lead	301-349-2040 240-344-0897	5275 Westview Drive Frederick, MD 21703

6.2 Subcontractor List

Subcontractor stormwater management measures will be directed by the QSP during the course of the project. If subcontractors change during the project, the associated list will be updated accordingly. The subcontractor log is included in Appendix K.

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Section 7 Construction Site Monitoring Program

7.1 Purpose

The purpose of this section is to provide an annotated summary of the Construction Site Monitoring Plan (see Appendix L for complete plan) to meet the General Permit Risk Level 1 requirements (visual observations and non-visible pollutants).

7.2 Applicability of Permit Requirements

The specific monitoring required for each construction site depends upon the project risk level, project size, BMPs implemented and effluent quality. Given the RMSEGF Risk Level 1 status and the lack of sediment basins the California Handbook (2011) Tables D-2 for Risk Level 1 Monitoring generate the following applicable monitoring requirements (Table 7-1).

Table 7-1 Monitoring Requirements

Type of Monitoring		When
Sampling & Analysis	Non-visible pollutants: spill/BMP failure based on pollutant source assessment	Within first two hours of discharge from site. Collect samples of runoff affected by the spilled or released material(s) and runoff that is unaffected by the spilled or released material(s).
Visual Inspections	Non-stormwater inspection	Quarterly for each drainage area.
	Qualifying rain event: Pre-rain inspection	All drainage areas, BMPs, and stormwater containments within two business days of each qualifying rain event.
	Qualifying rain event: Post-rain inspection	All discharge locations within two business days after each qualifying rain event. Visually observe discharge of contained stormwater when discharged.
	During rain inspection	See BMP inspections guidance.
	BMP	Weekly and every 24 hours during extended storm events.

7.3 Weather and Rain Event Tracking

Visual monitoring and inspections requirements of the General Permit are triggered by a qualifying rain event. The General Permit defines a qualifying rain event as any event that produces ½ inch of precipitation. A minimum of 48 hours of dry weather will be used to distinguish between separate qualifying storm events.

Weather Tracking

The QSP should daily consult the National Oceanographic and Atmospheric Administration (NOAA) for the weather forecasts. These forecasts can be obtained at http://www.srh.noaa.gov/. Weather reports should be printed and maintained with the SWPPP.

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Rain Gauges

The QSP shall install [Enter Number and General Location for On-site Gauges] rain gauge(s) on the project site. Locate the gauge in an open area away from obstructions such as trees or overhangs. Mount the gauge on a post at a height of 3 to 5 feet with the gauge extending several inches beyond the post. Make sure that the top of the gauge is level. Make sure the post is not in an area where rainwater can indirectly splash from sheds, equipment, trailers, etc.

The rain gauge(s) shall be read daily during normal site scheduled hours. The rain gauge should be read at approximately the same time every day and the date and time of each reading recorded. Log rain gauge readings. Follow the rain gauge instructions to obtain accurate measurements.

For comparison with the site rain gauge, the nearest appropriate governmental rain gauge(s) is located at the Blythe Landfill, Riverside County Flood Control Station 439.

7.4 Monitoring Locations

Monitoring and sampling locations will be based on proximity to planned non-visible pollutant storage, occurrence, or use; accessibility for sampling; personnel safety; and other factors in accordance with the applicable requirements in the General Permit.

- Sampling locations have been identified for the collection of runoff samples from material storage areas with spill potential.
- Power block drainage outlets – downstream of the oil water separators
- A location has been identified for the collection of an uncontaminated sample of runoff as a background sample for comparison with the samples being analyzed for non-visible pollutants. This location was selected such that the sample will not have come in contact with operational or storage areas associated with the materials, wastes, and activities identified or disturbed soils areas.

If an operational activity or stormwater inspection conducted 48 hours prior to or during a rain event identifies the presence of a material storage, waste storage, or operations area with spills or the potential for the discharge of non-visible pollutants to surface waters that was an unplanned location and has not been identified on the WPCDs in Appendix B, sampling locations will be selected using the same rationale as that used to identify planned locations.

7.5 Safety and Monitoring Exemptions

Safety practices for sample collection will be in accordance with the RMSEGF ESH Project Execution Plan. The primary safety concerns are with related to lightning from the thunderstorms (a primary source of rainfall) and from the potentially significant storm water flowing through existing ephemeral drainage pathways during rain events. Stormwater runoff at the site is predominantly sheet flow from west to east, eventually discharging into the Palo Verde Mesa region. With exception of the immediate areas near the power blocks, substation,

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and the common administrative area, the general pre-development drainage and flood flow patterns will be maintained – much of this flow follows ephemeral washes. Water levels can rise quickly in these step-sided washes, presenting risks to sampling activities conducted in these areas during storm events.

Consequently, sampling personnel will not be required to collect samples or conduct visual observations (inspections) under the following conditions:

- During dangerous weather conditions such as flooding and electrical storms.
- Outside of scheduled site business hours.

Construction will generally be scheduled to occur between 5:00 a.m. and 7:00 p.m. Additional hours may be necessary to make up schedule deficiencies, or to complete critical construction activities (e.g., pouring concrete at night during hot weather, working around time-critical shutdowns and constraints). During some construction periods and during the startup phase of the project, some activities may continue 24 hours per day, 7 days per week.

If monitoring (visual monitoring or sample collection) of the site is unsafe because of the dangerous conditions noted above then the QSP shall document the conditions for why an exception to performing the monitoring was necessary. The exemption documentation shall be part of the inspections reports (see Appendix _).

7.6 Visual Monitoring

Risk Level 1 sites are required to conduct visual monitoring (inspections). Visual monitoring includes inspections of BMPs, inspections before and after qualifying rain events, and inspection for non-stormwater discharges. Visual inspections are required for the duration of the project with the goal of confirming that appropriately selected BMPs have been implemented, are being maintained, and are effective in preventing potential pollutants from coming in contact with stormwater.

BMP Inspections

The General Permit requires that BMPs be inspected weekly and once each 24-hour period during extended storm events. The purpose of these inspections is to identify BMPs that:

- Need maintenance to operate effectively
- Failed; or
- Could fail to operate as intended.

If deficiencies are identified during BMP inspections, repairs or design changes to BMPs will be initiated within 72 hours of identification and completed as soon as possible.

All BMP inspections will be documented on an inspection checklist. The checklist includes:

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- Inspection date and date the inspection report was written;
- Weather information, including presence or absence of precipitation, estimate of the beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches;
- Site information, including stage of construction, activities completed, and approximate area of the site exposed;
- A description of the BMPs evaluated and any deficiencies noted;
- If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-stormwater controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations, and identify any projected maintenance activities;
- Report the presence of noticeable odors or any visible sheen on the surface of any dischargers;
- Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates;
- Photographs taken during the inspection, if any; and
- Inspector's name, title, and signature.

Qualifying Rain Event Inspections

The construction site be inspected within two days prior to a predicted qualifying rain event (50% probability National Weather Service forecast) and inspected within two days after a qualifying rain event (1/2 inch or more of precipitation within a greater than 48 hour period between events). These inspections will be performed during normal business hours of the construction site.

The pre-rain event inspection addresses:

- All stormwater drainage areas to identify any spills, leaks, or uncontrolled pollutant sources;
- All BMPs to identify whether they have been properly implemented per the SWPPP;
- Stormwater storage and containment areas to detect leaks and ensure maintenance of adequate freeboard; and
- The presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants within stored stormwater.

The post-rain event inspection addresses:

- All stormwater discharge locations;
- The discharge of stored or contained stormwater that is derived from and discharged subsequent to a qualifying rain event; and
- All BMPs to determine if they were adequately designed, implemented, and effective.

Inspection records will document:

- Personnel performing the observations;
- Observation dates (time and date);
- Weather conditions (including the rain gauge reading for the qualifying rain event);
- Locations observed; and

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- Corrective actions taken in response to observations.

The Visual Inspection Field Log Sheet is included in Appendix L.

Non-Stormwater Inspections

The Rio Mesa site will be inspected quarterly for the presence of non-stormwater discharges. These inspections focus on identifying unauthorized non-stormwater discharges and observing authorized non-stormwater discharges.

The quarterly inspections will address the each drainage area of the project and document:

- Presence or indications of unauthorized and authorized non-stormwater discharges and their sources;
- Pollutant characteristics of the non-stormwater discharge (floating and suspended material, sheen, discoloration, turbidity, odor, etc;
- Personnel performing the observations;
- Dates and approximate time each drainage area and non-stormwater discharge was observed; and
- Response taken to observations.

The Visual Inspection Field Log Sheet is included in Appendix L.

7.7 Water Quality Sampling and Analysis

The sampling and analysis activities described herein are designed to determine whether the Rio Mesa BMPs are effective in controlling potential construction site pollutants. The following sections addresses the potential pollutant sources, the Risk Level 1 sampling strategy and constituents, sampling locations and handling and the associated analytical methods and laboratories.

Pollutant Sources

Per the General Permit, the Risk Level 1 sampling is limited to non-stormwater related pollutant sources. No particle size analysis will be conducted, as the site will not be employing sediment basins.

The following construction materials, wastes, or activities are potential sources of non-visible pollutants to stormwater discharges from the RMSEGF construction process.

- Vehicle batteries
- Concrete pours and curing
- Sealants
- Adhesives
- Cleaning products
- Solvents; Thinners
- Fertilizers; Herbicides
- Dust palliatives

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- Soil binders
- Painting products
- Line flushing products
- Masonry products

Sampling Strategy Risk Level 1

Risk Level 1 projects like RMSEGF collect water samples for non-visible pollutants if there is (1) a breach, leakage, malfunction, or spill is observed; and (2) the leak or spill has not been cleaned up prior to the rain event; and (3) there is the potential for discharge of non-visible pollutants to surface waters or drainage system.

In conformance with the minimum of 48 hours of dry weather will be used to distinguish between separate rain events.

Collection of discharge samples for non-visible pollutant monitoring will be triggered when any of the following conditions are observed during inspections conducted before or during rain events:

- Materials or wastes containing potential non-visible pollutants are not stored under watertight conditions. Watertight conditions are defined as (1) storage in a watertight container, (2) storage under a watertight roof or within a building, or (3) storage protected by temporary cover and containment that prevents stormwater contact and runoff from the storage area.

- Materials or wastes containing potential non-visible pollutants are stored under watertight conditions, but (1) a breach, malfunction, leakage, or spill is observed, (2) the leak or spill is not cleaned up prior to the rain event, and (3) there is the potential for discharge of non-visible pollutants to surface waters or a storm sewer system.

- An operational activity with the potential to contribute non-visible pollutants (1) was occurring during or within 24 hours prior to the rain event, (2) applicable BMPs were observed to be breached, malfunction, or be improperly implemented, and (3) there is the potential for discharge of non-visible pollutants to surface waters.

- Soil amendments that have the potential to change the chemical properties, engineering properties, or erosion resistance of the soil have been applied, and there is the potential for discharge of non-visible pollutants to surface waters.

.Sampling Locations

Sampling locations are based on proximity to planned non-visible pollutant storage, occurrence, or use; accessibility for sampling; personnel safety; and other factors in accordance with the applicable requirements in the General Permit.

- Sampling locations have been identified for the collection of runoff samples from material storage areas with spill potential.

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- A location has been identified for the collection of an uncontaminated sample of runoff as a background sample for comparison with the samples being analyzed for non-visible pollutants. This location was selected such that the sample will not have come in contact with storage areas associated with the materials, wastes, and the activities identified or from disturbed soils areas.

If a construction activity or stormwater inspection conducted within two days prior to or during a qualifying rain event identifies the presence of a material storage, waste storage, or operations area with spills or the potential for the discharge of non-visible pollutants to surface waters that was an unplanned location and has not been identified on the WPCDs in Appendix B, sampling locations will be selected using the same rationale as that used to identify planned locations.

7.8 Active Treatment System

The Project does not require a project specific Sampling and Analysis Plan for an Active Treatment System (ATS) because deployment of an ATS is not planned.

7.9 Bioassessment Monitoring

The project is not subject to a bioassessment monitoring plan because is not a Risk Level 3 project.

7.10 Watershed Monitoring Option

The Watershed Monitoring option is applicable only in areas where the project site participates in a qualified regional watershed-based monitoring program. The Rio Mesa Project does not expect to participate in such a program, and consequently, the Project does not expect to secure any related exemptions from the normally applicable monitoring requirements of the General Permit.

7.11 Quality Assurance and Quality Control

Quality assurance and quality control details are described in the Construction Site Monitoring Plan described in Appendix L.

7.12 Reporting Requirements and Record Retention

Most reporting will be addressed in the Annual Report. The Annual Report will include:

- A summary and evaluation of all sampling and analysis results, including original laboratory reports;

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- The analytical method(s), method reporting unit(s), and MDL(s) of each analytical parameter (analytical results that are less than the MDL must be reported as "less than the MDL" or "<MDL");
- A summary of all corrective actions taken during the compliance year;
- Identification of any compliance activities or corrective actions that were not implemented;
- A summary of all violations of the General Permit;
- The individual(s) who performed facility inspections, sampling, visual observation (inspections), and/or measurements;
- The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements; and

In recognition of its status as Risk Level 1 Project which is being reviewed under the CEQA, if a discharge event occurs or a written notice of non-compliance is received, the QSP will immediately notify the Site Manager, and file a written report to Owner within seven (7) days of the discharge or notice. The Owner will file a written report to the CEC Compliance Project Manager and Colorado River Basin Water Quality Control Board within 30 days of identification of non-compliance. Corrective measures will be implemented immediately following the discharge, notice, or order.

The report to the Owner and Compliance Project Manager and Colorado River Basin Water Quality Control Board will contain the following items:

- The date, time, location, nature of operation, and type of unauthorized discharge, including the cause or nature of the notice or order
- The BMPs deployed before the discharge event, or prior to receiving the notice or order
- The date of deployment and type of BMPs deployed after the discharge event, or after receiving the notice or order, including additional measures installed or planned to reduce or prevent re-occurrence
- An implementation and maintenance schedule for any affected BMPs.

Monitoring related records will be retained for a minimum of 3 years for the following items:

- Site inspections (including visual observations and non-stormwater inspections)
- Correction Actions
- Discharge reports (including field reports, laboratory analytical results)
- Annual Reports
- QA/QC records

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Section 8 References

The following documents are made a part of this SWPPP by reference:

California State Water Resources Control Board, SWRCB (2009). National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities. Order No. 2009-0009-DWQ, NPDES NO. CAS000002.

California Stormwater Quality Association, CSQA (2011). California Stormwater Best Management Practices Handbook.

National Oceanic and Atmospheric Administration, NOAA, (2006), National Weather Service, Hydrometeorological Study Center, Precipitation Frequency Data Server (PFDS), Silver Spring, MD. Website: (Accessed 9/18/2010) http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

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Appendix A Construction General Permit

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Appendix B Submitted Permit Registration Documents

"Also see Signed Certification statement on Page iii of document."

SWPPP Certification by Qualified SWPPP Developer

Project Name: Rio Mesa SEGF

Project Number: Not applicable

~~I~~certify under a penalty of law that I have appropriate QSD qualifications and that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that QSP and properly trained delegates gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

_____ February xx, 2012

Qualified SWPPP Developer Signature Date

Dr. Kit Ng, Assistant Chief G&HES

California Professional Engineer (Civil) No. 51065 301-228-7652

QSD Name and Title Telephone Number

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Site Map

Figure 2 - 25670-000-C2-0000-00001-00B Site Plan

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Rio Mesa Solar Electric Generating Facility Risk Level Determination

The risk of accelerated erosion and sedimentation from wind and water depends on a number of factors, including proximity to receiving water bodies, climate, topography, and soil type. Construction General Permit Order 2009-0009-DWQ requires dischargers to assess the risk level of a site based on both sediment transport and receiving water risk. Risk levels are established by determining two factors: first, the site's sediment risk; and second, receiving water risk during periods of soil exposure (i.e., grading and site stabilization). Both factors are used to determine the combined site-specific Risk Level.

The risk level of the Rio Mesa Solar Electric Generating Facility (RMSEGF) project is determined using of the Risk Determination Worksheet contained in Appendix 1 of the 2009 Construction General Permit Order.

Step 1: Determine Sediment Risk via Option 1 (GIS Map Method - EPA Rainfall Erosivity Calculator & GIS map)

Under Option 1, the Rainfall Erosivity Factor (R) for Rio Mesa site is determined to be 19.14, with the aid of the EPA online Erosivity Index Calculator (accessed at web link http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm) as shown in the following page. The start date of earth disturbance is June 30, 2013 based on schedule start of the earthwork activities for the first unit. The end date of March 30, 2015 for final site stabilization is conservatively tied to the start of commercial operation for the third (last) unit. The latitude (33.4595^{o} N) and longitude (114.7833^{o} W) of the existing radio tower on site is used to represent the facility location.

The soil erodibility factor (K) is estimated to be 0.14 and the product of hillslope length (L) and gradient (S), i.e., LS, for the RMSEGF site is estimated to be 0.202 from the GIS maps published by the State Regional Water Quality Control Board as shown in the figures below.

The watershed erosion estimate or soil loss can be determined by multiplying the R factor and the product of K and LS factors (i.e., the RKLS factor), which is found to be 5.41 tons per acre. The site Sediment Risk Factor is therefore determined to be LOW because the estimated soil loss of 5.41 tons per acre is less than 15 tons per acre, as shown in the Sediment Risk Factor worksheet below.

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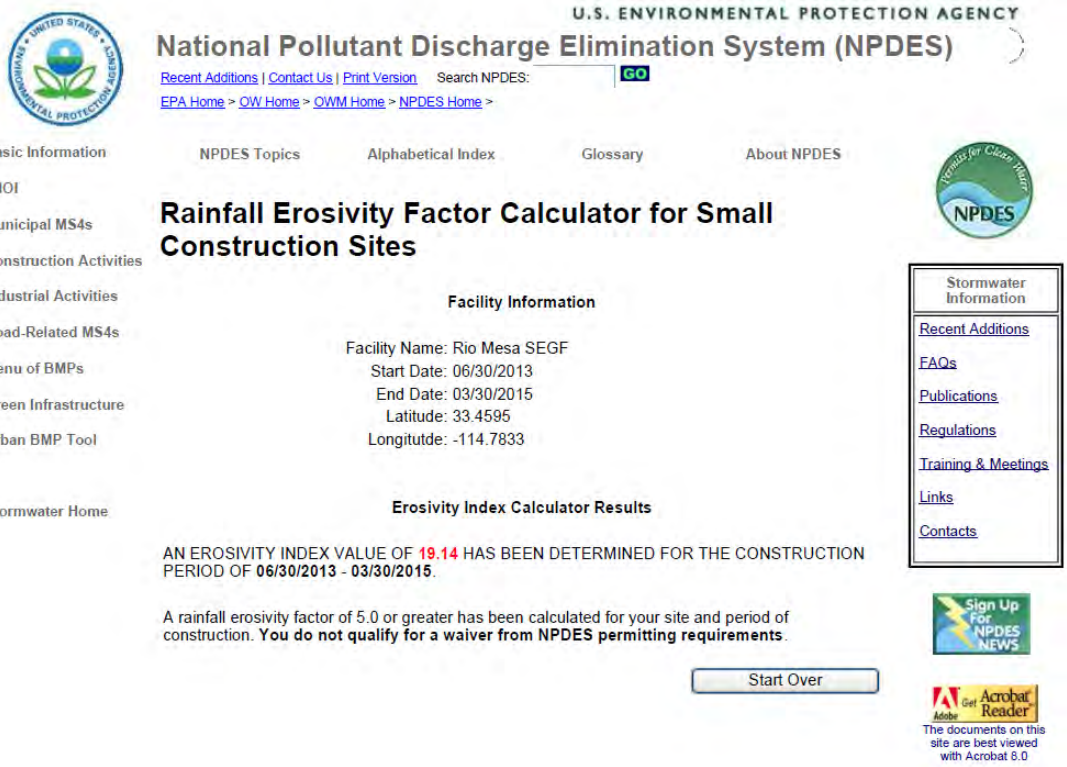

U.S. ENVIRONMENTAL PROTECTION AGENCY

National Pollutant Discharge Elimination System (NPDES)

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Urban BMP Tool

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Rainfall Erosivity Factor Calculator for Small Construction Sites

Facility Information

Facility Name: Rio Mesa SEGF
Start Date: 06/30/2013
End Date: 03/30/2015
Latitude: 33.4595
Longitutde: -114.7833

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF **19.14** HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF **06/30/2013 - 03/30/2015**.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do not qualify for a waiver from NPDES permitting requirements**.

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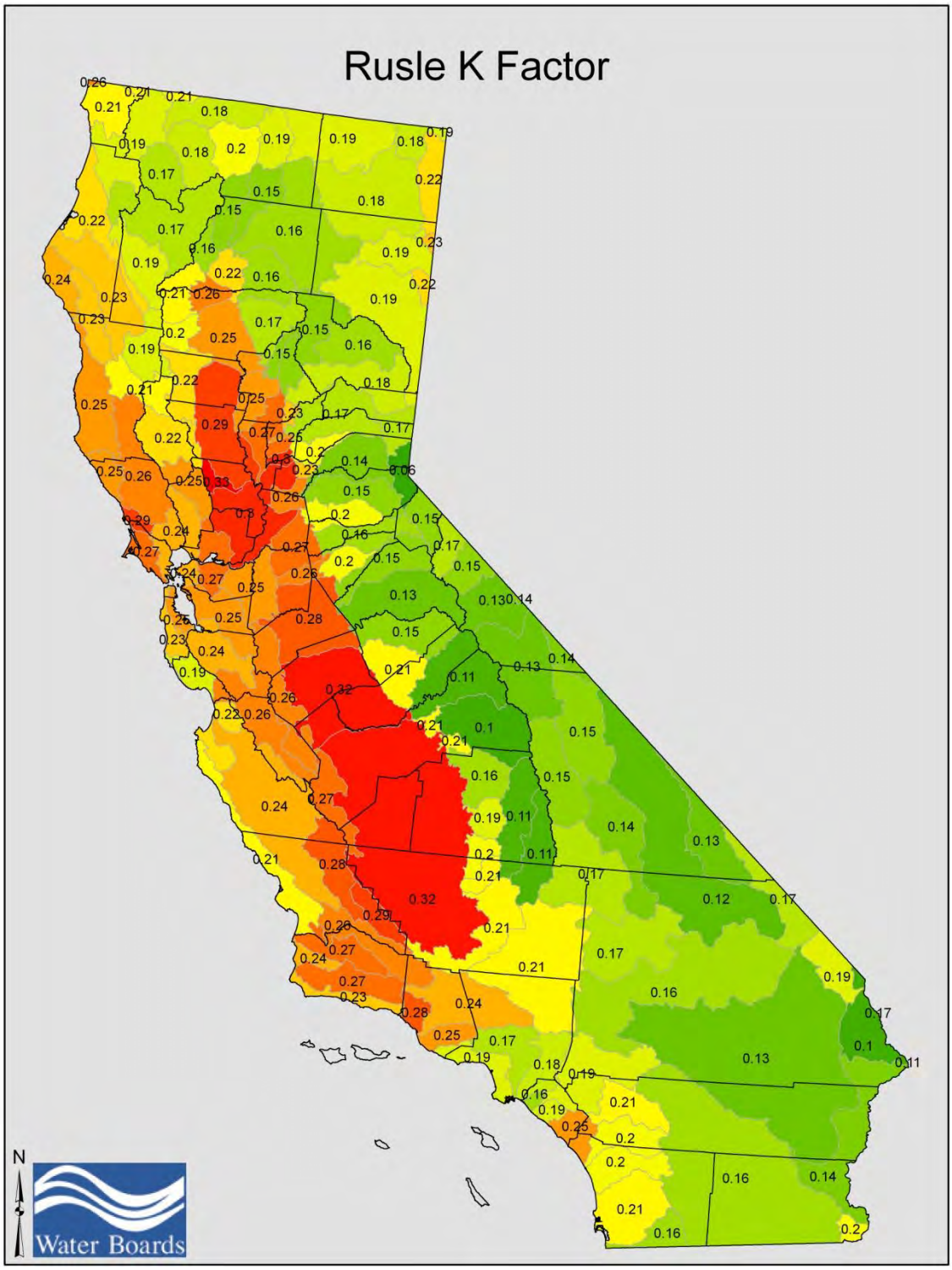

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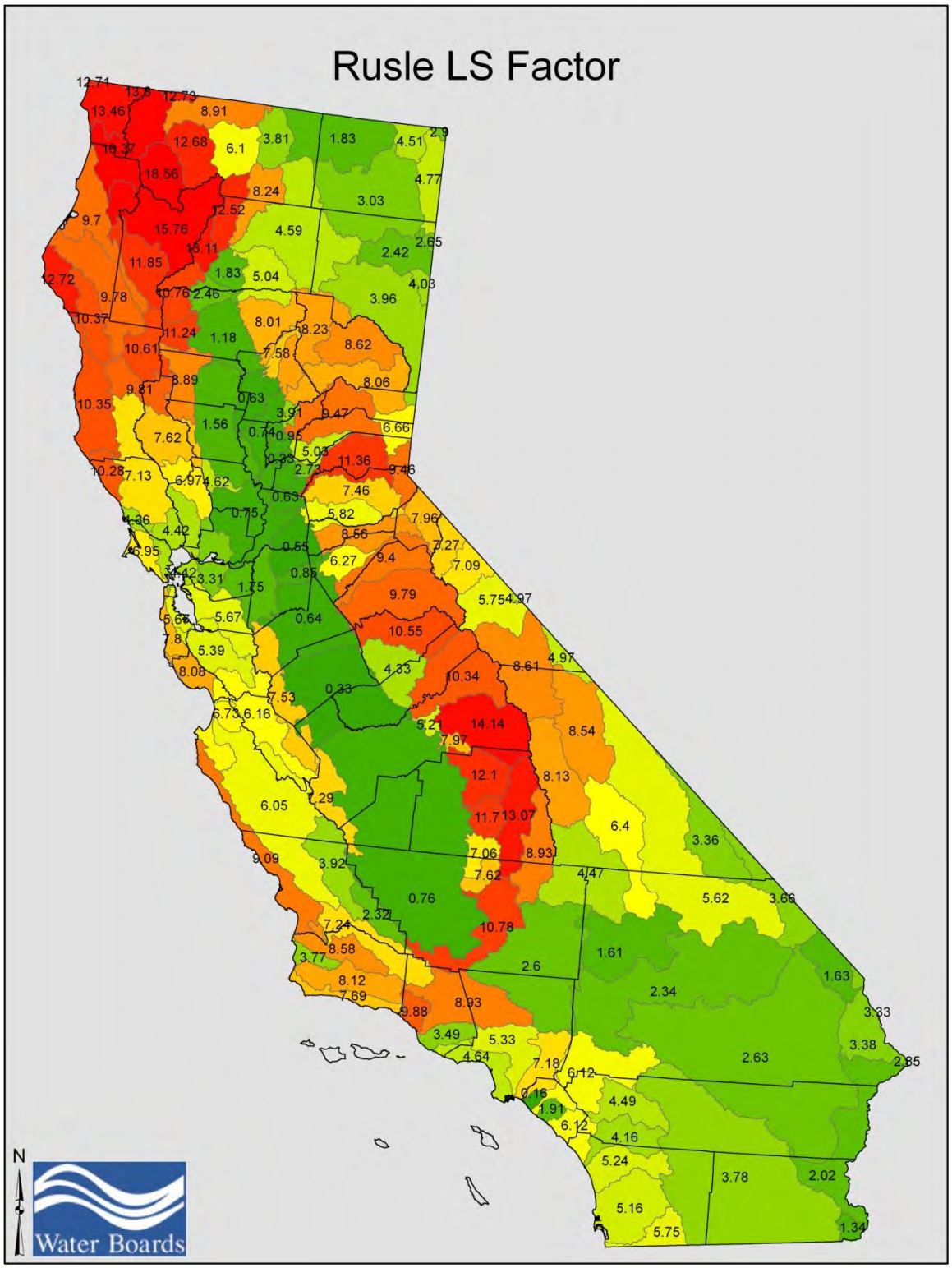

ut Bechtel's

	A	B	C
1	**Sediment Risk Factor Worksheet**		**Entry**
2	**A) R Factor**		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
5	**R Factor Value**		19.14
6	**B) K Factor (weighted average, by area, for all site soils)**		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	Site-specific K factor guidance		
9	**K Factor Value**		0.14
10	**C) LS Factor (weighted average, by area, for all slopes)**		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	LS Table		
13	**LS Factor Value**		2.02
14			
15	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**		5.41
16	**Site Sediment Risk Factor**		
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		**Low**
19	High Sediment Risk: >= 75 tons/acre		
20			

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Step 2: Determine Receiving Water Risk using the list of Sediment Sensitivity Watersheds provided

According to the latest list of sediment-impaired watersheds provided in the worksheet, the disturbed areas of the RMSEGF project site as well as the planning watershed where the site is located will not discharge (either directly or indirectly) to a 303(d)-listed waterbody impaired by sediment. In addition, the disturbed area of the RMSEGF project site will not discharge to any waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY. This finding is consistent with the Receiving Water Risk GIS map published by the State Regional Water Quality Control Board. Consequently, the Receiving Water (RW) Risk Factor is determined as LOW as shown in the table below.

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
A. Watershed Characteristics	yes/no	
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment**? For help with impaired waterbodies please check the attached worksheet or visit the link below:	No	Low
2006 Approved Sediment-impared WBs Worksheet		
http://www.waterboards.ca.gov/water_issues/programs/tmdl/303d_lists2006_epa.shtml		
OR		
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY?		
http://www.ice.ucdavis.edu/geowbs/asp/wbquse.asp		

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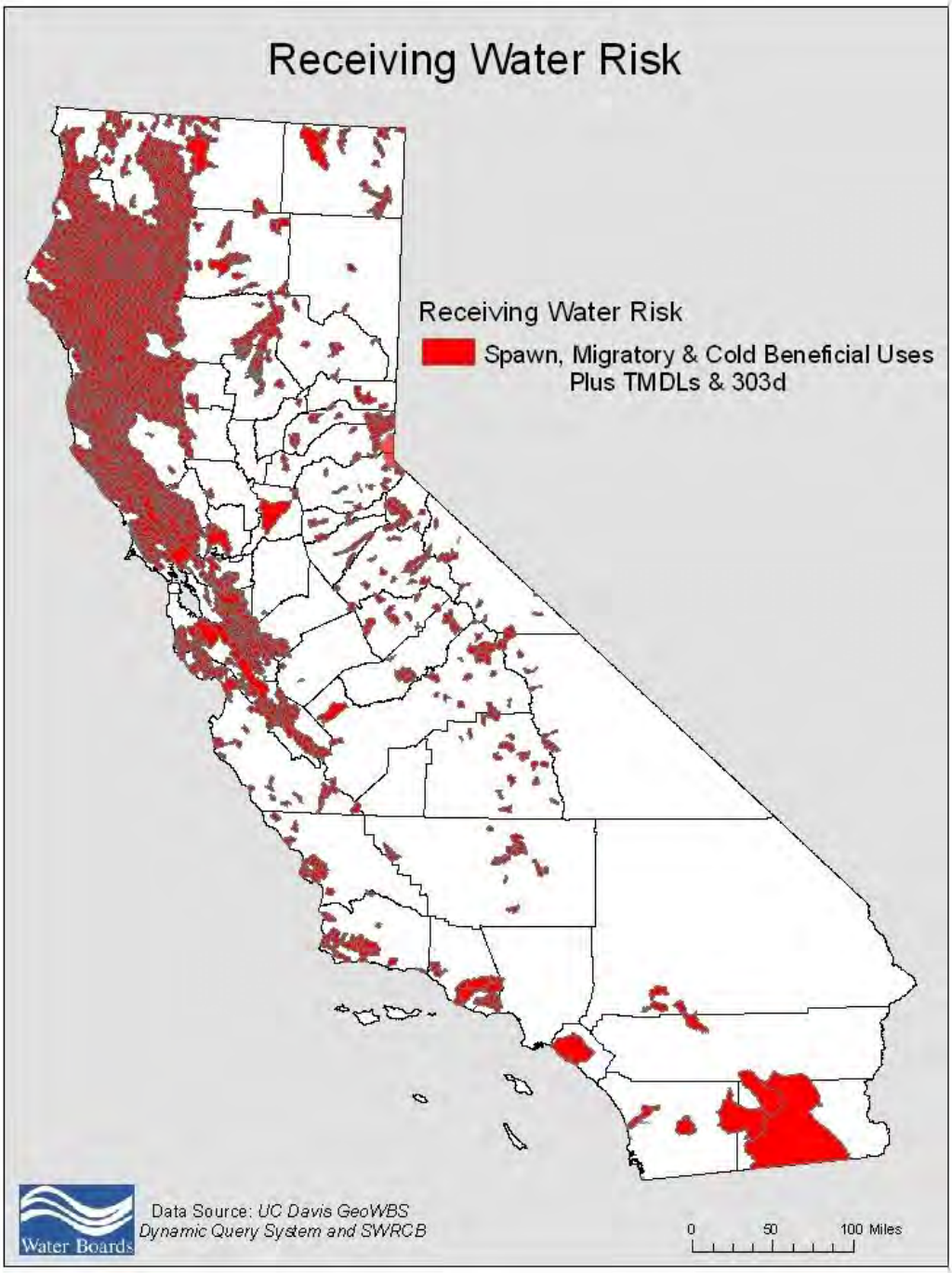

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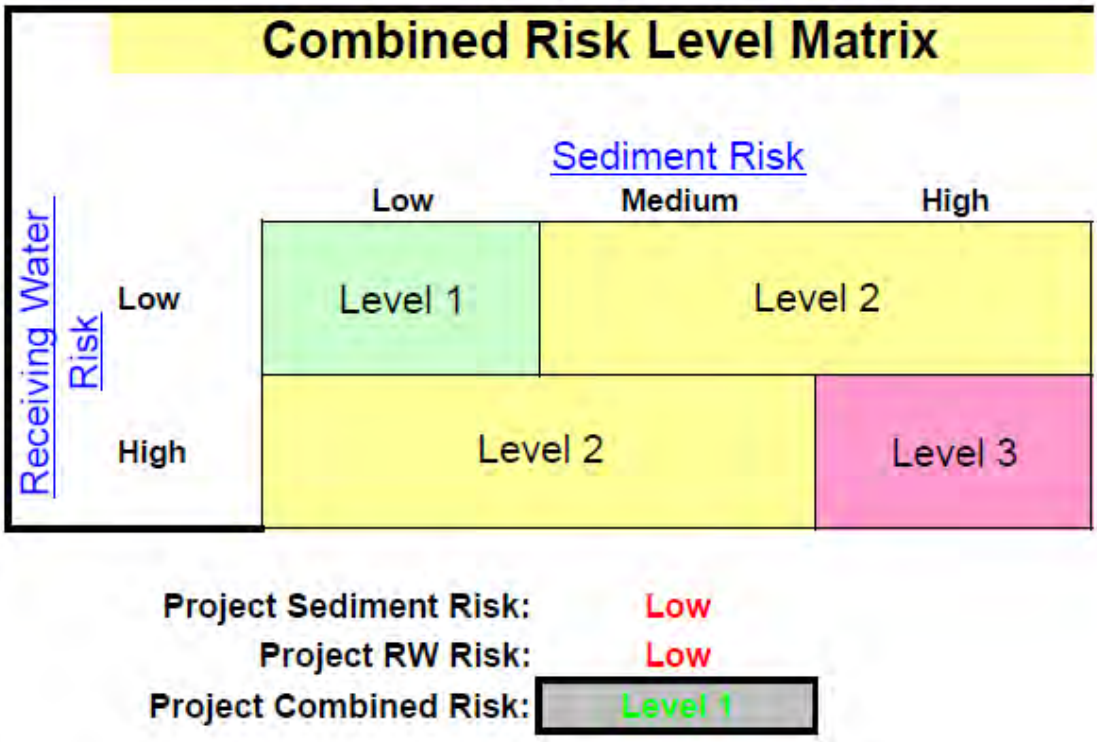
Step 3: Determine Combined Risk Level

With the assessment of low risk on both sediment transport and receiving water, the combined risk for the RMSEGF project is determined to be Level 1.



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Hydraulic Analysis

Technical Memoranda (TM):

- Technical Memorandum by VTN, dated August 31, 2011, Subject –Rio Mesa Solar – Final Post Construction Hydrologic & Hydraulic Analysis"

  This TM evaluates the hydrologic condition of the post-construction project condition and determines the difference in runoff volume and peak flow between the existing condition and the post-construction condition. In summary the existing condition hydrologic analysis has been modified in the following manner to model the post-construction condition: the curve numbers have been adjusted to account (i) for the proposed graded and paved roads within the site and around the perimeter (ii) for the proposed buildings/structures and power block areas within the site and (iii) for the proposed mirrors within the site. Based upon the runoff volume calculated in the post-construction condition (100-yr storm event), the difference in post-construction runoff volume and existing condition runoff volume is less than 2 percent (increase). All other storm events have smaller percent increases. Based on the minor increase in runoff, the development of this site should not have a negative impact on any downstream properties.

- Technical Memorandum by VTN, dated July 6, 2011, Subject –Rio Mesa Solar – Overall Existing Condition Hydrologic & Hydraulic Analysis"

  The objective of this TM is to provide a description of the existing condition flow patterns and storm water runoff for the proposed solar field site.

- Technical Memorandum by VTN, dated September 1, 2011, Subject –Rio Mesa Solar – 90% Erosion, Scour, and Sediment Transport Analysis"

  This TM describes the methodology and calculations utilized to evaluate sediment transport and to estimate the potential scour at the heliostats.

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Water Pollution Control Drawings (WPCDs)

Figure 1 - 25670-000-C2-0000-00002-00A Vicinity Map
Figure 2 - 25670-000-C2-0000-00001-00D Site Plan
Figure 3 - 25670-000-C2-0010-00001-00A Rio Mesa Unit 1 Fencing Plan
Figure 4 - 25670-000-C2-0010-00002-00A Rio Mesa Unit 1 Area (Part) and Common Area Fencing Plan
Figure 5 - 25670-000-C2-0010-00003-00A Rio Mesa Unit 2 Fencing Plan
Figure 6 - 25670-000-C2-0010-00004-00A Rio Mesa Unit 3 Fencing Plan
Figure 7 - 25670-001-C2-0010-00001-00B Construction Facilities Layout Arrangement Unit 1
Figure 8 - 25670-009-C2-0010-00001-00B Construction Facilities Layout Arrangement Common Area
Figure 9 - Topographic Map Exhibit
Figure 10 – 25670-000-CG-0090-00001-00A Grading & Surfacing Details For Ephemeral Wash Crossings
Figure 11 - 25670-001-CG-0010-00001-00A Unit 1 Rough Grading and Drainage Plan
Figure 12 - 25670-002-CG-0010-00001-00A Unit 2 Rough Grading and Drainage Plan
Figure 13 - 25670-003-CG-0010-00001-00A Unit 3 Rough Grading and Drainage Plan
Figure 14 - 25670-009-CG-0010-00001-00A Common Area Rough Grading Plan
Figure 15 - 25670-001-CE-0010-00001-00A Unit 1 Erosion & Sediment Control Plan
Figure 16 - 25670-002-CE-0010-00001-00A Unit 2 Erosion & Sediment Control Plan
Figure 17 - 25670-003-CE-0010-00001-00A Unit 3 Erosion & Sediment Control Plan
Figure 18 - 25670-009-CE-0000-00001-00A Common Area Erosion & Sediment Control Plan
Figure 19 - 25670-000-C0-0090-00001-00A Site Work Sheet 1 – Notes, Legend & Details
Figure 20 - 25670-000-C0-0090-00002-00A Site Work Sheet 2 – Erosion & Sediment Control Sections & Details
Figure 21 - 25670-000-C0-0090-00003-00A Site Work Sheet 3 – Typical Fencing Sections & Details
Figure 22 - 25670-000-C0-0090-00004-00A Site Work Sheet 4 – Typical Grading & Surfacing Details
Figure 23 - 25670-000-C0-0090-00005-00A Site Work Sheet 5 – Typical Grading & Surfacing Details
Figure 24 - 25670-000-C0-0090-00006-00A Site Work Sheet 6 – Typical Fencing Sections & Details
Figure 25 - 25670-009-C2-0090-00010-00A Main Access Road 34th Ave. Entrance Sta 0+00 to Sta 23+00
Figure 26 - 25670-009-C2-0090-00011-00A Main Access Road 34th Ave. Entrance Sta 23+00 to Sta 47+00
Figure 27 - 25670-009-C2-0090-00012-00A Main Access Road 34th Ave. Entrance Sta 47+00 to Sta 69+60
Figure 28 - 25670-009-C2-0090-00013-00A Main Access Road 34th Ave. Entrance Sta 69+60 to Sta 89+00
Figure 29 - 25670-009-C2-0090-00014-00A Main Access Road 34th Ave. Entrance Sta 89+00 to Sta 99+00
Figure 30 - 25670-001-CS-0010-00001-00A Unit 1 Paving Plan
Figure 31 - 25670-002-CS-0010-00001-00A Unit 2 Paving Plan
Figure 32 - 25670-003-CS-0010-00001-00A Unit 3 Paving Plan
Figure 33 - 25670-009-CS-0010-00001-00A Common Area Paving Plan

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Appendix C SWPPP Amendment Verifications

This SWPPP shall be amended:

- Whenever there is a change in construction or operations which may affect the discharge of pollutants to surface waters, groundwater(s), or a municipal separate storm sewer system (MS4); or
- If any condition of the Permit is violated or the general objective of reducing or eliminating pollutants in stormwater discharges has not been achieved. If the RWQCB determines that a Permit violation has occurred, the SWPPP shall be amended and implemented within 14-calendar days after notification by the RWQCB;
- Annually, prior to the defined rainy season; and
- When deemed necessary by the Owner (i.e., Rio Mesa Partners I, II, III, LLC) and/or Contractor Developer (Bechtel Power Corporation).

The following items will be included in each amendment:

- Who requested the amendment.
- The location of proposed change.
- The reason for change.
- The original BMP proposed, if any.
- The new BMP proposed.

The amendments for this SWPPP, along with the QSD Certification, can be found in the following pages. Amendments are listed in the following Amendment Log

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SWPPP Amendment No.

Project Name: Rio Mesa SEGF

Project Number: Not applicable

Preparer Certification of the
Stormwater Pollution Prevention Plan Amendment

~~I~~certify under a penalty of law that I will have, upon receiving appropriate QSD certification training by 9/2/2011, appropriate QSD qualifications and that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that QSP and properly trained delegates gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

_____	_____
Qualified SWPPP Developer Signature	Date
Dr. Kit Ng, Assistant Chief G&HES	
California Professional Engineer (Civil) No. 51065	301-228-7652__
QSD Name and Title	Telephone Number

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Amendment Log

Project Name: Rio Mesa SEGF

Project Number: Not applicable

Example:

Amendment No.	Date	Brief Description of Amendment	Prepared By

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Appendix D Submitted Changes to PRDS

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Appendix E Construction Schedule

Construction of RMSEGF from site preparation and grading to commercial operation is expected to take place from the fourth quarter of 2010 to the end of 2013, a total of 33 months approximately. Commercial operations of all three units are expected to commence in 2013.

Major milestones are listed in Table F-1. Table F-2 lists the anticipated project schedule during the initial stages of Phase 1 work. Additional detailed project schedule for later phases of the project will be provided as necessary.

TABLE F-1 Project Schedule Major Milestones

Activity	Date
Mobilization	7/1/2013
Installation of initial sediment & erosion control measures	6/30/2013
Rio Mesa 1 Commercial Operation	9/30/2015
Rio Mesa 2 Commercial Operation	12/30/2015
Rio Mesa 3 Commercial Operation	3/30/2016

TABLE F-2 Anticipated Initial Phase Project Schedule

Construction Activities	Schedule
Surveying (Stake Marking/Monuments)	TBD
Mobilization and Start of Field Works	TBD
Removal of Sensitive Plants at Project Boundary (if applicable)	TBD
Installation of Silt Fencing	TBD
Clearing and Grubbing	TBD
Perimeter Fence (Tortoise/Combo) Installation	TBD
Established Plant Access Road	TBD
Cut and Fill – Rough Grading Common Area including Flood Diversion Control	TBD
Installation of Water Wells	TBD
Establish Site Office Complex	TBD
Installation of Foundations/Underground Utilities – Common Area	TBD
Cut and Fill – Rough Grading Power Block and Flood Diversion Control	TBD
Establish Permanent Flood Diversion Berms and Channels	TBD
Develop Dirt Roads in Solar Field	TBD
Installation of Foundations/Underground	TBD

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Construction Activities	Schedule
Utilities – Power Block	
Installation of Solar Field Pylons	TBD
Final Grading – Power Block and Common Area	TBD
Rio Mesa 1 Performance Testing	TBD
Demobilization – Rio Mesa 1	TBD

Construction will generally be scheduled to occur between 5:00 a.m. and 7:00 p.m. Additional hours may be necessary to make up schedule deficiencies, or to complete critical construction activities (e.g., pouring concrete at night during hot weather, working around time-critical shutdowns and constraints). During some construction periods and during the startup phase of the project, some activities may continue 24 hours per day, 7 days per week.

The following sections describe the major construction work processes.

Mobilization

The selected Contractor will mobilize and develop temporary construction facilities and laydown areas adjacent to the power block and the common area. Before starting the clearing and grading, the sediment and erosion control measures will be placed on site. Clearing and grubbing will start in the power block area.

Heliostat Erection

Solar field erection works will require at least two pre-assembly sheds for assembling heliostat structures. Approximately 85,000 heliostats will need to be installed in each Rio Mesa unit. Fabrication buildings will be used to assemble heliostats during all three construction phases. Once construction of Rio Mesa 3 is completed, the buildings will be removed and the area restored.

Power Block and Towers

Concrete, mechanical and electrical works of the power block will be performed after the immediate area is brought to its designated grade elevations.

The Common Area, located on the east boundary of the project site between Rio Mesa 2 and 3, will be used for the fabrication sheds and construction parking. It can be used for construction laydown, if necessary. However, temporary laydown of materials at each site will generally occur in the vicinity of active construction work.

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Appendix G CASQA BMP Handbook Fact Sheets

Attached are the BMP Fact Sheets from the California Stormwater BMP Handbook, Construction, for those BMPs selected for use on the Rio Mesa Solar Electric Generating Facility Project.

Document Number	California Stormwater Best Management Practice Handbook
TBD	NS-1 Water Conservation Practices
TBD	NS-2 Dewatering Operations
TBD	NS-3 Paving and Grinding Operations
TBD	NS-8 Vehicle and Equipment Cleaning
TBD	NS-9 Vehicle and Equipment Fueling
TBD	NS-10 Vehicle and Equipment Maintenance
TBD	NS-12 Concrete Curing
TBD	EC-1 Scheduling
TBD	EC-2 Preservation and Existing Vegetation
TBD	EC-7 Geotextiles and Mats
TBD	EC-9 Earth Dikes and Drainage Swales
TBD	EC-10 Velocity and Dissipation Devices
TBD	SE-1 Silt Fence
TBD	SE-4 Check Dams
TBD	SE-5 Fiber Rolls
TBD	SE-7 Street Sweeping and Vacuuming
TBD	TC-1 Stabilized Construction Entrance/Exit
TBD	TC-2 Stabilized Construction Roadway
TBD	TC-3 Entrance/Outlet Tire Wash
TBD	WE- 1 Wind Erosion Control
TBD	WM-1 Material Delivery and Storage
TBD	WM-2 Material Use
TBD	WM-3 Stockpile Management
TBD	WM-4 Spill Prevention and Control
TBD	WM-5 Solid Waste Management
TBD	WM-6 Hazardous Waste Management
TBD	WM-7 Contaminated Soil Management
TBD	WM-8 Concrete Waste Management

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Document Number	California Stormwater Best Management Practice Handbook
TBD	WM-9 Sanitary/Septic Waste Management
TBD	WM-10 Liquid Waste Management

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Appendix H Construction Site Inspection Report Form

GENERAL INFORMATION				
Project Name	Rio Mesa Solar Electric Generating Facility Project			
Project Location	NA / Riverside County, Blythe, CA			
Contractor	Bechtel Power Corporation			
Inspector's Name				
Inspector's Title				
Signature				
Date of Inspection				
Inspection Type (Check Applicable)	❒ Prior to forecast rain		❒ After a rain event	
	❒ 24-hr intervals during extended rain		❒ Other _____	
Season (Check Applicable)	❒ Rainy		❒ Non-Rainy	
Storm Data	Storm Start Date & Time:		Storm Duration (hrs):	
	Time elapsed since last storm (Circle Applicable Units)	Min. Hr. Days	Approximate Rainfall Amount (inches)	

PROJECT AREA SUMMARY AND DISTURBED SOIL AREA (DSA) SIZE		
Total Project Area	_____	Acres
Field Estimate of Active DSAs	_____	Acres
Field Estimate of Non-Active DSAs	_____	Acres

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INSPECTION OF BMPs				
BMP	**Yes**	**No**	**N/A**	**Corrective Action**
Preservation of Existing Vegetation				
Is temporary fencing provided to preserve vegetation in areas where no construction activity is planned?				
Location:				
Location:				
Location:				
Location:				
Erosion Control				
Does the applied temporary erosion control provide 100% coverage for the affected areas?				
Are any non-vegetated areas that may require temporary erosion control?				
Is the area where erosion controls are used required free from visible erosion?				
Location:				
Location:				
Location:				
Location:				
Temporary Linear Sediment Barriers (Silt Fence, Fiber Rolls, Sandbag Barriers, etc.)				
Are temporary linear sediment barriers properly installed, functional and maintained?				
Are temporary linear sediment barriers free of accumulated litter?				
Is the built-up sediment less than 1/3 the height of the barrier?				
Are cross barriers installed where necessary and properly spaced?				
Location:				
Location:				
Location:				
Location:				
Location:				
Storm Drain Inlet Protection				
Are storm drain inlets internal to the project properly protected?				
Are storm drain inlet protection devices in working order and being properly maintained?				
Location:				
Location:				
Location:				

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INSPECTION OF BMPs				
Location:				
Location:				
Sediment Basins				
Are basins designed in accordance with the requirements of the General Permit?				
Are basins maintained to provide the required retention/detention?				
Are basin controls (inlets, outlets, diversions, weirs, spillways, and racks) in working order?				
Location:				
Location:				
Location:				
Location:				
Stockpiles				
Are all locations of temporary stockpiles, including soil, hazardous waste, and construction materials in approved areas?				
Are stockpiles protected from run-on, run-off from adjacent areas and from winds?				
Are stockpiles located at least 15 m from concentrated flows, downstream drainage courses and storm drain inlets?				
Are required covers and/or perimeter controls in place?				
Location:				
Location:				
Location:				
Location:				
Concentrated Flows				
Are concentrated flow paths free of visible erosion?				
Location:				
Location:				
Location:				
Location:				
Tracking Control				
Is the entrance stabilized to prevent tracking				
Is the stabilized entrance inspected daily to ensure that it is working properly				
Are points of ingress/egress to public/private roads inspected and swept and vacuumed as needed?				
Are all paved areas free of visible sediment tracking or other particulate matter?				
Location:				

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INSPECTION OF BMPs				
Location:				
Location:				
Location:				
Wind Erosion Control				
Is dust control implemented?				
Location:				
Location:				
Location:				
Location:				
Dewatering Operations				
Are all one-time dewatering operations covered by the General Permit inspected before and as they occur and BMPs implemented as necessary during discharge?				
Is ground water dewatering handled in conformance with the dewatering permit issued by the RWQCB?				
Is required treatment provided for dewatering effluent?				
Location:				
Location:				
Location:				
Location:				
Vehicle & Equipment Fueling, Cleaning, and Maintenance				
Are vehicle and equipment fueling, cleaning and maintenance areas reasonably clean and free of spills, leaks, or any other deleterious material?				
Are vehicle and equipment fueling, cleaning and maintenance activities performed on an impermeable surface in dedicated areas?				
If no, are drip pans used?				
Are dedicated fueling, cleaning, and maintenance areas located at least 15 m away from downstream drainage facilities and watercourses and protected from run-on and runoff?				
Is wash water contained for infiltration/ evaporation and disposed of appropriately?				
Is on-site cleaning limited to washing with water (no soap, soaps substitutes, solvents, or steam)?				
On each day of use, are vehicles and equipment inspected for leaks and if necessary, repaired?				
Location:				
Location:				
Location:				

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INSPECTION OF BMPs				
Location:				
Waste Management & Materials Pollution Control				
Are material storage areas and washout areas protected from run-on and runoff, and located at least 15 m from concentrated flows and downstream drainage facilities?				
Are all material handling and storage areas clean; organized; free of spills, leaks, or any other deleterious material; and stocked with appropriate clean-up supplies?				
Are liquid materials, hazardous materials, and hazardous wastes stored in temporary containment facilities?				
Are bagged and boxed materials stored on pallets?				
Are hazardous materials and wastes stored in appropriate, labeled containers?				
Are proper storage, clean-up, and spill-reporting procedures for hazardous materials and wastes posted in open, conspicuous and accessible locations adjacent to storage areas?				
Are temporary containment facilities free of spills and rainwater?				
Are temporary containment facilities and bagged/boxed materials covered?				
Are temporary concrete washout facilities designated and being used?				
Are temporary concrete washout facilities functional for receiving and containing concrete waste and are concrete residues prevented from entering the drainage system?				
Do temporary concrete washout facilities provide sufficient volume and freeboard for planned concrete operations?				
Are concrete wastes, including residues from cutting and grinding, contained and disposed of off-site or in concrete washout facilities?				
Are spills from mobile equipment fueling and maintenance properly contained and cleaned up?				
Is the site free of litter?				
Are trash receptacles provided in the yard, field trailer areas, and at locations where workers congregate for lunch and break periods?				
Is litter from work areas collected and placed in watertight dumpsters?				
Are waste management receptacles free of leaks?				
Are the contents of waste management receptacles properly protected from contact with storm water or from being dislodged by winds?				
Are waste management receptacles filled at or beyond capacity?				
Location:				
Location:				
Location:				
Location:				

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INSPECTION OF BMPs				
Temporary Water Body Crossing or Encroachment				
Are temporary water body crossings and encroachments constructed appropriately?				
Does the project conform to the requirements of the 404 permit and/or 1601agreement?				
Location:				
Location:				
Location:				
Location:				
Illicit Connection/ Discharge				
Is there any evidence of illicit discharges or illegal dumping on the project site?				
If yes, has the Owner/Operator been notified?				
Location:				
Location:				
Location:				
Location:				
Discharge Points				
Are discharge points and discharge flows free from visible pollutants?				
Are discharge points free of any significant sediment transport?				
Location:				
Location:				
Location:				
Location:				
SWPPP Update				
Do the SWPPP and Project Schedule adequately reflect the current site conditions and contractor operations?				
Are all BMPs shown on the water pollution control drawings installed in the proper location(s) and according to the details in the SWPPP?				
Location:				
Location:				
Location:				
Location:				
General				
Are there any other potential concerns at the site?				
Location:				

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INSPECTION OF BMPs				
Location:				
Location:				
Location:				
Storm Water Monitoring				
Does storm water discharge directly to a water body listed in the General Permit as impaired for sediment/sedimentation or turbidity?				
If yes, were samples for sediment/sedimentation or turbidity collected pursuant to the sampling and analysis plan in the SWPPP?				
Did the sampling results indicate that the discharges are causing or contributing to further impairment?				
If yes, were the erosion/sediment control BMPs improved or maintained to reduce the discharge of sediment to the water body?				
Were there any BMPs not properly implemented or breaches, malfunctions, leakages or spills observed which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water?				
If yes, were samples for non-visually detectable pollutants collected pursuant to the sampling and analysis plan during rain events?				
If sampling indicated pollution of the storm water, were the leaks, breaches, spills, etc. cleaned up and the contaminated soil properly disposed of?				
Were the BMPs maintained or replaced?				
Were soil amendments (e.g., gypsum, lime) used on the project?				
If yes, were samples for non-visually detectable pollutants collected pursuant to the sampling and analysis plan in the SWPPP?				
If sampling indicated pollution of the storm water by the use of the soil amendments, is there a contingency plan for retention onsite of the polluted storm water?				
Did storm water contact stored materials or waste and run off the construction site? (Materials not in watertight containers, etc.)				
If yes, were samples for non-visually detectable pollutants collected pursuant to the sampling and analysis plan in the SWPPP?				

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Appendix I Training Reporting Form

Storm Water Management Training Log

Project Name: Rio Mesa Solar Electric Generating Facility Project

Project Number/Location: NA / Riverside County, Blythe, CA

Storm Water Management Topic: (check as appropriate)

- ❑ Erosion Control
- ❑ Sediment Control
- ❑ Wind Erosion Control
- ❑ Tracking Control
- ❑ Non-storm water management
- ❑ Waste Management and Materials Pollution Control
- ❑ Storm Water Sampling

Specific Training Objective: _____

Location: _____ Date: _____

Instructor: _____ Telephone: _____

Course Length (hours): _____

Attendee Roster (attach additional forms if necessary)

Name	Company	Phone

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Name	Company	Phone

Comments

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Appendix J Responsible Parties

List of Responsible Individuals

Name/Company	Responsibility	Phone Number	Address	Date of Training	Date of Recorded Entry
TBD	Site Manager	TBD	5275 Westview Drive Frederick, MD 21703	Pending	
Dr. Kit Ng	Qualified SWPPP Developer (QSD)	301-228-7652	5275 Westview Drive Frederick, MD 21703	Professional Engineer (Civil No. 51065 - California	
TBD	Qualified SWPPP Practitioner (QSP)	TBD	TBD	TBD	
TBD	Project Field Engineer	TBD	5275 Westview Drive Frederick, MD 21703	Pending	
Peter Carr/Bechtel	Project Environmental Lead	301-349-2040 240-344-0897	5275 Westview Drive Frederick, MD 21703	Pending	

Training Certificates & Verification of Training

See attached.

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Appendix K Subcontractors

SUBCONTRACTOR LOG
(QSP Direction)

Project Name: Rio Mesa Solar Electric Generating Facility Project

Project Number/Location: NA / Riverside County, Blythe, CA

SUBCONTRACTOR COMPANY NAME	CONTACT NAME	ADDRESS	PHONE NUMBER	CELL OR FIELD PHONE	DATE NOTIFICATION LETTER SENT	TYPE OF WORK

USE ADDITIONAL PAGES AS NECESSARY

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Appendix L Construction Site Monitoring Program

The specific monitoring required for RMSEGF Project can be defined by its status as Risk Level 1 site and by its lack of sediment basins. The California Handbook (2011) Tables D-2 for Risk Level 1 indicates that the following applicable monitoring requirements.

Table L-1 Monitoring Requirements

Type of Monitoring		When
Sampling & Analysis	Non-visible pollutants: spill/BMP failure based on pollutant source assessment	Within first two hours of discharge from site. Collect samples of runoff affected by the spilled or released material(s) and runoff that is unaffected by the spilled or released material(s).
Visual Inspections	Non-stormwater inspection	Quarterly for each drainage area.
	Qualifying rain event: Pre-rain inspection	All drainage areas, BMPs, and stormwater containments within two business days of each qualifying rain event.
	Qualifying rain event: Post-rain inspection	All discharge locations within two business days after each qualifying rain event. Visually observe discharge of contained stormwater when discharged.
	During rain inspection	See BMP inspection below.
	BMP	Weekly and every 24 hours during extended storm events.

Monitoring Locations

Monitoring and sampling locations will be based on proximity to planned non-visible pollutant storage, occurrence, or use; accessibility for sampling; personnel safety; and other factors in accordance with the applicable requirements in the General Permit.

- Sampling locations have been identified for the collection of runoff samples from material storage areas with spill potential.
- Power block drainage outlets – downstream of the oil water separators
- A location has been identified for the collection of an uncontaminated sample of runoff as a background sample for comparison with the samples being analyzed for non-visible pollutants. This location was selected such that the sample will not have come in contact with operational or storage areas associated with the materials, wastes, and activities identified or disturbed soils areas.

If an operational activity or stormwater inspection conducted 48 hours prior to or during a rain event identifies the presence of a material storage, waste storage, or operations area with spills or the potential for the discharge of non-visible pollutants to surface waters that was an unplanned location and has not been identified on the WPCDs in Appendix B, sampling locations will be selected using the same rationale as that used to identify planned locations.

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Safety

The primary safety concerns are with related to lightning from the thunderstorms (a primary source of rainfall) and from the potentially significant storm water flowing through existing ephemeral drainage pathways during rain events. Stormwater runoff at the site is predominantly sheet flow from west to east, eventually discharging into Pal Verde Mesa region. With exception of the immediate areas near the power blocks, substation, and the common administrative area, the general pre-development drainage and flood flow patterns will be maintained – much of this flow follows ephemeral washes. Water levels can rise quickly in these step-sided washes, presenting risks to sampling activities conducted in these areas during storm events.

Visual Monitoring

Risk Level 1 sites are required to conduct visual monitoring (inspections). Visual monitoring includes inspections of BMPs, inspections before and after qualifying rain events, and inspection for non-stormwater discharges. Visual inspections are required for the duration of the project with the goal of confirming that appropriately selected BMPs have been implemented, are being maintained, and are effective in preventing potential pollutants from coming in contact with stormwater.

BMP Inspections

The General Permit requires that BMPs be inspected weekly and once each 24-hour period during extended storm events. The purpose of these inspections is to identify BMPs that:

- Need maintenance to operate effectively;
- Failed; or
- Could fail to operate as intended.

If deficiencies are identified during BMP inspections, repairs or design changes to BMPs will be initiated within 72 hours of identification and completed as soon as possible.

All BMP inspections will be documented on an inspection checklist. The checklist includes:

- Inspection date and date the inspection report was written;
- Weather information, including presence or absence of precipitation, estimate of the beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches;
- Site information, including stage of construction, activities completed, and approximate area of the site exposed;
- A description of the BMPs evaluated and any deficiencies noted;
- If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-stormwater controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations, and identify any projected maintenance activities;
- Report the presence of noticeable odors or any visible sheen on the surface of any dischargers;

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- Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates;
- Photographs taken during the inspection, if any; and
- Inspector's name, title, and signature.

Qualifying Rain Event Inspections

The construction site be inspected within two days prior to a predicted qualifying rain event (50% probability National Weather Service forecast) is and within two days after a qualifying rain event (1/2 inch or more of precipitation within a ≥48 hour period between events). These inspections will be performed during normal business hours of the construction site.

The pre-rain event inspection addresses:

- All stormwater drainage areas to identify any spills, leaks, or uncontrolled pollutant sources;
- All BMPs to identify whether they have been properly implemented per the SWPPP;
- Stormwater storage and containment areas to detect leaks and ensure maintenance of adequate freeboard; and
- The presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants within stored stormwater.

The post-rain event inspection addresses:

- All stormwater discharge locations;
- The discharge of stored or contained stormwater that is derived from and discharged subsequent to a qualifying rain event; and
- All BMPs to determine if they were adequately designed, implemented, and effective.

Inspection records will document:

- Personnel performing the observations;
- Observation dates (time and date);
- Weather conditions (including the rain gauge reading for the qualifying rain event);
- Locations observed; and
- Corrective actions taken in response to observations.

The Visual Inspection Field Log Sheet is included in Attachment 1.

Non-Stormwater Inspections

The Rio Mesa site will be inspected quarterly for the presence of non-stormwater discharges. These inspections focus on identifying unauthorized non-stormwater discharges and observing authorized non-stormwater discharges.

The quarterly inspections will address the each drainage area of the project and document:

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- Presence or indications of unauthorized and authorized non-stormwater discharges and their sources;
- Pollutant characteristics of the non-stormwater discharge (floating and suspended material, sheen, discoloration, turbidity, odor, etc;
- Personnel performing the observations;
- Dates and approximate time each drainage area and non-stormwater discharge was observed; and
- Response taken to observations.

The Visual Inspection Field Log Sheet is included in Attachment 1.

Water Quality Sampling and Analysis

The sampling and analysis activities described herein are designed to determine whether the Rio Mesa BMPs are effective in controlling potential construction site pollutants. The following sections addresses the potential pollutant sources, the Risk Level 1 sampling strategy and constituents, sampling locations and handling and the associated analytical methods and laboratories.

Pollutant Sources

Per the General Permit, the Risk Level 1 sampling is limited to non-stormwater related pollutant sources. No particle size analysis will be conducted, as the site will not be employing sediment basins.

The following construction materials, wastes, or activities are potential sources of non-visible pollutants to stormwater discharges from the RMSEGF construction process.

- Vehicle batteries
- Concrete pours and curing
- Sealants
- Adhesives
- Cleaning products
- Solvents; Thinners
- Fertilizers; Herbicides
- Dust palliatives
- Soil binders
- Painting products
- Line flushing products
- Masonry products

Sampling Strategy Risk Level 1

Risk Level 1 projects like RMSEGF collect water samples for non-visible pollutants if there is (1) a breach, leakage, malfunction, or spill is observed; and (2) the leak or spill has not been cleaned up prior to the rain event; and (3) there is the potential for discharge of non-visible pollutants to surface waters or drainage system.

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In conformance with the minimum of 48 hours of dry weather will be used to distinguish between separate rain events.

Collection of discharge samples for non-visible pollutant monitoring will be triggered when any of the following conditions are observed during inspections conducted before or during rain events:

- Materials or wastes containing potential non-visible pollutants are not stored under watertight conditions. Watertight conditions are defined as (1) storage in a watertight container, (2) storage under a watertight roof or within a building, or (3) storage protected by temporary cover and containment that prevents stormwater contact and runoff from the storage area.

- Materials or wastes containing potential non-visible pollutants are stored under watertight conditions, but (1) a breach, malfunction, leakage, or spill is observed, (2) the leak or spill is not cleaned up prior to the rain event, and (3) there is the potential for discharge of non-visible pollutants to surface waters or a storm sewer system.

- An operational activity with the potential to contribute non-visible pollutants (1) was occurring during or within 24 hours prior to the rain event, (2) applicable BMPs were observed to be breached, malfunction, or be improperly implemented, and (3) there is the potential for discharge of non-visible pollutants to surface waters.

- Soil amendments that have the potential to change the chemical properties, engineering properties, or erosion resistance of the soil have been applied, and there is the potential for discharge of non-visible pollutants to surface waters.

.Sampling Locations

Sampling locations are based on proximity to planned non-visible pollutant storage, occurrence, or use; accessibility for sampling; personnel safety; and other factors in accordance with the applicable requirements in the General Permit.

- Sampling locations have been identified for the collection of runoff samples from material storage areas with spill potential.

- A location has been identified for the collection of an uncontaminated sample of runoff as a background sample for comparison with the samples being analyzed for non-visible pollutants. This location was selected such that the sample will not have come in contact with storage areas associated with the materials, wastes, and the activities identified or from disturbed soils areas.

If a construction activity or stormwater inspection conducted within two days prior to or during a qualifying rain event identifies the presence of a material storage, waste storage, or operations area with spills or the potential for the discharge of non-visible pollutants to surface waters that was an unplanned location and has not been identified on the associated Water Pollution Control Drawings, sampling locations will be selected using the same rationale as that used to identify planned locations.

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Monitoring Preparation

Samples on the project site will be collected by the following sampling personnel:

Name/Telephone Number: Lorie Palkow/TBD

Prior to the rainy season, sampling personnel and alternates will review the Construction Site Monitoring Plan.

An adequate stock of monitoring supplies and equipment for monitoring non-visible pollutants will be available on the project site prior to a sampling event. Monitoring supplies and equipment will be stored in a cool-temperature environment that will not contact rain or direct sunlight. Sampling personnel will be available to collect samples in accordance with the sampling schedule.

Supplies maintained at the project site will include surgical gloves, sample collection equipment, coolers, appropriate number and volume of sample bottles, identification labels, re-sealable storage bags, paper towels, personal rain gear, ice, Sampling Activity Log forms, and Chain of Custody (COC) forms. Field-testing instruments for analyzing samples in the field by sampling personnel will be obtained and maintained.

Safety practices for sample collection will be in accordance with the ES& H Execution Plan.

The SWPPM will contact sampling personnel 24 hours prior to a predicted rain event and if one of the triggering conditions is identified during an inspection before, during, or after a storm event. This will ensure that adequate sample collection personnel, supplies, and field test equipment for monitoring non-visible pollutants are available and mobilized to collect samples on the project site in accordance with the sampling schedule.

Analytical Constituents

Identification of Non-Visible Pollutants

Table L-2 lists specific sources and types of potential non-visible pollutants anticipated to be on the project site and the applicable water quality indicator constituent(s) for that pollutant.

TABLE L-2 Potential Non-Visible Pollutants and Water Quality Indicator Constituents

Pollutant Source	Pollutant	Water Quality Indicator Constituent
Acids and bases	pH	pH
Treated lumber	Copper, Total Chromium, Arsenic	Copper, Total Chromium, Arsenic
Concrete curing compounds	pH (Alkalinity)	pH
Lead-acid batteries	Lead, sulfates, or pH	Lead, sulfates, or pH
Cleaners	Acid, Phosphates	pH
Painting Products	Paint Strippers, Solvents, Thinners	COD

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Sample Collection and Handling

Sample Collection Procedures

Samples of discharge will be collected at the designated sampling locations for observed breaches, malfunctions, leakages, spills, operational areas, soil amendment application areas, and/or historical site usage areas that triggered the sampling event.

Grab samples will be collected and preserved in accordance with the methods identified in Table L-3. Only personnel trained in proper water quality sampling will collect samples.

TABLE L-3 Sample Collection, Preservation and Analysis for Monitoring Non-Visible Pollutants

Constituent	Analytical Method	Minimum Sample	Sample Bottle	Sample Preservation	Reporting Limit	Maximum Holding Time
COD	EPA 410.4	1 × 250 mL	Glass-amber	Store at 4° C, H_2SO_4 to pH<2	5 mg/L	28 days
pH	EPA 150.1	1 × 100 mL	Polypropylene	None	Unit less	Immediate
Alkalinity	SM 2320B	1 × 250 mL	Polypropylene	Store at 4° C	1 mg/L	14 days
Metals (Cu, As, Pb)	EPA 6010B/ 7470A	1 × 250 mL <2	Polypropylene	Store at 4° C, HNO_3 to pH	0.1 mg/L	6 months
Metals (chromium VI)	EPA 7199	1 × 500 mL	Polypropylene	Store at 4° C	1 µg/L	24 hours

Notes:

C = degree(s) Celsius µg/L = microgram(s) per Liter EPA = Environmental Protection Agency H_2SO_4 = hydrogen sulfide HNO_3 = nitric acid L = liter SM = Standard Method	mg/L = milligrams per liter mL = milliliter(s)

Samples will be collected by placing a separate lab-provided sample container directly into a stream of water down gradient and close to the potential non-visible pollutant discharge location. This separate lab-provided sample container will be used to collect water, which will be transferred to sample bottles for laboratory analysis. The up gradient and uncontaminated background samples will be collected prior to collecting the

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down gradient sample to minimize cross-contamination. Sampling personnel will collect the water up gradient of where they are standing. Once the separate lab-provided sample container is filled, the water sample will be poured directly into sample bottles provided by the laboratory for the analyte(s) being monitored.

To maintain sample integrity and prevent cross-contamination, sampling collection personnel will:

- Wear a clean pair of surgical gloves prior to the collection and handling of each sample at each location.
- Prevent the inside of the sample bottle from contacting any material other than the water sample.
- Discard sample bottles or sample lids that have been dropped onto the ground prior to sample collection.
- Prevent the cooler lid from remaining open for an extended period of time once samples are placed inside.
- Avoid sampling near a running vehicle where exhaust fumes may affect the sample.
- Avoid touching the exposed end of a sampling tube, if applicable.
- Prevent rainwater from rain gear or other surfaces from dripping into sample bottles.
- Avoid eating, smoking, or drinking during sample collection.
- Avoid sneezing or coughing in the direction of an open sample bottle.
- Minimize the exposure of the samples to direct sunlight, as sunlight may cause biochemical transformation of the sample to take place.
- Decontaminate sampling equipment prior to sample collection using a TSP-soapy water wash, distilled water rinse, and final rinse with distilled water.
- Dispose of decontamination water/soaps appropriately; i.e., avoid discharge to the receiving water.

Sample Handling Procedures

Immediately following collection, sample bottles for laboratory analytical testing will be capped, labeled, documented on a COC form provided by the analytical laboratory; sealed in a re-sealable storage bag; placed in an ice-chilled cooler, as close to 4°C as practicable; and delivered within 24 hours to the California-certified laboratory. Prospective laboratories are shown below:

Sierra Analytical Laboratories
26052 Merit Circle Suite 105
Laguna Hills, CA 92653
949-348-9389

BC Laboratories
4100 Atlas Ct.
Bakersfield, CA 93308
661-327-4911

Immediately following collection, samples for field analysis will be tested in accordance with the field instrument manufacturer's instructions and results will be recorded on the Sampling Activity Log (Attachment 2).

Sample Documentation Procedures

Original data documented on sample bottle identification labels, COC forms, Sampling Activity Logs, and Inspection Checklists will be recorded using waterproof ink. These will be considered accountable documents.

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If an error is made on an accountable document, the individual will make corrections by lining through the error and entering the correct information. The erroneous information will not be obliterated. Corrections will be initialed and dated.

Sampling and field analysis activities will be documented using the following:

- **Sample Bottle Identification Labels:** Sampling personnel will attach an identification label to each sample bottle. At a minimum, the following information will be recorded on the label:
  - Project name
  - Project number
  - Unique sample identification number and location:
    a) [Project Number]-[Six digit sample collection date]- [Location](*Example:* 25542-081801-Inlet 472)
    b) QA/QC samples will be identified similarly using a unique sample number or designation (*Example:* 25670-081801-DUP1)
  - Collection date/time (no time applied to QA/QC samples)
  - Analysis constituent
- **Sampling Activity Logs:** A log of sampling events will identify:
  - Sampling date
  - Separate times for collected samples and QA/QC samples recorded to the nearest minute
  - Unique sample identification number and location
  - Analysis constituent
  - Names of sampling personnel
  - Weather conditions (including precipitation amount)
  - Field analysis results
  - Other pertinent data
- **Chain of Custody Forms:** Samples to be analyzed by a laboratory will be accompanied by a COC form provided by the laboratory. Only the sample collectors will sign the COC form over to the lab. COC procedures will be strictly adhered to for QA/QC purposes.
- **Stormwater Quality Construction Inspection Checklists:** When applicable, the stormwater inspector will document on the checklist that samples for non-visible pollutants were taken during a rain event.

Sample Analysis

Samples will be analyzed for the applicable constituents using the analytical methods identified in Table L-3. For samples collected for field analysis, collection, analysis, and equipment calibration will be in accordance with the field instrument manufacturer's specifications.

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Quality Assurance/Quality Control

For an initial verification of laboratory or field analysis, duplicate samples will be collected at a rate of 10 percent or 1 duplicate per sampling event. The duplicate sample will be collected, handled, and analyzed using the same protocols as primary samples. A duplicate sample will be collected at each location immediately after the primary sample has been collected. Duplicates will be collected where contamination is likely, not on the background sample. Duplicate samples will not influence evaluations or conclusions; however, they will be used as a check on laboratory quality assurance.

Data Management and Reporting

A copy of water quality analytical results and QA/QC data will be submitted to the Project Manager and Bright Source Energy, Inc. within 5 days of sampling (for field analyses) and within 30 days (for laboratory analyses).

Lab reports and COCs will be reviewed for consistency between lab methods, sample identifications, dates, and times for both primary samples and QA/QC samples. Data, including COC forms and Sampling Activity Logs, shall be kept with the SWPPP.

Data Evaluation

An evaluation of the water quality sample analytical results, including figures with sample locations, the water quality analytical results, and the QA/QC data, will be included in the onsite SWPPP.

Should the runoff/downgradient sample show an increased level of the tested analyte relative to the background sample, the BMPs, site conditions, and surrounding influences will be assessed to determine the probable cause for the increased analyte level. As determined by the site and data evaluation, appropriate BMPs will be repaired or modified to mitigate discharges of non-visual pollutant concentrations. Any revisions to the BMPs will be recorded as an amendment to the SWPPP.

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Attachment 1 – Visual Inspection Field Log

Risk Level 1, 2, 3 ***Visual Inspection Field Log Sheet***						
Date and Time of Inspection:				Report Date:		
Inspection Type:	□ Weekly	□ Before predicted rain	□ During rain event	□ Following qualifying rain event	□ Contained stormwater release	□ Quarterly non-stormwater
Site Information						
Construction Site Name:						
Construction stage and completed activities:					Approximate area of exposed site:	
Weather and Observations						
Date Rain Predicted to Occur:				Predicted % chance of rain:		
Estimate storm beginning: _____ (date and time)		Estimate storm duration:_____ (hours)		Estimate time since last storm: _____ (days or hours)	Rain gauge reading: _____ (inches)	
Observations: If yes identify location						
Odors	Yes □	No □				
Floating material	Yes □	No □				
Suspended Material	Yes □	No □				
Sheen	Yes □	No □				
Discolorations	Yes □	No □				
Turbidity	Yes □	No □				
Site Inspections						
Outfalls or BMPs Evaluated			**Deficiencies Noted**			
(add additional sheets or attached detailed BMP Inspection Checklists)						
Photos Taken:	Yes □	No □	Photo Reference IDs:			
Corrective Actions Identified (note if SWPPP/REAP change is needed)						
Inspector Information						
Inspector Name:				Inspector Title:		
Signature:					Date:	

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Attachment 2 – Sampling Activity Log

RAIN EVENT GENERAL INFORMATION				
Project Name	Rio Mesa Solar Electric Generating Facility Project			
Project Number	NA			
Contractor	Bechtel Power Corporation			
Sampler's Name				
Signature				
Date of Sampling				
Season (Check Applicable)	❒ Rainy		❒ Non-Rainy	
Storm Data	Storm Start Date & Time:		Storm Duration (hrs):	
	Time elapsed since last storm (Circle Applicable Units)	Min. Hr. Days	Approximate Rainfall Amount (inches)	

For rainfall information: http://cdec.water.ca.gov/weather.html or http://www.wrh.noaa.gov/wrhq/nwspage.html

SAMPLE LOG		
Sample Identification	**Sample Location**	**Sample Collection Date and Time**

Specific sample locations descriptions may include: 100 ft upstream from discharge at eastern boundary, runoff from northern waste storage area, down gradient of inlet located near the intersection of A Street and B avenue, etc.

FIELD ANALYSIS		
❑Yes	❑ No	
Sample Identification	**Test**	**Result**

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ATTACHMENT DR 80-2

PRELIMINARY DRAINAGE, EROSION, AND SEDIMENT CONTROL PLAN

Rio Mesa Solar Electric Generating Facility
Riverside County, California

Preliminary Drainage, Erosion, and Sediment Control Plan

Document No. 25670-000-30R-K01G-00001

Submitted by:
BrightSource Energy Inc.

With Technical Assistance by:

Bechtel Power Corporation
Frederick, Maryland

February 2012
Revision A

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1. Introduction

This Preliminary Drainage, Erosion, and Sediment Control Plan (DESCP) has been prepared for the proposed Rio Mesa Solar Electric Generating Facility (Rio Mesa SEGF) to be located on the Palo Verde Mesa in Riverside County, California as shown in Figure 1. The Project is partially on private land and partially on federal property managed by the U. S. Bureau of Land Management (BLM). The Rio Mesa SEGF consists of three individual power generating units; Rio Mesa 1, Rio Mesa 2 and Rio Mesa 3, and a Common Area with shared facilities. Facilities within the Common Area serve all three power units and include primarily the Administration Building, the Switchyard, 3 groundwater production wells, a groundwater monitoring well, two evaporation ponds, and a temporary Heliostat (assembly) Building. Each power generating unit will include a solar field occupied by heliostat arrays and a power block where the power tower, steam generation and electric conversion systems will be located.

The Project will deliver power at 220 kilovolts (kV) to Southern California Edison's (SCE) Colorado River Substation (CRS). From each power block area, power will be transmitted underground at 220 kV to the Project switchyard (located in the common area). Project power is then transmitted via a common 9.7 mile generator tie-line (gen-tie line) to the CRS.

The Rio Mesa SEGF site is about 5,795 acres in area and most of which will be occupied by the heliostat arrays. The three units will have a combined net rating of approximately 750 megawatts. The Rio Mesa SEGF will be constructed in three phases, staggered with a 3-month overlap each: Rio Mesa 1 (net nominal 250 megawatts), Rio Mesa 2 (net nominal 250 megawatts), and Rio Mesa 3 (net nominal 250 megawatts). The drainage, erosion and sediment control measures described in this plan are proposed best management practices to support the Application For Certification (AFC) for the construction activities of Rio Mesa 1, 2, 3 and the Common Area, and for site mobilization activities, specifically, erection of tortoise and security fences, for the Rio Mesa SEGF site.

This DESCP describes the stormwater best management practices (BMPs) to be utilized on the Rio Mesa SEGF to minimize potential increase in off-site flooding and erosion, and adverse impact on water quality as a result of project development. Construction BMPs will be implemented to reduce impacts of potential increase in sedimentation on adjacent and downstream properties during all phases of the construction period, so that all local, state, and federal regulatory requirements associated with the protection of water quality and soil resources can be met from the start of the project life.

The DESCP also discusses the requirements of the California State Water Resources Control Board (State Water Board), Colorado River Basin Regional Water Quality Control Board (RWQCB) and the Riverside County as they relate to construction and post-construction BMPs, including those requirements associated with the site.

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1.1. Drainage, Erosion, and Sediment Control Plan Elements

This DESCP includes the following elements:

- Vicinity Map – Figure 1 shows the location of the Rio Mesa SEGF project site and the overall configuration of Rio Mesa 1, 2, 3 and the Common Area. Also shown in Figure 1 are the major geographic features in the project vicinity including watercourses, existing utilities and sensitive areas.

- Site Delineation – Figures 2 through 8 show the locations of existing structures, and layout of the project site including project boundaries, security and tortoise fences, proposed structures, plant access roads, utilities and corridors, and construction facilities.

- Drainage:
  - Topography: Topography of the site vicinity is depicted in Figure 9. It forms the basis for the delineation of existing upstream tributary areas, downstream drainage areas, and major watercourses (washes) for the evaluation of stormwater runoff and flood hazard for the existing (pre-development) condition.
  - Proposed Grade: Proposed rough grade elevations for the permanent and construction facilities for Rio Mesa 1, 2, 3 and the Common Area including road crossing over major ephemeral washes, proposed flood protection berm and channel, drainage swales and tie-ins to the existing topography are shown in Figures 10 through 14.
  - Hydrology: Existing (pre-development) and proposed (post-development) hydrologic calculations for onsite areas and offsite areas are to be developed in conformance with state and local regulations.
  - Hydraulics: The selection and sizing of the onsite drainage system and diversion facilities is to be developed in conformance with state and local regulations.

- Watercourses and Critical Areas – Figures 1, 2, 9 show the locations of onsite and nearby watercourses including drainage ditches relative to Rio Mesa SEGF. Wash crossings will be identified later. To the east of the site is the Palo Verde irrigation canal system.

- Clearing and Grading – Site areas to be cleared and graded for permanent project facilities include the power block area, the Switchyard area, the Administration Building and storage, the flood protection berms and diversion channels, the main plant access road, paved and unpaved plant roads, and production wells area. Figures 25 to 29 show the road grading and paving for the main access road to the site. Figures 30 to 33 show the paving plan for Rio Mesa 1, 2, 3 and the Common Area. Site areas to be cleared and graded for temporary construction facilities and elements include the Heliostat Building and the construction laydown and stockpile. Figures 22 to 23 include grading and surfacing details for the project

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elements. A technical specification for earthwork, grading and backfilling will be provided later.

- Soil, Wind and Water Erosion Control – The general layout and details of the drainage, wind and water erosion and sediment controls for Rio Mesa 1, 2, 3 and the Common Area are shown in Figures 15 to 18, with the details provided in Figures 19 and 20. Typical fencing sections and details are shown in Figures 21 and 24. A description of the BMPs proposed for the site is given in Section 5.

1.2. Regulatory Background

The Project will comply with all local, state, and federal regulatory requirements associated with the protection of water quality and soil resources. The following subsections discuss the major requirements of the laws, ordinances, regulations and standards related to the DESCP.

1.2.1. Federal Clean Water Act

The federal Water Pollution Control Act, commonly referred to as the Clean Water Act (CWA), established the basic structure for regulating the pollution discharges into the nation's waters and regulating the quality standards for the surface waters. Under the CWA, the U.S. Environmental Protection Agency implemented National Pollutant Discharge Elimination System (NPDES) program to protect water quality of receiving waters. Under Section 402, discharge of pollutants to receiving waters is prohibited unless the discharge is in compliance with an NPDES permit. The CWA allowed EPA to authorize the NPDES Permit Program to state governments, enabling states to perform many of the permitting, administrative, and enforcement aspects of the NPDES Program.

1.2.2. Federal Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) gives the EPA the authority to control hazardous waste, including the generation, transportation, treatment, storage, and disposal of hazardous waste. In order to prevent surface and groundwater contamination, RCRA sets guidelines for determining hazardous wastes, and identifies proper methods for handling and disposing of those wastes. EPA authorizes the California Department of Toxic Substances Control (DTSC) to implement RCRA in the state.

1.2.3. Porter-Cologne Water Quality Control Act

The State of California established its regulations under the Porter-Cologne Water Quality Control Act (the Act) to comply with the CWA. The Act established the State Water Resources Control Board (State Water Board) and its nine Regional Water Quality

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Control Boards (Regional Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality in California. The State Water Board sets the statewide policy for the implementation of federal and state laws and regulations. The Regional Boards adopt and implement the policy through the Water Quality Control Plans (Basin Plans). Under Section 13200, the project site is located within the boundaries of the Colorado River Basin Regional Water Quality Control Board.

1.2.4. California Water Code Section 13751

California Water Code Section 13751 requires that anyone who constructs, alters, or destroys a water well, cathodic protection well, groundwater monitoring well, or geothermal heat exchange well, file a well completion report with the DWR. Reports must be filled within 60 days of well completion.

1.2.5. California Code of Regulations, Title 22 Sections 64400.80 through 64445

This section of the California Water Code requires monitoring for potable water wells, defined as non-transient, non-community water systems (serving 25 people or more for more than 6 months). Regulated wells must be sampled for bacteriological quality once a month and the results submitted to the State Department of Health Services (DHS). If no exceedances were found in the prior 12 months, the well operator may request a reduction in monitoring frequency to quarterly. The well must also be monitored for inorganic chemicals annually and organic chemicals quarterly. The operator may apply for a monitoring waiver for organic chemicals if it can be documented that the chemical has not been previously used, manufactured, transported, stored, or disposed of within the watershed or zone of influence and, therefore, that the source can be designated nonvulnerable. If previous use of the chemical locally is unknown or the chemical is known to have been used previously and the source cannot be designated nonvulnerable, the operator may still be eligible for a waiver based on a review related to susceptibility to contamination.

1.2.6. California Code of Regulations, Title 27

Title 27 applies to all disposal sites including active, inactive, closed, or abandoned sites. These regulatory standards were promulgated by the California Integrated Waste Management Board (CIWMB) and implemented by the SWRCB. The purpose of the regulations is to promote the health, safety and welfare of the people of the State of California, and to protect the environment by establishing minimum standards for the handling and disposal of solid wastes at disposal sites. The regulations establish waste and site classifications and waste management requirements for the treatment, storage, or disposal of solid waste in landfills, surface impoundments, waste piles, and land

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treatment units. The Project will use evaporation ponds for wastewater that cannot longer be recycled.

SWRCB Resolution No. 75-58; California Water Code Sections 461, 13550, and 13551
SWRCB Resolution No. 75-58 provides statewide water quality principles for adoption of discharge requirements and implementation actions for power plants that depend upon inland waters for cooling. This policy also provides guidance in the planning of new power plants to encourage the use of wastewater for cooling if available, thus minimizing the use of potable water. In addition, California Water Code Sections 461, 13550, and 13551 encourage the conservation of potable water resources and the maximum reuse of wastewater to conserve potable water, particularly in areas where recycled water of adequate quality is available at a reasonable cost.

1.2.7. Riverside County Regulations

The site is located within Riverside County California. The basis for the hydrologic analysis was the Riverside County Flood Control and Water Conservation District Hydrology Manual (Riverside County Manual). Riverside County Flood Control staff was consulted in the appropriateness of use of this manual since the site is located outside of the seven jurisdictional zones of the Riverside County Flood Control District. The Rio Mesa SEGF site is not within one of the seven local flood control districts. According to Riverside County Flood Control staff, for areas that do not fall within any local flood control districts, the Riverside County Flood Control District is the default regulating agency. The California Energy Commission (CEC) has jurisdication for this project since it exceeds the 50 MWe threshold for solar thermal power plants. The CEC requires that project design meets the requirements of all federal, state and local floodplain regulations.

The Riverside County Flood Control and Water Conservation District has developed a Stormwater Quality Best Management Practice Design Handbook. The purpose of this handbook is to provide design procedures for structural Best Management Practices (BMPs) for new development and redevelopment within Riverside County. The methods used in this handbook for determining design volumes and flow, are based on studies from the ASCE Manual of Practice No. 87 (1998) and the California BMP Handbook respectively. These methods meet the criteria established by the Santa Ana, San Diego, and Colorado River Basin Regional Water Quality Control Boards (RWQCB) that have jurisdiction within Riverside County.

Construction requirements relevant to building, grading and erosion and sediment control are found in Riverside County Ordinance 457, which applies to all unincorporated areas of Riverside County, unless specifically exempted. Section J.10 of Ordinance 457 requires stockpiles to be placed temporarily on a site for a period not to exceed 12 months. Stockpiles may not obstruct or divert natural drainage or watercourses. Erosion and dust control measures must be implemented, and the stockpile cannot cause any adverse effect on adjacent properties. Section J.14 of Ordinance 457 requires construction

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sites to minimize the runoff of sediment off site and into waters of the U.S. If practical, phased grading is to be conducted. This section requires that a Notice of Intent (NOI) be filed to seek coverage under the state's NPDES Construction General Permit for discharges of storm water on construction sites more than 1 acre in size. In keeping with past practice, the CEC may allow this project to avoid formal NOI submittals. The ordinance also requires development and implementation of a site-specific SWPPP and monitoring program pursuant to requirements of that permit.

Construction requirements relevant to storm water and urban runoff management and discharge controls are found in Riverside County Ordinance 754.2. The intent of this ordinance is to "protect and enhance the water quality of County watercourses, water bodies, ground water, and wetlands in a manner pursuant to and consistent with applicable requirements contained in the Federal Clean Water Act, Porter-Cologne Water Quality Act, and any applicable state or federal regulations, related administrative orders or permits." Section 1.C of Ordinance 754.2 requires the control of storm water runoff on all new development or redevelopment sites to prevent deterioration of water quality. To prevent such deterioration, the Director of the County Transportation and Land Management Agency may establish BMPs and may identify the manner of implementation. Section 1.E of Ordinance 754.2 requires commercial and industrial facilities to comply with this and other ordinances (including 457), and establishes that these types of facilities may be subject to a regular program of inspection.

The Riverside County Flood Hazard Zone Ordinance Code 458 requires a permit for development activity within a designated flood zone. The ordinance requires that the flood carrying capacity of the altered or relocated portion of any watercourse or floodplain shall be maintained.

Furthermore, the California Stormwater Quality Association's Stormwater Best Management Practices Handbook for Construction (CASQA, 2010) and the Stormwater Best Management Practices Handbook for Industrial and Commercial (CASQA, 2003) are used in the development of BMPs for the project site.

1.3. Project Overview

1.3.1 Project Description

Rio Mesa SEGF will consist of three solar thermal-electric power plant units that will be located approximately 12 miles southwest of the city of Blythe on the Palo Verde Mesa in Riverside County, California. The community of Palo Verde is located approximately two (2) miles southeast of the Project site. The Project is partially on private land and partially on federal property managed by the U. S. Bureau of Land Management. The three Rio Mesa SEGF power plants will have a combined net rating of approximately 750 megawatts. The Rio Mesa SEGF will be constructed in three phases, staggered with a 3-month overlap each: Rio Mesa 1 (nominal 250 megawatts), Rio Mesa 2 (nominal 250 megawatts), and Rio Mesa 3 (nominal 250 megawatts).

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Figure 1 shows the location of the project. Locations of watercourses and washes are to be identified at a later stage. A site plan is provided in Figure 2. All figures are included in Appendix 1.

The site is primarily on a mesa that ends at a distinct scarp on the east side of the site. Developed agricultural land is located in the Palo Verde Valley east of the site. The Bradshaw Trail extends along the north portion of the site and the Riverside County and Imperial County border extends along the south boundary of the site. An unpaved access road extends along the Western Area Power Administration (WAPA) 115kV overhead power transmission line in a northeast to southwest direction through the eastern portion of the site. A buried high pressure gas line also extends through the site along the WAPA transmission line corridor.

The site is essentially undeveloped and covered with sparse native desert vegetation. This vegetation consists primarily of shrubs and grasses. Existing improvements in the site area include the unpaved Bradshaw Trail, which extends through the north portion of the site, and a utility corridor with overhead power transmission lines, a gas line, and associated unpaved access road.

Groundwater was not encountered in the exploratory borings and test pits excavated as a part of a preliminary geotechnical investigation (Ninyo & Moore, 2011). Review of logs of exploratory borings drilled in 1977 (Ninyo & Moore, 2011) indicates that groundwater was reported at depths ranging from approximately 100 to 200 feet below the ground surface at the site. Therefore, the presence of groundwater is not anticipated to be a factor during construction. Construction dewatering is not considered necessary.

1.3.2 Land Occupancy

The Rio Mesa SEGF project (for all three units and the Common Areas) will occupy approximately 5,795 acres (Figures 3 through 6). Each plant requires approximately 1,850 acres (or 2.9 square miles) and includes a power block area surrounded by an array of approximately 85,000 heliostats. The nominal capacity of each solar plant is 250 megawatts (MW), for a total Project nominal output of 750 MW. The Common Area, situated on the east boundary of the project, between Rio Mesa 2 and 3 will occupy approximately 115 acres and will include shared facilities (administration/storage building, switchyard, groundwater production wells). Portions of this construction logistics area will be used during construction for staging and temporary offices.

1.3.3 Heliostat Arrays

Each power plant will be surrounded by heliostat arrays. Each 250-megawatt plant (Rio Mesa 1, 2 and 3) will have heliostat arrays consisting of approximately 85,000 heliostats. The heliostat arrays will be arranged around a single centralized solar power

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tower. The heliostats will automatically track the sun throughout the day and reflect the solar energy to the boiler on top of the tower. Each heliostat consists of two mirrors and each heliostat mirror is 8.6 ft (2.6 m) wide by 12.0 ft (3.66 m) high, yielding a reflecting surface of 103.2 ft^2 (9.52 m^2). The two mirrors are mounted on a single pylon, along with a computer-programmed aiming control system that directs the motion of the heliostat to track the movement of the sun. The pylons will be fabricated from 6-inch pipe, and they will be embedded in the ground so as to resist lateral forces due to wind or flood flows.

1.3.4 Power Blocks

Each power plant unit will have a solar power tower, steam-turbine generator, an air-cooled condenser and auxiliary systems, which collectively are referred to as the power block. The tower supports the receiving boiler and moves steam to the turbines near its base. The combined height of towers and boiler will be about 750 ft. For each power plant, the power-block lateral dimensions will be about 800 ft wide by about 1,200 ft long, which represents an area of about 22 acres. The power block for each unit will be graded with moderate slopes to direct runoff to swale/ditches and pass stormwater through the oil/water separators before releasing flow to outlet aprons, where placement of stone rip-rap will prevent local erosion and reinstate natural sheet flow conditions toward downstream. Each power block will be protected by a flood protection berm and associated diversion channel, which will be designed for a 100-year storm event. The preliminary design of the protection berm and diversion channel is shown in Figures 11 through 13.

A wastewater treatment system (WWTS) is provided in each plant. For each plant, miscellaneous wastewater created during operation will be collected and processed through the WWTS. The WWTS clean effluent will be recycled to the treated water storage tank for reuse within the plant. The concentrated effluent from the WWTS is transported by truck to the evaporation ponds located in the common area.

1.3.5 Substation

The Project will deliver power at 220 kilovolts (kV) to Southern California Edison's (SCE) Colorado River Substation (CRS). From each power block area, power will be transmitted underground at 220 kV to the Project switchyard (located in the common area). Project power is then transmitted via a common 9.7 mile generator tie-line (gen-tie line) to the CRS.

1.3.6 Common Area

As shown in Figure 14, an administration, warehouse, and maintenance complex, also part of the common area, will be located next to the 24-ft plant entrance road. The

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complex will require about 3.1 acres, but the building footprint and parking area will occupy about 1.4 acres. Two evaporation ponds, with an area of about 2 acres each, are located east of the administration building.

Next to the administrative area is a graded well area housing a storage tank and three pumped wells. Water pumped from the wells will be treated at the raw water treatment system (RWTS) located in the common area. The treated water will be used for mirror washing, auxiliary cooling makeup, process makeup and potable water. A WWTS is provided in the common area. The reject waste from the RWTS and other miscellaneous sump waste generated during operation in the water treatment building will be collected and processed through the common area WWTS. The WWTS clean effluent will be reused as mirror wash water. The WWTS concentrated effluent will be discharged into the facility's evaporation ponds.

1.3.7 Access Roads and Service Paths

The Rio Mesa SEGF access will be with a 24-ft paved road that connects to the existing 34th Ave (Figure 2). This 34th Ave is an existing dirt road, which intersects with Interstate 78. Additionally, 20-ft paved access roads will be created to access the power blocks of the three Rio Mesa plant sites within the fenced solar sites. The paved roads will follow the existing terrain to the extent practicable but will potential become a barrier to the natural overland flow from the upslope areas especially during regular, less severe, storm events. The total length of the 20-ft paved road is about 14,500 ft. Where necessary, drainage culverts will be installed to pass storm water flow at the ephemeral wash crossings to the downstream side of the roads. During severe rainfall events, it is expected that the flood flow will overtop the road surfaces. Finally, 12-ft dirt roads would be installed diagonally through the heliostat fields and used for access to the heliostat maintenance paths. Moreover, 12-ft dirt roads would be installed as perimeter roads at the fence line of each Rio Mesa unit. The total length of 24-foot paved roads is about 12,700 ft, the total length of the 12-foot diagonal access dirt roads is about 34,000 ft, and the total length of the 12-foot perimeter dirt roads is about 148,000 ft. Within the heliostat fields, ungraded maintenance paths will be located concentrically around the power block to provide access to the heliostat mirrors for maintenance and cleaning. The typical distance between the heliostat maintenance paths center-lines is 152.6 ft (46.5 m). The paths will follow the existing topography and will occupy about 6 percent of the solar field. The total pathway length for the heliostat maintenance paths is about 1,423,500 ft for all three Units. Both the dirt roads and the heliostat maintenance paths will follow closely the existing topography to minimize land disturbance and to maintain the pre-development hydrologic condition to the maximum extent possible.

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1.4 Watercourses and Other Critical Areas

1.4.1 Watercourses

The project area is located in the Palo Verde Mesa hydrologic unit of the Colorado River Hydrologic Region, which includes approximately 226,000 acres in the Imperial and Riverside Counties of California. The basin is bounded by nonwater-bearing rocks of the Big Maria and Little Maria Mountains on the north, of the McCoy and Mule Mountains on the west, of the Palo Verde Mesa on the east, and of the Palo Verde Mountains on the south. The northwest boundary and parts of the western boundary are drainage divides. The valley is drained by McCoy Wash to the Colorado River.

The majority of the watershed is located west and southwest of the site location and slopes in an eastern direction into the Palo Verde Mesa region. A series of mountain ranges are located west, northwest, and southwest of the site and serve as the tributary watershed divides (within Riverside and Imperial Counties). Specifically, the Palo Verde Mountain Range is located southwest of the site and the Mule Mountain Range is located to west and northwest. The project site is located within the southern part of the Palo Verde Mesa.

Waterways in or near the project site include unnamed ephemeral washes. These ephemeral washes typically flow only in response to storm events. There are no springs located on the project site.

1.4.2 Other Critical Areas

As described in the TM "Rio Mesa Solar – Overall Existing Condition Hydrologic & Hydraulic Analysis" of Appendix 2, the project area is dissected by many ephemeral washes. The active flow channels are devoid of vegetation and typically have a sandy gravel substrate, although some washes also contain cobble and scattered larger rocks.

Also the same TM discusses the existence of 100-year floodplains within the Rio Mesa SEGF site. The site is encompassed within several Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) panel numbers. According to the FIRM Index (06065CIND2A, sheets 1 and 2) all of the encompassing panels are currently not printed, and so these areas are considered to be Zone D, which is denoted as undetermined risk areas. The encompassing panels (which are not printed) include: 06065C3775G, 06065C3200G, 06065C3225G, and 06065C3780G. Panel 06025C0275C (effective date of September 26, 2008) is published as the southern half of panel 06065C3775G, however it does not show any flood hazard information outside of Imperial County. Although the FIRM's do not currently depict any special flood hazard areas impacting the site, the California Department of Water Resources (DWR) has recently published a study which delineates "awareness floodplains" or "100-year floodplains" based upon best available data. The DWR study denotes 6 separate 100-year

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flood plains traversing the site (refer to Figure 7323HYD404 of the TM). According to the Riverside County Flood Control, the "awareness floodplains" are treated as 100-year floodplains for the purpose of development. This means that 100-year water surfaces would need to be defined and that structures would need to be raised above the 100-year water surface or the structures would need to be flood proofed to protect against the 100-year water surface. The Riverside County Flood Control agency indicated that no FEMA submittal is required for developing within an "awareness floodplain".

2. Hydrology

2.1 Precipitation

The project site is located in southern California in Riverside County, close to Palo Verde. The project site is part of the Imperial Reservoir Watershed and it is located within the Colorado River Hydrologic Region. The mean annual precipitation (1948 to 2010) recorded at the Blythe Airport weather station is 3.54 inches per year. Most of the precipitation in the project area falls during January through March and July through September. Based on the NOAA Atlas 14, the 24-hour precipitation in the site vicinity (based on the Blythe Station with Site ID: 04-0924) for the 100-year, 25-year and 10-year storm events is 3.86 inches, 2.83 inches, and 2.19 inches, respectively (Riverside County, 2006).

2.2 Drainage

Stormwater runoff at the site is predominantly sheet flow from west to east. With exception of the immediate areas near the power blocks, substation, and the common administrative area, the general pre-development drainage and flood flow patterns will be maintained. The flood protection berms and channels at the power block and Common Area will intercept and divert stormwater flow from the upstream areas for storm events up to a 100-year return period to downstream of the protected areas. Riprap aprons are provided at the downstream ends of the protection berms/channels to reduce the flood flow velocity and to restore the natural drainage patterns downstream. Away from the power block and the Common Area, some ephemeral washes will be disturbed as a result of providing the necessary crossings for the roads to allow for plant access. At grade crossings will be used wherever possible, otherwise drainage culverts will be provided at the wash crossings to facilitate the passage of stormwater flow. As a result of the design concept to maintain the roads and paths at grade to minimize disturbance to the natural drainage to the extent practicable, all paved roads, dirt roads and maintenance paths on site will be subject to overtopping during high flood flow events. Areas disturbed by the tracked vehicles for the installation of the heliostats and will not be graded for the permanent facilities will be restored to their natural grades immediately after construction.

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As shown in Figures 11 to 14, stormwater will be diverted away from the power block, and the common administrative area by berms/channels on the upslope sides of the areas to be protected. The protection berms will be designed for a 100-year storm event. The power block and the areas where the Administration Building and production wells are located will be graded with moderate slopes to direct runoff away and will implement BMPs as needed to reduce erosion and to promote a natural sheet flow condition in the downstream area. Runoff collected from areas with potential oil and grease contamination will pass through oil/water separator units sized in accordance with Riverside WQMP requirements before discharge. At the location where the main plant access road crosses the diversion channel and berm into the power block, culverts may be constructed to pass the flood flow from a 100-year storm event. The preliminary flood flow estimation using the HEC-1 model and alluvial fan methodology is included in Appendix 2.

The stormwater best management practices described in this DESCP follow the California Storm Water Quality Association (CASQA) California Storm Water BMP Handbooks, the Caltran Construction Stormwater BMPs and Caltran 2010 Standard Plans and Specifications, and comply with new NPDES General Permit for Storm Water Discharges from Construction Activities No. CA000002.

Temporary construction laydown, temporary heliostat assembly building area, and parking areas are shown in Figures 7 and 8. Erosion and sediment control plans for the three Rio Mesa units and the Common Area are shown in Figures 15 to 18. A temporary drainage system and/or flood protection measures will be installed as needed to control of storm water during construction.

2.3 Hydraulic and Hydrology Calculations and Memorandum

Appendix 2 includes the following documents:

Technical Memoranda (TM):

- Technical Memorandum by VTN, dated August 31, 2011, Subject "Rio Mesa Solar – Final Post Construction Hydrologic & Hydraulic Analysis"

  This TM evaluates the hydrologic condition of the post-construction project condition and determines the difference in runoff volume and peak flow between the existing condition and the post-construction condition. In summary the existing condition hydrologic analysis has been modified in the following manner to model the post-construction condition: the curve numbers have been adjusted to account (i) for the proposed graded and paved roads within the site and around the perimeter (ii) for the proposed buildings/structures and power block areas within the site and (iii) for the proposed mirrors within the site. Based upon the runoff volume calculated in the post-construction condition (100-yr storm event), the difference in post-construction runoff volume and existing condition runoff volume is less than 2 percent (increase). All other storm events have smaller

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percent increases. Based on the minor increase in runoff, the development of this site should not have a negative impact on any downstream properties.

- Technical Memorandum by VTN, dated July 6, 2011, Subject "Rio Mesa Solar – Overall Existing Condition Hydrologic & Hydraulic Analysis"

  The objective of this TM is to provide a description of the existing condition flow patterns and storm water runoff for the proposed solar field site.

- Technical Memorandum by VTN, dated October 4, 2011, Subject "Rio Mesa Solar – Final Erosion, Scour, and Sediment Transport Analysis"

  This TM describes the methodology and calculations utilized to evaluate sediment transport and to estimate the potential scour at the heliostats. A comparison is made between the existing and developed conditions for the sediment load. For the 100-year storm and the existing condition, the sediment load is 54.72 ac-ft. For the developed condition, the sediment load increases to 55.89 ac-ft. These results represent an increase of about 2% for the sediment load.

3 Clearing and Grading

3.1 Areas to be Cleared and Graded

The existing site has about a two (2) percent or less and relatively uniform natural slope up from east to west, located on a relatively small drainage basin with the hydrologic characteristics of alluvial fans. Majority of the areas within the project property boundaries will be occupied by the heliostats. The erection and operation of the majority of the heliostat arrays requires only limited topsoil stripping and local leveling of significant changes in the terrain. Heliostats are relatively small (13 ft high each) and light (100 kilograms each) structures, contain no hazardous materials, and are not essential structures. More substantial grading will be limited to the power block areas, substation and common administration building, and the major access roads. During construction period, an area housing the heliostat assembly building that is within the common area will also be graded.

Within the heliostat arrays, vegetation along the maintenance paths will be cleared with a blade to reduce the risk of fire. Scalping vegetation with a grader blade will likely go a couple inches into the soil and leave some of the existing root systems intact to anchor the soil at locations where the vegetation was cleared, reducing the potential for erosion. In areas of substantial grading (power block areas, substation, the common administrative building area, heliostat assembly building area, major access roads and in heliostat field areas requiring significant improvements to grade for access roads), about one foot of topsoil will be stripped, in order to remove plants and roots to accommodate heliostat

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erection in the solar field, and as pre-excavation activity in the power block and solar tower areas. To the extent possible, stripped topsoil will be reused to form the final site grades. Succulent plant species and selected sensitive and rare plant species would be salvaged, if necessary. Shrubs and other plant species would be revegetated by the collection of seeds, and re-seeding following decommissioning. Natural grades and existing drainage patterns in the solar field will be maintained where practical.

All underground piping and wiring will be installed, followed by installation of the foundation for the new power blocks, solar towers and associated structures.

For the construction of each power block, the parking areas for construction workers will be located off one of the access roads before the entrance to the power block. For the construction of facilities within the common area, parking areas for construction workers will be located off the access road to the common administrative area, as well as off the access road to the heliostat assembly building area. These temporary parking areas will be closed after the construction phase. No pavement will be applied and minimum clearance of the location will be used. The laydown areas for construction materials will be located within the common area.

Primary access to the site is via the 34th Ave interchange on Interstate 78. In addition, the access roads to individual plants will be paved from their point of connection to the main 24 feet plant access road. Access road beds will typically be 30 feet of asphalt with 5-foot-wide crushed rock shoulders. Stabilized entrances/exits and wheel wash facility will be provided prior to vehicle exiting the construction areas to minimize mud and sediment from being carried on to the public road.

3.2 Location of Disposal Areas, Fills or Other Special Areas

All excavated soil will be used onsite for grading and leveling purposes and no soil will be disposed of offsite.

3.3 Existing and Proposed Topography

As shown in Figure 9, the existing site has about a 2 percent or less and relatively uniform natural slope up from east to west, which can be accommodated by the heliostat fields. The sites topography varies across each heliostat field requiring different levels of disturbance to obtain the final topography suitable for the erection and operation of the heliostats. Grade and topography are to be modified (if required) to ensure the minimum disturbance needed for the access of installation equipment and materials. In areas where the existing terrain will permit access, grading will be restricted and only vegetation is to be removed. In areas where the existing topography requires modification, access will be improved by leveling (cut and filling) or conventional grading (where required).

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At completion of the project, onsite drainage will be accomplished through gravity flow. Stormwater will flow through the heliostat fields and diverted around the power blocks and switchyard on their north and south sides to channel storm runoff around each area before overflowing through rip-raps to reinstate the natural drainage conditions.

3.4 Volumes of Cut and Fill

The grading of the site to design elevations will require cut and fill. Preliminary cut and fill volumes for each project element are to be provided later. Trenches excavated for the underground utilities will be entirely refilled. The power block in each unit will require fill to elevate the foundation and to erect the berm. The fill material will use the cut material from the site as much as possible including the surplus cut volume from the heliostat field or roads.

4 Project Schedule

Construction of Rio Mesa SEGF from site preparation and grading to commercial operation is expected to take place from the third quarter of 2013 to the first quarter of 2016, a total of 33 months. Commercial operations are expected to commence in the third quarter of 2015 at Rio Mesa 1, in the fourth quarter of 2015 at Rio Mesa 2, and in the first quarter of 2016 at Rio Mesa 3. Major milestones are listed in Table 1. A more detailed project schedule will be provided in a future update of this DESCP once more detailed information on the project design and construction are known and a Contractor has been selected.

TABLE 1 Project Schedule Major Milestones

Activity	**Date**
Mobilization	7/1/2013
Installation of initial sediment & erosion control measures	6/30/2013
Rio Mesa 1 Commercial Operation	9/30/2015
Rio Mesa 2 Commercial Operation	12/30/2015
Rio Mesa 3 Commercial Operation	3/30/2016

4.1 Mobilization

The selected Contractor will mobilize and develop temporary construction facilities and laydown areas adjacent to the power block and the common area. Before starting the clearing and grading, the sediment and erosion control measures will be placed on site. Clearing and grubbing will start in the power block area.

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4.2 Heliostat Erection

Solar field erection works will require at least two pre-assembly sheds for assembling heliostat structures. Approximately 85,000 heliostats will need to be installed in each unit of Rio Mesa SEGF. Fabrication buildings will be used to assemble heliostats during all three construction phases. Once construction of Rio Mesa 3 is completed, the buildings will be removed and the area restored.

4.3 Power Block and Towers

Concrete, mechanical and electrical works of the power block will be performed after the immediate area is brought to its designated grade elevations.

The Common Area, located on the east boundary of the project site between Rio Mesa 2 and 3, will be used for the fabrication sheds and construction parking. It can be used for construction laydown if necessary. However, temporary laydown of materials at each site will generally occur in the vicinity of active construction work.

5 Best Management Practices

The project has been designed and staged during construction to minimize and confine impacts to only a small area at any given time, thereby limiting the amount of exposed soil. Construction is expected to proceed as expediently and efficiently as possible, thereby ensuring that as little soil is exposed for as short a time as possible. The following sections present standard construction BMPs, most of which are described in the *California Storm Water Best Management Practice Handbook* (CASQA, 2010 and 2003) and the Caltran Construction Stormwater BMPs guidelines in conjunction with the Caltran 2010 Standard Plans and Specifications. The fact sheets include the maintenance practices for each BMP. Figures 19 and 20 show the layout and details of the BMPs to be used for the Rio Mesa SEGF.

The following sections present the recommended construction BMPs for stormwater pollution prevention at the Rio Mesa SEGF construction laydown areas, plant site, and linear facilities. Each section provides information on BMP implementation as it relates to the activity being performed. BMPs that may have an impact on implementation of the DESCP will be reviewed by managers and construction contractors. While performing the work, the contractors may implement additional control measures if necessary to comply with permit requirements.

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5.1 General Erosion Control Measures

The objective of the erosion control measures is to impact as small an area as possible at any given time, thereby limiting the amount of exposed soil. BMPs will be used to help maintain water quality, protect property from erosion damage, and prevent accelerated soil erosion or dust generation. Temporary erosion control measures would be implemented before construction begins and they would be evaluated and maintained during construction. These measures typically include physical stabilization, dust suppression, berms, ditches, and sediment barriers. These measures would be removed from the site after the completion of construction.

To reduce erosion, project construction will minimize land disturbance by limiting construction activities only to areas that are essential to the installation and operation of the project. Grading is not intended to level the site, but rather to prepare the site for installation and future maintenance of the heliostats. Within the heliostat array fields, vegetation along the maintenance path will be cleared with a blade to clear the path. Scalping vegetation with a grader blade will likely go a couple inches into the soil and leave some of the existing root systems intact to anchor the soil at locations where the vegetation was cleared, reducing the potential for erosion. The vegetation within the heliostat field will be cut to an appropriate height to allow for the movement of the mirrors.

Extensive site grading consisting of cuts and fills will be limited to the power block areas, substation, common administrative area, heliostat assembly building area, major access roads and in heliostat field areas requiring improvements to grade for access. Vegetation removed by blading will be stockpiled for onsite or offsite disposal. Succulent plant species and selected sensitive and rare plant species would be salvaged, if necessary. Shrubs and other plant species would be revegetated by the collection of seeds, and re-seeding following decommissioning. Disking and light grading may be used prior to compaction by rolling in these specific areas. Disturbed soils will be compacted to reduce the rainfall absorptive capacity and vegetative productivity of the soils that are permanently covered by project facilities.

Non-active areas will be stabilized as soon as feasible after construction is complete and no later than 14 days after construction in that portion of the site has temporarily or permanently ceased.

It will be necessary to segregate and stockpile surface soils and organic matter during construction and excavation. In areas of substantial grading, native vegetation may be harvested for possible reuse to obtain long term soil stabilization. All excavated soils are to be reused during construction at the site to prevent subsequent erosion and sedimentation issues. Materials suitable for backfill will be stored in stockpiles at designated locations and be protected by the BMP designated for wind and water erosion impact.

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Potable water (groundwater) will be applied to disturbed soil areas of the project site to control dust and maintain optimum moisture levels for compaction as needed.

The access roads to individual plants will be paved from their point of connection to the 34th Ave. The 34th Ave, from its intersection with Interstate 78 to the project site, will also be paved. The public roadways will be maintained to minimize pollution from dust, dirt and debris caused by construction activities. These streets will be swept at the end of the day if visible soil materials are carried onto them.

The following general erosion and sediment control measures may be used during various phases of the project:

- Proper scheduling and sequencing of activities (EC-1):
  Each phase of the project must follow this practice throughout the entire construction period.
- Preservation of existing vegetation (EC-2):
  The existing vegetation, especially the rare species, should be preserve as possible on the site before the mobilization and during the construction period of project for the entire site.
- Geotextiles and mats(EC-7):
  This measure may be applied to the excavated area to protect against rainfall erosion during the construction period. Geotextiles will be applied to the slope of berm at power block and switchyard for long term erosion control.
- Earth dikes and drainage swales (EC-9):
  This measure will be applied to power block and the Common Area for flood protection, but may also be applied during construction for temporary drainage control.
- Velocity dissipation devices (EC-10):
  This control measure will be applied to each diversion channel outlet and drainage outlet at power block and the Common Area. The measure will be used for both temporary and permanent facilities.
- Silt fences and fiber rolls (SE-1 and SE-5):
  Silt fences will be used for sediment control during the construction period. Fiber rolls will be applied as check dams on drainage swales and on cut and fill slopes to control long runs of sheet flows.
- Stockpile management (WM-3):
  This measure will be applied to control the stormwater pollution and dust from stockpiles of construction materials and soils.

5.1.1 Access Road, Entrance and Parking, and Laydown Areas/ Offsite Vehicle Tracking

Controls will be in place to minimize or eliminate soils from being tracked off the project site from vehicles. Primary access to the site is via the 34th Ave interchange on I-78. The 34th Ave will be paved from its intersection Interstate 78 to the project site. In addition,

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the access roads to individual plants will be paved from their point of connection to the main access road to the project site. A stabilized entrance/exit and a wheel wash facility will be provided to clean vehicle wheels prior to exiting the construction area.

The parking and laydown areas will be stabilized with coarse gravel. All surfaces will be regularly watered to reduce generation of dust, but will not be excessively watered so as to generate runoff. As shown in Figures 15 to 18, silt fences or fiber rolls will be used at edges of these areas, as necessary to minimize sediment discharging into swales or ditches.

All public roadways will be maintained regularly to minimize pollution from dust, dirt and debris caused by construction activities. These streets will be swept at the end of the day if visible soil materials are carried onto them.

The following control methods will be considered for offsite vehicle tracking, as necessary.

- Stabilized construction entrance/exit (TC-1)
- Stabilized construction roadway (TC-2)
- Tire wash (TC-3)
- Entrance/exit Street sweeping (SE-7)
- Paving and grinding operations (NS-3)

5.1.2 Dust Suppression and Control

During construction of the project and the related linear facilities, dust erosion control measures would be implemented to minimize the wind-blown loss of soil from the site. Potable water (groundwater) will be applied to disturbed soil areas of the project site to control dust and maintain optimum moisture levels for compaction as needed, but will not be excessively watered so as to generate runoff.

The following control method will be considered for dust suppression, as necessary:

- Wind erosion control (WE-1)
- Water conservation practices (NS-1)

5.1.3 Rio Mesa SEGF Site and Linear Facilities

The power block area for each phase will be graded with moderate slopes to direct runoff to outlets with oil/water separator before overflowing through rip-rap to reinstate natural sheet flow conditions.

Overall the project is being designed to maintain, to the extent possible, the existing sheet flow patterns on the site.

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Sediment control barriers like silt fence would be placed in locations where offsite drainage could occur to prevent sediment from leaving the site. When used, sediment barriers would be properly installed, then removed after construction. Any soil stockpiles, including sediment barriers around the base of the stockpiles, would be stabilized and covered.

Primary access to the site is via the 34th Ave interchange on Interstate 78. The 34th Ave will be paved from its intersection with Interstate 78 to the project site. In addition, the access roads to individual plants will be paved from their point of connection to the 34th Ave. A stabilized entrance/exit and a wheel wash facility will be provided to clean vehicle wheels prior to exiting the construction area.

Two evaporation ponds, with an area of 2 acres each, are located east of the administration building. Description about their operation can be found in Sections 1.3.4 and 1.3.6. Runoff detention basins and other large-scale sediment traps are not considered necessary due to the low rainfall amount and the low impact development approach for the site.

5.1.4 Site Stabilization and Demobilization

As construction nears completion, areas used for temporary parking, storage and laydown will be cleared and stabilized. Areas that will continue to be used for parking or storage will have permanent storm water collection and conveyance structures provided.

Within the heliostat array fields, vegetation in every maintenance path will be cleared with a blade. Scalping vegetation with a grader blade will likely go a couple inches into the soil and leave some of the existing root systems intact to anchor the soil at locations where the vegetation was cleared, reducing the potential for erosion.

Heliostats are relatively small (about 13 feet high each), contain no hazardous materials, and are not essential structures. Their potential structural failure in flood conditions also does not pose a risk to personnel, and the heliostat fields therefore require no special flood protection measures. Onsite water consumption will be minimal—mainly to replace boiler feedwater blowdown and provide deionized water for washing heliostats. The latter is required in a washing cycle of 2 weeks, during which all heliostats are washed, to maintain them at full performance. Because of dust created during site grading, the washing cycle potentially may be more frequent (but not likely more than double) when one solar unit is operating while another unit site area is being graded. This situation would be limited to an about 3-month period when Rio Mesa 1 is operational, while Rio Mesa 3 is being graded.

Paved access roads will be protected from floods via ditches, culverts and local fords with reinforced concrete shoulders. Routine vehicle traffic during project operation would be limited to existing roads, most of which will be paved or covered with gravel.

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Access routes will also be graded between the heliostat arrays to permit bi-weekly washing of the mirrors with a pick-up truck-mounted tanker and the occasional blading of vegetation due to plant re-growth. Standard operating activities would not involve the disruption of soil. When linear facilities need to be inspected or maintained, vehicle traffic near these areas would be minimized.

5.2 Other Controls

Rio Mesa SEGF will use hazardous materials during construction, such as vehicle fluids, including oil, grease, petroleum, and coolants, paints, solvents and curing compounds. The project will comply with good engineering practices, applicable laws and regulations for the storage of these materials to minimize the potential for a release of hazardous materials, and will conduct emergency response planning to address public health concerns regarding hazardous materials use and storage.

5.2.1 Material Handling and Storage

All construction equipment will be maintained to control leaks and spills, and fueling will only be conducted within contained areas. Any contaminated soils resulting from spills will be dug up as quickly as possible, and then removed from the site for proper disposal.

There will be a variety of chemicals stored and used during the construction of Rio Mesa SEGF. All hazardous materials will be handled and stored in accordance with applicable codes and regulations. Hazardous material management during the construction phase will be addressed in the pending Hazardous Material Management Plan. In addition, a Hazardous Materials Business Plan (operational focus) will be developed in accordance with California Code of Regulations Title 19 and the Health and Safety Code (Section 25504). The Hazardous Materials Business Plan will include an inventory and location map of operational hazardous materials onsite and an emergency response plan for hazardous materials incidents. Specific topics to be covered in the plan include:

- Facility identification
- Emergency contacts
- Chemical inventory information (for every hazardous material above threshold limits)
- Site map
- Emergency notification data
- Procedures to control actual or threatened releases
- Emergency response procedures
- Training procedures
- Certification

The Hazardous Materials Business Plan (for operational materials) will likely be filed with the Riverside County Department of Environmental Health (DEH) and updated

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annually in accordance with applicable regulations. The Riverside County DEH will ensure review by and distribution to other potentially affected agencies including the local fire district.

The quantities of hazardous materials that will be onsite during construction will generally be limited to gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, various lubricants, paint, and paint thinner. There are no feasible alternatives to vehicle fuels and oils for operating construction equipment. The types of paint required are dictated by the types of equipment and structures that must be coated and by the manufacturers' requirements for coating.

The following BMPs will be considered for material handling and storage:

- Vehicle and equipment cleaning (NS-8)
- Vehicle and equipment refueling (NS-9)
- Vehicle and equipment maintenance (NS-10)
- Material delivery and storage (WM-1)
- Material use (WM-2)
- Spill prevention and control (WM-4)

5.2.2 Foundations

During construction of the foundations, a concrete washout area will be required. The concrete washout area will be located near the main entrance to the Rio Mesa project site, and will be at least 50 feet away from major drainages (Figure 18). Dumping of excess concrete and washing out of delivery vehicles will be prohibited at other locations onsite. Notices will be posted to inform all drivers.

The following BMPs will be considered during the construction of foundations:

- Concrete waste management (WM-8)
- Concrete curing (NS-12)

5.2.3 Solid and Hazardous Waste Management

A Construction Waste Management Plan will likely be developed to addresses the onsite storage, handling and management of all solid wastes generated at the Project site during construction and start-up including non-hazardous, hazardous, and sanitary wastes including special wastes destined for recycling (e.g., used oil, used oil filters, used welding rods, scrap metal). The Owner will retain responsibility for any existing wastes above or below ground at the project site, as well as any wastes generated as part of operational activities after care, custody and control of the Project have been transferred to the Owner.

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The types of waste that are expected to be generated during the course of construction are described below.

5.2.3.1 Nonhazardous Solid Waste

Listed below are nonhazardous wastes that could potentially be generated from construction activities.

Paper, Wood, Glass, and Plastics. Paper, wood, glass, and plastics will be generated from packing materials, waste lumber, insulation, and empty nonhazardous chemical containers during project construction. These wastes will be recycled where practical. Waste that cannot be recycled will be disposed of weekly in a Class III landfill. Onsite, the waste will be placed in dumpsters.

Concrete. Waste concrete will be disposed of in a Class III landfill or at clean fill sites, if available or will be recycled and disposed of at a construction and demolition site. As discussed in Section 5.2.2, an onsite concrete washout area is located near the main entrance to the site. Concrete washout facility will be maintained to provide adequate holding capacity with a minimum freeboard of 12 inches (for below grade type). Hardened concrete will be removed and disposed following Caltran standard Specification Section 7-1.13 or 15-3.02. The Concrete Waste Management (WM-8) BMP will be imposed to prevent pollutant from waste concrete.

Metal. Waste metal, including steel from welding/cutting operations, packing materials, and empty nonhazardous chemical containers, and aluminum waste from packing materials and electrical wiring will be recycled where practical and nonrecyclable waste will be deposited in a Class III landfill.

5.2.3.2 Wastewater

Wastewater generated during construction will include stormwater runoff, pressure testing water if needed, and equipment washdown water. Depending on the chemical quality of these wastewaters, they could be classified as hazardous, pollutant to surface or groundwater or no threat to surface and groundwaters. The waste waters may be subject to sampling. Water that represent a threat to ground or surface waters or are characterized as hazardous would be disposed of in accordance with applicable regulations.

5.2.3.3 Hazardous Waste

Most of the hazardous waste generated during construction will consist of liquid waste, such as water from flushing and cleaning fluids, passivating fluid (to prepare pipes for use), and solvents. Some hazardous solid waste, such as welding materials, batteries, and dried paint, may also be generated.

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Flushing and cleaning waste liquid will be generated as pipes are cleaned and flushed. The volume of flushing and cleaning liquid waste generated is estimated to be one to two times the internal volume of the pipes cleaned. The quantity of welding, solvent, batteries, and paint waste is expected to be minimal. Wastewaters generated during construction could also be considered a threat to ground and surface waters or characterized as hazardous, if demonstrated so by sampling.

The construction contractor will be considered the generator of hazardous construction waste and will be responsible for proper handling of hazardous waste in compliance with all applicable federal, California and Riverside County and regulations. This responsibility will include licensing, personnel training, accumulation limits and times, and reporting and recordkeeping.

The hazardous waste will be collected in satellite accumulation containers near the points of generation. It will be moved daily to the contractor's 90-day hazardous waste storage area located within the site construction laydown area. The waste will be removed from the site by a certified/licensed hazardous waste collection company and delivered to an authorized hazardous waste management facility, before expiration of the 90-day storage limit.

The following BMPs will be considered at the designated storage locations:

- Cover or store hazardous materials indoors, if possible (WM-1)
- Material delivery and storage (WM-1)
- Material use (WM-2)
- Stockpile management (WM-3)
- Spill prevention and control (WM-4)
- Solid waste management (WM-5)
- Hazardous waste management (WM-6)
- Sanitary/Septic Waste Management (WM-9)
- Liquid Waste Management (WM-10)

5.2.4 Potential Contaminated Soil

The project area is characterized by a desert scrub community dominated by creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). The ground surface is primarily comprised of coalesced and dissected alluvial fans and desert washes. It is unlikely that, with exception of light cattle grazing, there has been any other historical use of the site. Soils in the area are not expected to be contaminated. No existing site features have, as a result of past usage, contributed pollutants to stormwater (e.g., toxic materials that have been treated, stored, disposed of, spilled, or leaked onto the construction site).

As such, it is unlikely that contaminated soil will be encountered during construction. However, operators and construction personnel will be asked to report unusual conditions

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to the appropriate personnel and the area and/or material will be properly contained during investigative actions. As described earlier, the Owner will be responsible for management of pre-existing site contamination including contaminated soils.

If soils (contaminated by construction activities) require temporary stockpiling, piles will be placed on and covered with plastic sheeting or tarps that are secured safely with sand bags and bermed with fiber rolls or silt fencing to prevent runoff from leaving the area. If required, samples will be collected and sent to a certified analytical laboratory for characterization. If contamination is detected, the waste will be handled and properly disposed of in an authorized waste management facility.

The following BMP will be considered:

- Contaminated Soil Management (WM-7)

5.2.5 Groundwater/Dewatering Controls

It is unlikely that groundwater will require removal during the construction phase of Rio Mesa SEGF because the groundwater table is believed to be located substantially below the maximum excavation depth. There is no need for dewatering associated with groundwater or storm water. But dewatering may be needed for non-stormwater discharges (e.g. hydrotesting, pipe flushing, etc) during the construction. The collected non-stormwater will be handled and properly disposed of in a manner consistent with federal, state, and local regulations. The following control methods will be considered for groundwater/dewatering controls, as necessary:

- Dewatering operations (NS-2)

6 References

1. California Stormwater Quality Association (2010). California Stormwater Best Management Practices Handbook – Construction.

2. California Stormwater Quality Association (2003). California Stormwater Best Management Practices Handbook – Industrial and Commercial.

3. California Department of Water Resources (DWR), 2003. California's Groundwater – Bulletin 118. Basin Descriptions: Palo Verde Mesa Groundwater Basin. http://www.water.ca.gov/groundwater/bulletin118/update2003.cfm

4. U. S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Hydrometeorological Study Center, Precipitation Frequency Data Server (PFDS), Silver Spring, MD 2006.

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Website: (Accessed 9/18/2011)
http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

5. California State Water Resources Control Board (2009). National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities. Order No. 2009-0009-DWQ, NPDES NO. CAS000002.

6. Riverside County, California, "Stormwater Quality Best Management Practice Design Handbook", Riverside County Flood Control and Water Conservation District, 1995 Market Street, Riverside CA 92501, Dated July 21, 2006

7. Ninyo & Morre, Geotechnical and Environmental Sciences Consultants, "Preliminary Geotechnical Evaluation, Rio Mesa Solar Facility, Bradshaw Trail and West Avenue, Riverside County, California", Dated June 8, 2011

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7 Appendices

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Appendix 1

Figures

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Appendix 2

Technical Memorandum

1. **Technical Memorandum – Rio Mesa Solar – Final Post Construction Hydrologic & Hydraulic Analysis**
2. **Technical Memorandum – Rio Mesa Solar – Overall Existing Condition Hydrologic & Hydraulic Analysis**
3. **Technical Memorandum – Rio Mesa Solar – Final Erosion, Scour, and Sediment Transport Analysis**

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Appendix 3

Risk Level Determination in accordance with Appendix 1 of the California Construction General Permit Order 2009-0009-DWQ adopted on September 2, 2009

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The risk of accelerated erosion and sedimentation from wind and water depends on a number of factors, including proximity to receiving water bodies, climate, topography, and soil type. Construction General Permit Order 2009-0009-DWQ requires dischargers to assess the risk level of a site based on both sediment transport and receiving water risk. Risk levels are established by determining two factors: first, the site's sediment risk; and second, receiving water risk during periods of soil exposure (i.e., grading and site stabilization). Both factors are used to determine the combined site-specific Risk Level.

The risk level of the Rio Mesa Solar Electric Generating Facility (RMSEGF) project is determined using of the Risk Determination Worksheet contained in Appendix 1 of the 2009 Construction General Permit Order.

Step 1: Determine Sediment Risk via Option 1 (GIS Map Method - EPA Rainfall Erosivity Calculator & GIS map)

Under Option 1, the Rainfall Erosivity Factor (R) for Rio Mesa site is determined to be 29.14, with the aid of the EPA online Erosivity Index Calculator (accessed at web link http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm) as shown in the following page. The start date of earth disturbance is June 30, 2013 based on schedule start of the earthwork activities for the first unit. The end date of March 30, 2016 for final site stabilization is conservatively tied to the start of commercial operation for the third (last) unit. The latitude (33.4595^{o} N) and longitude (114.7833^{o} W) of the existing radio tower on site is used to represent the facility location.

The soil erodibility factor (K) is estimated to be 0.14 and the product of hillslope length (L) and gradient (S), i.e., LS, for the RMSEGF site is estimated to be 0.202 from the GIS maps published by the State Regional Water Quality Control Board as shown in the figures below.

The watershed erosion estimate or soil loss can be determined by multiplying the R factor and the product of K and LS factors (i.e., the RKLS factor), which is found to be 8.24 tons per acre. The site Sediment Risk Factor is therefore determined to be LOW because the estimated soil loss of 8.24 tons per acre is less than 15 tons per acre, as shown in the Sediment Risk Factor worksheet below.

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Rainfall Erosivity Factor Calculator for Small Construction Sites

Facility Information

Facility Name: Rio Mesa SEGF
Start Date: 06/30/2013
End Date: 03/30/2016
Latitude: 33.4595
Longitude: -114.7833

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF 29.14 HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF **06/30/2013 - 03/30/2016**.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do not qualify for a waiver from NPDES permitting requirements.**

Start Over

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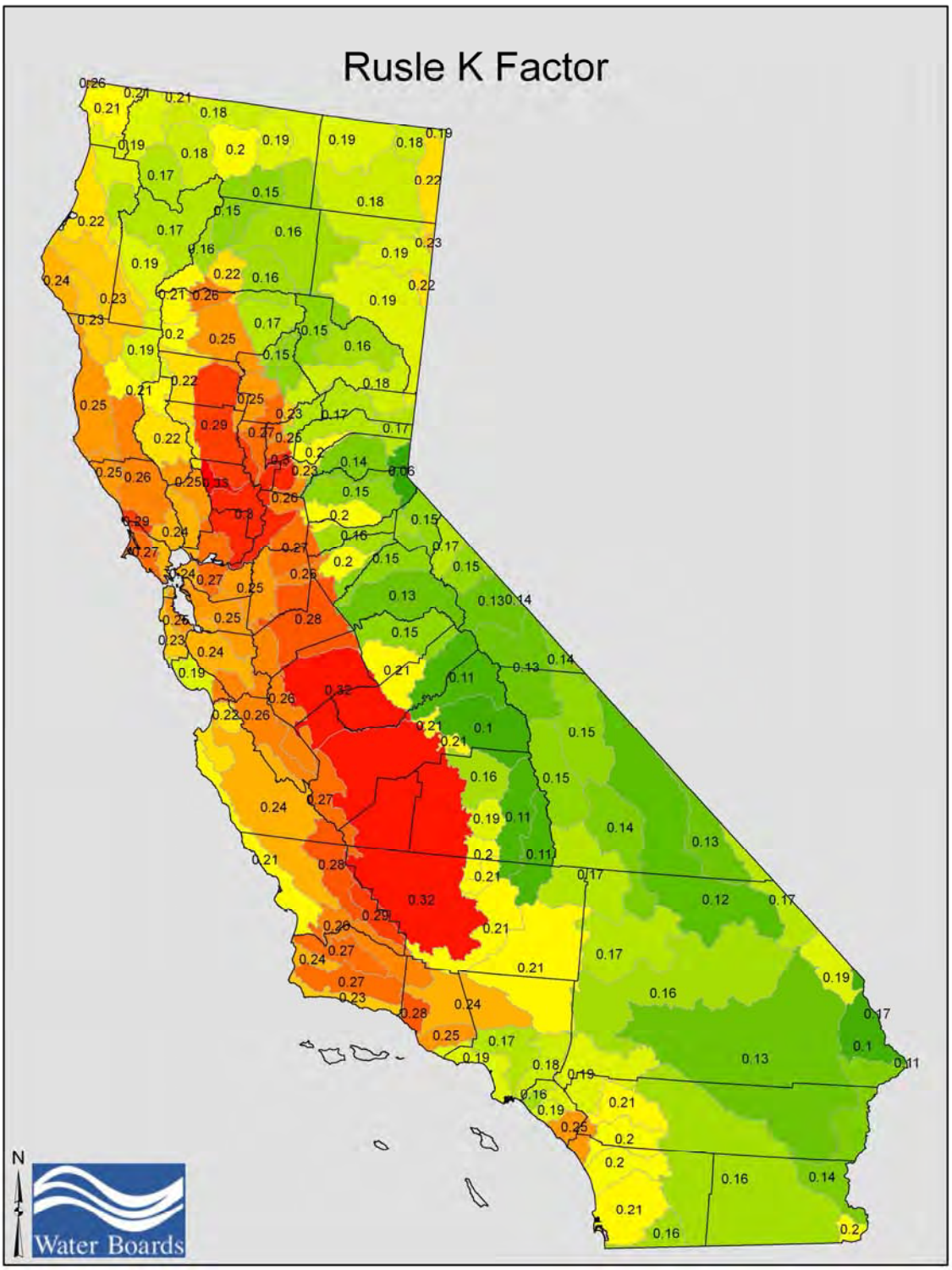

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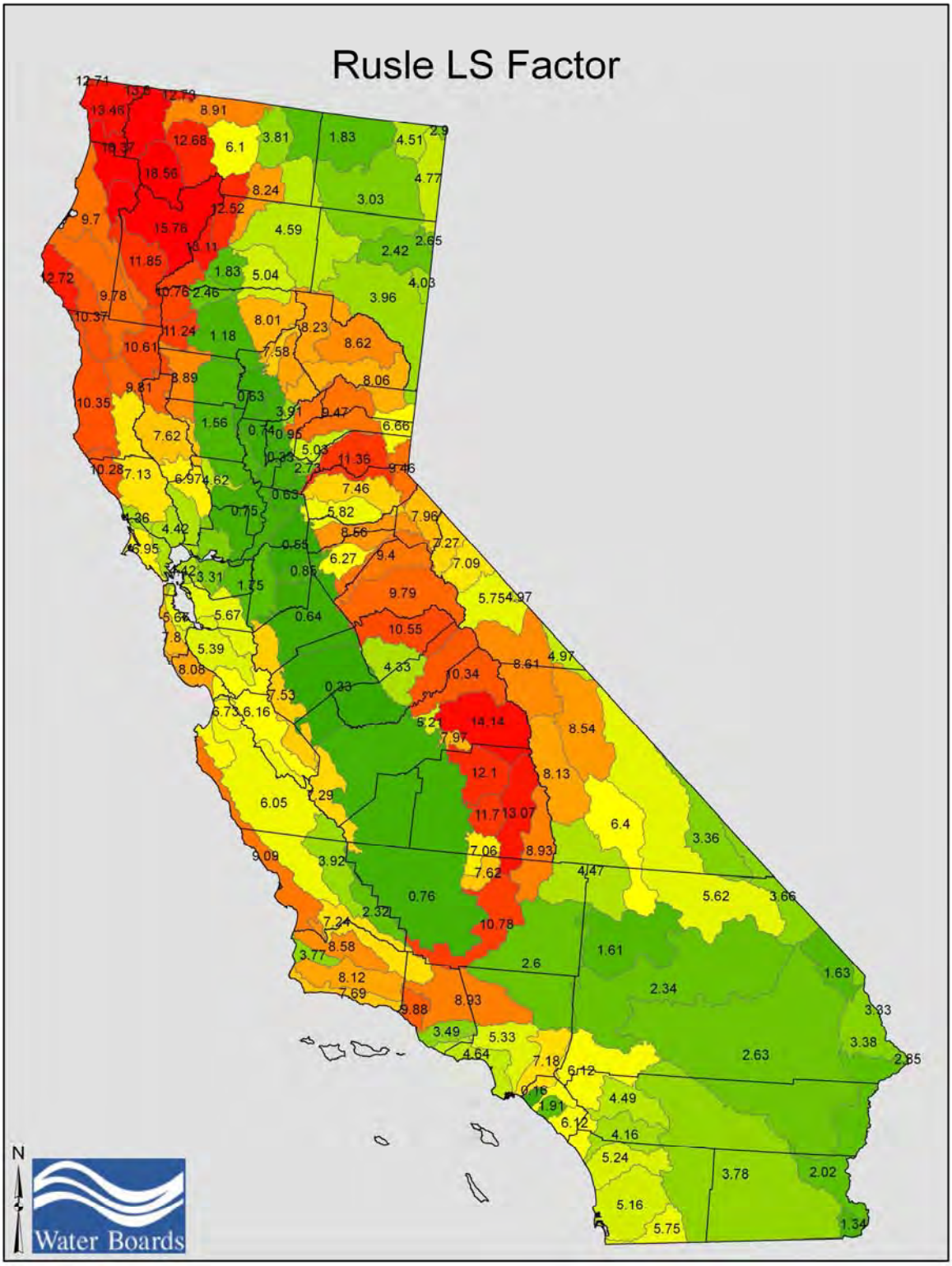

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	A	B	C
1	**Sediment Risk Factor Worksheet**		**Entry**
2	**A) R Factor**		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
5		**R Factor Value**	29.14
6	**B) K Factor (weighted average, by area, for all site soils)**		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	Site-specific K factor guidance		
9		**K Factor Value**	0.14
10	**C) LS Factor (weighted average, by area, for all slopes)**		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	LS Table		
13		**LS Factor Value**	2.02
14			
15	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**		8.24
16	**Site Sediment Risk Factor**		**Low**
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			

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Step 2: Determine Receiving Water Risk using the list of Sediment Sensitivity Watersheds provided

According to the latest list of sediment-impaired watersheds provided in the worksheet, the disturbed areas of the RMSEGF project site as well as the planning watershed where the site is located will not discharge (either directly or indirectly) to a 303(d)-listed waterbody impaired by sediment. In addition, the disturbed area of the RMSEGF project site will not discharge to any waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY. This finding is consistent with the Receiving Water Risk GIS map published by the State Regional Water Quality Control Board. Consequently, the Receiving Water (RW) Risk Factor is determined as LOW as shown in the table below.

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
A. Watershed Characteristics	yes/no	
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment**? For help with impaired waterbodies please check the attached worksheet or visit the link below: 2006 Approved Sediment-impared WBs Worksheet http://www.waterboards.ca.gov/water_issues/programs/tmdl/303d_lists2006_epa.shtml	No	Low
OR		
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? http://www.ice.ucdavis.edu/geowbs/asp/wbquse.asp		

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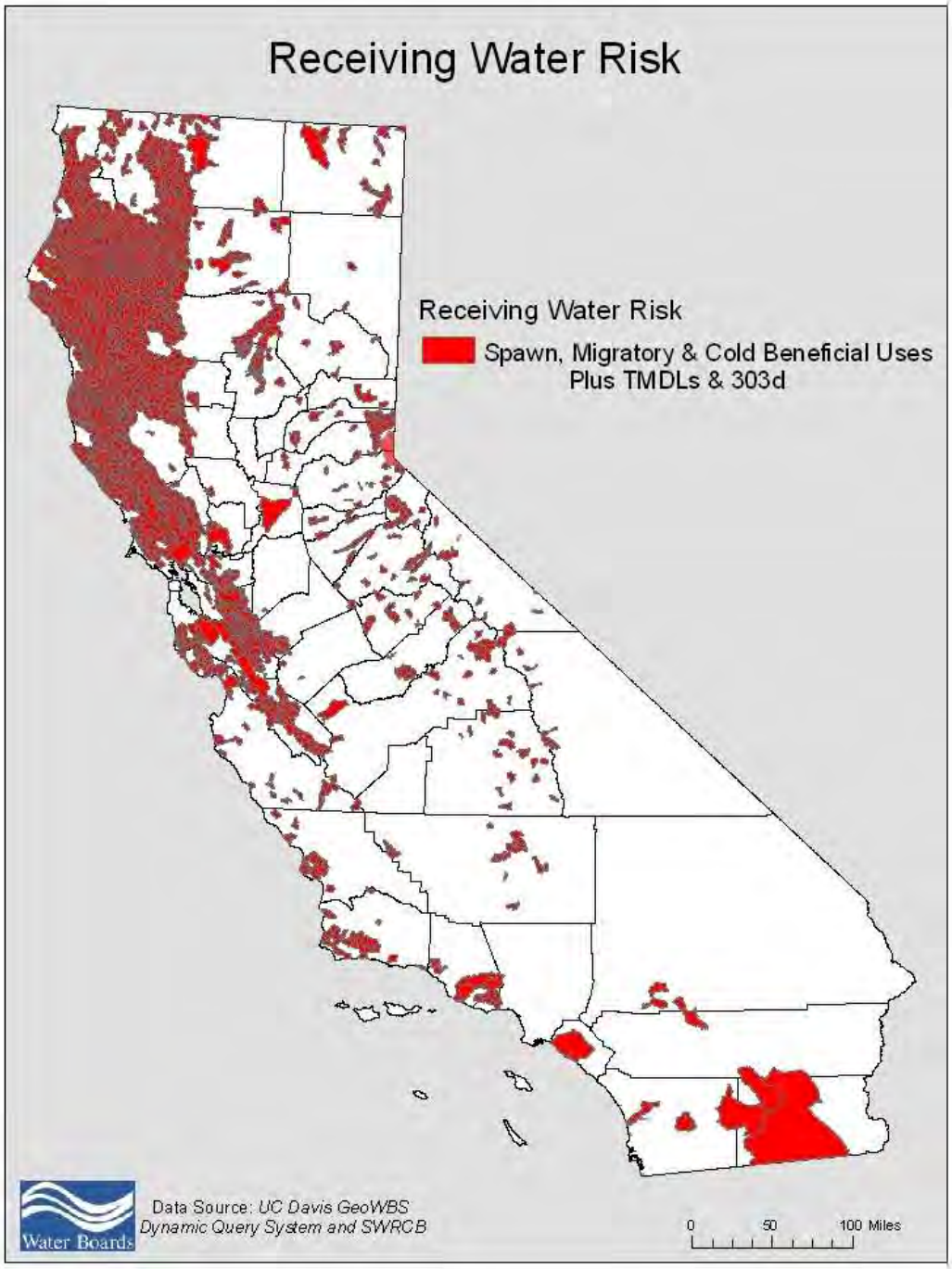

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Step 3: Determine Combined Risk Level

With the assessment of low risk on both sediment transport and receiving water, the combined risk for the RMSEGF project is determined to be Level 1.



Project Sediment Risk: Low
Project RW Risk: Low
Project Combined Risk: Level 1

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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 2/27/12)

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*indicates change

DECLARATION OF SERVICE

I, Andrew Martin, declare that on March 8, 2012, I served and filed copies of the attached, dated March 8, 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:

X Served electronically to all e-mail addresses on the Proof of Service list;

X 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:

X 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.

Original Signed by Andrew Martin

*indicates change

CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CA 95814-5512
www.energy.ca.gov

TO: *All Parties* *Date: February 27, 2012*

RE: ***RIO MESA SOLAR ELECTRIC GENERATING FACILITY***
Proof of Service List
Docket No. 11-AFC-04

Attached is the ***newly revised*** Proof of Service List for the above-mentioned project, current as of February 27, 2012. Please pay particular attention to the ***new*** filing instructions.

Energy Commission regulations (Cal. Code Regs., tit. 20, § 1210) require, in addition to any electronic service, that a paper copy be served in person or by first class mail except where a party requests to receive an electronic copy when one is available. Individuals and groups on the Proof of Service list who prefer to receive filings by e-mail and do not require a paper copy shall inform the Hearing Adviser assigned to the proceeding.

The Proof of Service list for this matter will delineate those individuals and groups and it is sufficient to serve those individuals with an e-mailed copy only. Those not so delineated must be served with a paper copy in addition to any e-mailed copy that the filing party chooses to provide. Signatures may be indicated on the electronic copy by **"*Original Signed By*"** or similar words. The original signed copy or an electronic copy shall be filed with the Energy Commission's Dockets Unit.

Unless otherwise specified in a regulation, all materials filed with the Commission must also be filed with the Docket Unit. (Cal. Code Regs., tit. 20, § 1209(d).) Some regulations require filing with the Commission's Chief Counsel instead of the Docket Unit. For example, Section 1720 requires a petition for reconsideration to be filed with the Chief Counsel and served on the parties. Service on the attorney representing Commission staff does not satisfy this requirement. This Proof of Service form is not appropriate for use when filing a document with the Chief Counsel under Title 20, sections 1231 (Complaint and Request for Investigation) or 2506 (Petition for Inspection or Copying of Confidential Records). The Public Advisor can answer any questions related to filing under these sections.

New addition(s) to the Proof of Service are indicated in **bold font** and marked with an asterisk (*). Additionally, if two or more persons are listed on a Proof of Service List with a single address, only one physical copy of a document need be mailed to the address.

Use this newly revised list for all future filings and submittals. This Proof of Service List will also be available on the Commission's Project Web Site at:

[http://www.energy.ca.gov/sitingcases/riomesa/index.html]

Please review the information and contact me at sharris@energy.state.ca.us or (916) 654-3893, if you would like to be removed from the Proof of Service or if there are any changes to your contact information.

Sandra Harris
Hearing Adviser's Office

Attachment