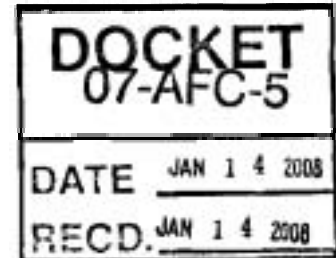




**CH2M HILL**  
2485 Natomas Park Drive  
Suite 600  
Sacramento, CA 95833  
Tel 916.920.0300  
Fax 916.920.8483

January 14, 2008  
357891



Mr. Jack Caswell  
California Energy Commission  
Systems Assessment and Facilities Siting Division  
1516 9th Street, MS 15  
Sacramento, CA 95814-5504

RE: Data Response, Set 1A  
Ivanpah Solar Electric Generating System (07-AFC-5)

Dear Mr. Caswell:

On behalf of Solar Partners I, LLC, Solar Partners II, LLC, Solar Partners IV, LLC, and Solar Partners VIII, LLC, please find attached one original and 12 hard copies of Data Response, Set 1A, which addresses Staff's data requests dated December 12, 2007.

Included in this submittal are 5 sets of the System Impact Study for Ivanpah 2 in response to Data Request 93.

Please call me if you have any questions.

Sincerely,

CH2M HILL  
  
John L. Carrier, J.D.  
Program Manager

c: POS List  
Project File

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# **Ivanpah Solar Electric Generating System (ISEGS)**

**(07-AFC-5)**

## **Data Response, Set 1A**

**(Response to Data Requests 1 through 116)**

Submitted to the  
**California Energy Commission**

Submitted by  
**Solar Partners I, LLC; Solar Partners II, LLC; Solar Partners IV, LLC;  
and Solar Partners VIII, LLC**

January 14, 2008

With Assistance from

**CH2MHILL**  
2485 Natomas Park Drive  
Suite 600  
Sacramento, CA 95833

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# Introduction

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Attached are Solar Partners I, LLC, Solar Partners II, LLC, Solar Partners IV, LLC, and Solar Partners VIII, LLC (Applicant) responses to the California Energy Commission (CEC) Staff's data requests numbers 1 through 116 for the Ivanpah Solar Electric Generating System (Ivanpah SEGS) Project (07-AFC-5). The CEC Staff served these data requests on December 12, 2007, as part of the discovery process for Ivanpah SEGS. The responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as CEC Staff presented them and are keyed to the Data Request numbers (1 through 116). New graphics or tables are numbered in reference to the Data Request number. For example, the first table used in response to Data Request 15 would be numbered Table DR15-1. The first figure used in response to Data Request 15 would be Figure DR15-1, and so on. AFC figures or tables that have been revised have "R1" following the original number, indicating revision 1.

Additional tables, figures, or documents submitted in response to a data request (supporting data, stand-alone documents such as plans, folding graphics, etc.) are found at the end of a discipline-specific section and may not be sequentially page-numbered consistently with the remainder of the document, though they may have their own internal page numbering system.

The Applicant looks forward to working cooperatively with the CEC and BLM staff as the Ivanpah SEGS Project proceeds through the siting process. We trust that these responses address the Staff's questions and remain available to have any additional dialogue the Staff may require.



# Project Description (1 – 6)

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## Background

In Section 2.0 Project Description, page 2-3, 2.2.1 of the Application for Certification (AFC) under the 2.2 Generating Facility Description, Design, and Operation section heading, you have requested a right-of-way use permit for 7,040 acres of land within the project's property boundary from the Bureau of Land Management (BLM). The project operations require 3,400 acres of land as identified in the same section. Staff is unclear on the project's need for such a large land use request given the project's construction and operational needs.

## Data Request

1. Please provide a justification for requesting a right-of-way use permit for 7,040 acres of land from the BLM when the AFC identifies 3,400 acres necessary for the plant construction and operation.

**Response:** Applicant filed (and subsequently amended) a SF 299 application with the Needles Field Office of the BLM for a total acreage of approximately 7,040 acres for the Ivanpah SEGS project. At the time of filing, Applicant was aware that this entire acreage would not ultimately be needed for the Ivanpah SEGS project but did so to accommodate potential changes in project layout to minimize the project's environmental footprint as the project proceeded through pre-application site investigation and the 6 months of AFC preparation. This additional acreage also allows the Applicant to, in essence, use this land should unforeseen circumstances arise during licensing (e.g., use of the land for possible mitigation, additional laydown area). That said, at this point Applicant foresees obtaining a right-of-way from BLM for only 3,400 acres at the end of the CEC/BLM licensing process.

2. Per your justification for the 7,040 acres requested from the BLM, please provide a detailed identification of all construction and ground disturbance activities that will be conducted on the additional 3,640 acres request.

**Response:** See Data Response 1.

3. Provide a detailed discussion for all measures intended for mitigating impacts from the project's construction and ground disturbance activities on the additional 3,640 acres.

**Response:** See Data Response 1.

## Background

Plan of Development, 2.2 Process Description cites "Additional heliostats would be located outside the power block perimeter road, focusing on the reheat tower. Their

locations are not shown on the drawings, because they would be finalized only after power block equipment outlines and elevations are finalized.”

4. Cite maximum acreage and location of “additional” heliostats located outside the power block road and plot area on the project maps.

**Response:** The statement refers only to the Ivanpah 3 plant of 200MW, the intention being to install additional heliostats inside the area formed between the four solar fields, as shown on the attached drawing Figure DR4-1. This area (excluding the power block) is approximately 101.2 acres and is included as part of the project’s 3,400-acre total.

## **Background**

Plan of Development, 2.15.2 Construction Sequencing, Site Disturbance state that ephemeral channel banks would require minimal grading. Site Stabilization cites that relatively small rock filters and local diversion berms through the solar fields would discourage water from concentrating to maintain sheet flow. Demobilization cites that a batch plant would be established outside plant entrance gate.

## **Data Request**

- 5.a. Describe and plot the location and dimensions of the batch plant,

**Response:** Since the Applicant is no longer planning to use pre-cast heliostat bases (see Data Response 66), we have determined that a batch plant is no longer needed for this project.

- 5.b. Describe measures to prevent off site discharge of waste effluent.

**Response:** All industrial waste systems will be located within the power block area of each plant, not in the heliostat fields. All systems that contain waste material or fluid will be located with curbed areas to prevent groundwater contamination. Domestic waste treatment systems will be located adjacent to the plant control rooms and the common administration building. The treatment waste systems will be located within a curbed area or will include secondary containment within the skid package. No other waste effluent sources are anticipated as part of this project.

## **Background**

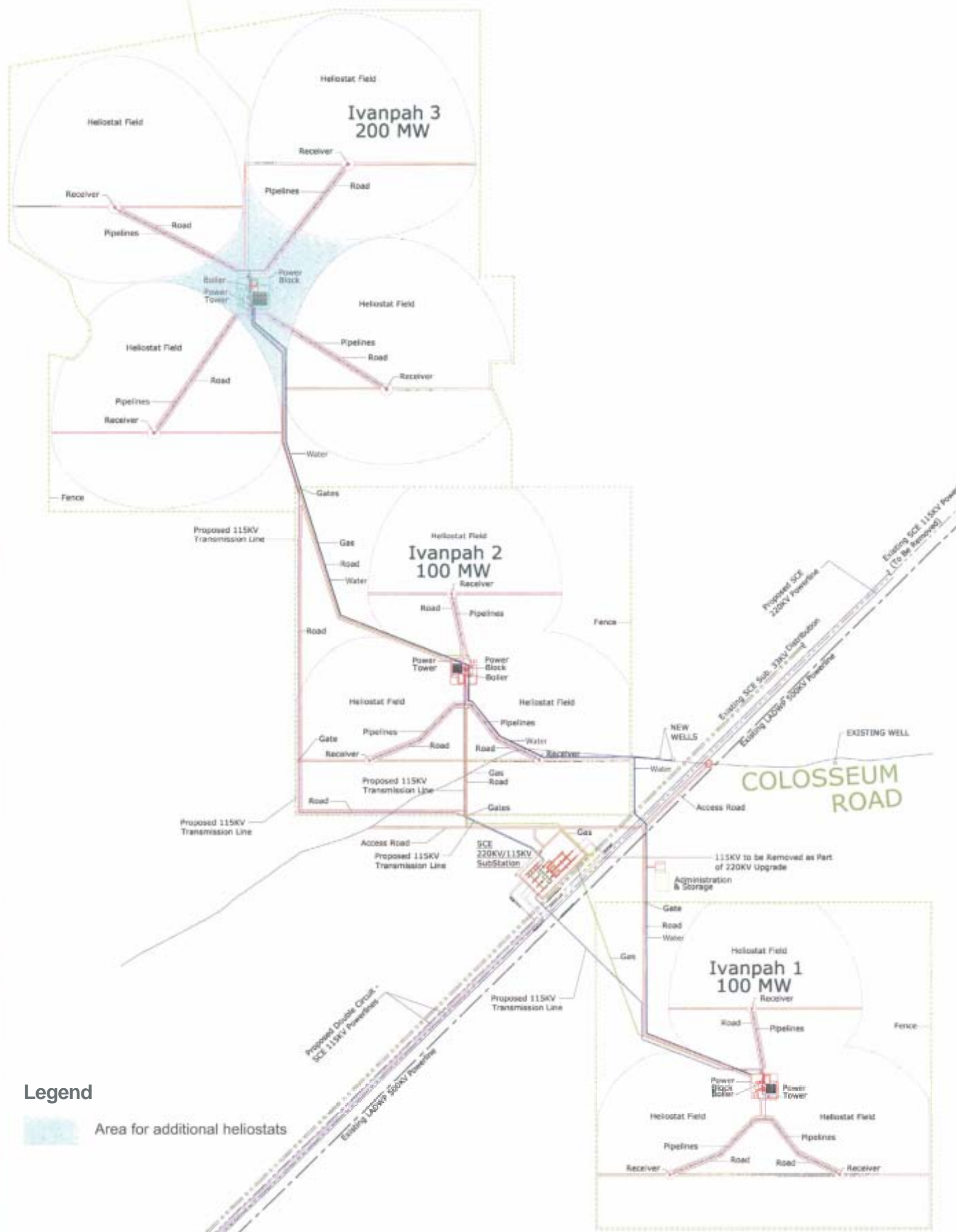
Plan of Development, 2.15.3 Distributed Power Tower and Heliostat Erection cites that excavation spoils would be stored in an approved area of the site. Heliostat Construction cites a pre-casting shed would be adjacent to the batch plant, outside the plant entrance.

**Data Request**

6. Describe and plot spoils storage location, confirming the location would be located within the proposed project footprint or an added acreage.

Response: The site will be a "balanced" site, meaning no soil will be brought in or taken off the site. Spoil storage will be located in the eastern fill area of each Power Block, which is within the proposed project footprint. As stated in Applicant's December 28, 2007 letter, an additional 30 days has been requested to respond to this data request. The spoil storage location (i.e., fill area) will be designated on the drawing to be provided by February 11, 2008.

KERN RIVER GAS TRANSMISSION LINE  
INTERCONNECT PT.



**Legend**  
Area for additional heliostats

SOURCE: LUZ II DRAWING NO. 01-GE-D-D-003  
REVISION L

**FIGURE DR4-1  
AREA FOR ADDITIONAL  
HELIOSTATS**  
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

# Air Quality (7 – 12)

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## Background

### Facility Operational Emissions

The AFC does not appear to document or estimate emissions from vehicles and equipment used to provide maintenance of the solar mirrors. For examples, there is no mention of the frequency of washing the mirrors and whether associated vehicle and equipment activity would cause emissions of NO<sub>x</sub>, VOC and PM<sub>10</sub>, and how much. Thus, the facility operational emissions may not be fully quantified.

## Data Request

7. Please provide a description of the facility maintenance activities, including, but not limited to, cleaning the solar mirrors, vegetation suppression, grading if any, reapplication of dust suppressants, and the number of equipment and/or vehicles utilized for such activities.

**Response:** Mirror washing will employ a high-pressure system using demineralized quality water, by means of a tractor-pulled trailer that contains a water tank, positive displacement water pumps that deliver water at high-pressure, and spray nozzles operated by the cleaning crew. This system will use approximately 0.16 gallons of water per square meter of mirror. The washing is expected to be done on a 2-week rotating cycle using about 6 trailers for the 100 MW plants and 12 trailers for the 200 MW plant.

Due to the nightly tractor-pulled trailers along the heliostat rows we do not expect any need for vegetation suppression or grading activities as part of the maintenance program.

8. Provide an estimate of emissions of NO<sub>x</sub>, VOC and PM<sub>10</sub>, including fugitive PM<sub>10</sub>, cause by the maintenance equipment, vehicles and activities.

**Response:** Two components contribute to emissions from site maintenance activities: combustion emissions from vehicles, and fugitive dust from driving over unpaved surfaces.

The following table presents the emissions associated with site maintenance activities:

Combustion emission factors were taken from EMFAC 2002 v2.2, light duty trucks (gasoline and Diesel), fleet average for calendar year 2006. Road dust emissions were taken from *Control of Open Fugitive Dust Sources*, U.S EPA, 9/88.

POLLUTANT	EMISSION FACTOR (LB/VMT)	EMISSIONS (LB/YEAR)		
		I	II	III
Tractor-pulled trailers	VMT/year	30000	30000	60000
NOx	0.05928	1,778	1,778	3,557
POC	0.03992	1,198	1,198	2,395
SO2	0.00032	10	10	19
CO	0.424336	12,730	12,730	25,460
PM10 (combustion)	0.002288	69	69	137
PM10 (road dust)	0.227	6,810	6,810	13,620
PM10 (total)	0.229	6,879	6,879	13,757
Pickup trucks	VMT/year	10,000	10,000	10,000
NOx	0.00136	14	14	14
POC	0.0014	14	14	14
SO2	0.00001	0	0	0
CO	0.01447	145	145	145
PM10 (combustion)	0.00008	1	1	1
PM10 (road dust)	0.062	620	620	620
PM10 (total)	0.062	621	621	621

## Background

### Facility Emission Impacts May Be Underestimated

Calculations of criteria air contaminants, provided in the AFC and its appendices, for the facility appeared to be underestimated. Page 5.1-27 of the AFC states that the construction of each phase of the facility would last approximately 24 months, and that overlapping of construction of the three phases would occur. However, the air quality impact analysis, contained in the AFC, includes two distinct, separate phases of construction and operation as if they are not overlapping. Because of this, staff believes that the facility operational emission impacts may be underestimated.

### Data Request

9. Please provide a revised air quality impact analysis to identify the facility's impacts for two special cases:
  - a. when Ivanpah 1 is in operation (including emissions identified in Data Requests 1 and 2) and Ivanpah 2 is under construction; and

- b. Ivanpah 1 and 2 are operational (including emissions identified in Data Requests 1 and 2) and Ivanpah 3 is under construction.

**Response:** As stated in Applicant's December 28, 2007 letter, an additional 30 days has been requested to respond to this data request. Applicant intends to provide a response by February 11, 2008.

## Background

### NO<sub>2</sub> Impacts Modeling Analysis

The air quality modeling analysis uses the plume volume molar ratio method (PLMRM) adaptation of the ozone limiting method to assess the facility's NO<sub>2</sub> emission impacts (AFC, page 5.1-38). The data used in this analysis are collected from Barstow, which is 110 miles away from the facility. Absent from this analysis is a qualitative analysis to demonstrate that whether the use of Barstow ambient air quality data is appropriate for the project site. Without such analysis, staff cannot determine that the results of the submitted NO<sub>2</sub> impact analysis are accurate.

## Data Request

10. Please provide a qualitative analysis to demonstrate the appropriate use of ambient air quality data, collected at the Barstow monitoring station, for the project's NO<sub>2</sub> emission impacts.

**Response:** The qualitative analysis was included in the June 18, 2007 Modeling Protocol that was submitted to the Mojave Desert Air Quality Management District and to the CEC in June 2007. No comments have been received from either agency.

The relevant portion of the Modeling Protocol is reproduced below:

Ambient concentrations of ozone, NO<sub>2</sub>, and PM<sub>10</sub> are recorded at two monitoring stations—one located in Barstow, about 100 miles west-southwest of the project site; and the other located in Trona, 110 miles west-northwest of the project site. Trona PM<sub>10</sub> measurements may contain anomalies that are attributable to local sources or events in or near the Searles Valley. CO is also measured at Barstow. SO<sub>2</sub> is also measured in Trona. Ambient PM<sub>10</sub> concentrations are monitored at four closer locations in Pahrump, Nevada, 50 miles from the Ivanpah project site. The Pahrump Valley is experiencing local elevated PM levels due to intense development. The level of development that is causing problems in Pahrump is not present in the Ivanpah Valley. Therefore the data from the Pahrump stations are not useful as background data for the project.

The Barstow station is the closest California station to the Ivanpah SEGS site for which NO<sub>2</sub> data are available. The entire Mojave Desert is located downwind of Los Angeles, and is subject to pollutant transport. Desert locations that are closer to Los Angeles, such as Barstow, typically see much higher NO<sub>2</sub> concentrations than more remote stations. Of the two stations for which data were considered, Barstow had higher peak and average NO<sub>2</sub> concentrations.

The use of Barstow data is therefore likely to overstate the existing background concentrations in the vicinity of the project site.

## **Background**

### **Cumulative Impacts Analysis**

Section 5.1.7 of the AFC states that a cumulative impact analysis would be performed after all necessary data from the Mojave Desert Air Quality Management District are received. It is not clear whether construction and operational emissions from a photovoltaic facility being proposed to be built near the Ivanpah site would be considered in the analysis.

### **Data Request**

11. Please provide a specific date when the cumulative impact analysis would be performed and submitted.

**Response:** Based upon information provided by the District (see Attachment DR11-1) in response to Applicant's data request, there are no projects in the vicinity of the Ivanpah SEGS for which a cumulative impact analysis needs to be prepared.

12. Please include the construction and operational emissions from the proposed nearby photovoltaic facility in the cumulative impact analysis; or if they are not included discuss the rationale for exclusion.

**Response:** No information is publicly available from this project that would support a cumulative impact analysis. There is no information available concerning the scheduling or magnitude of construction emissions. Although there is no information available concerning operational emissions, photovoltaic facilities generally do not include sources that emit air pollutants (there might be one or more emergency standby engines).

Any estimate of emissions from this project would be speculative, and therefore beyond the scope of this CEQA analysis.



ATTACHMENT DR11-1

## **Letter from MDAQMD**

---



## **Mojave Desert Air Quality Management District**

14306 Park Avenue, Victorville, CA 92392-2310

760.245.1661 • fax 760.245.2699

Visit our web site: <http://www.mdaqmd.ca.gov>

Eldon Heaston, Executive Director

August 23, 2007

Mr. Steve Hill  
Sierra Research  
1801 J Street  
Sacramento, CA 95814

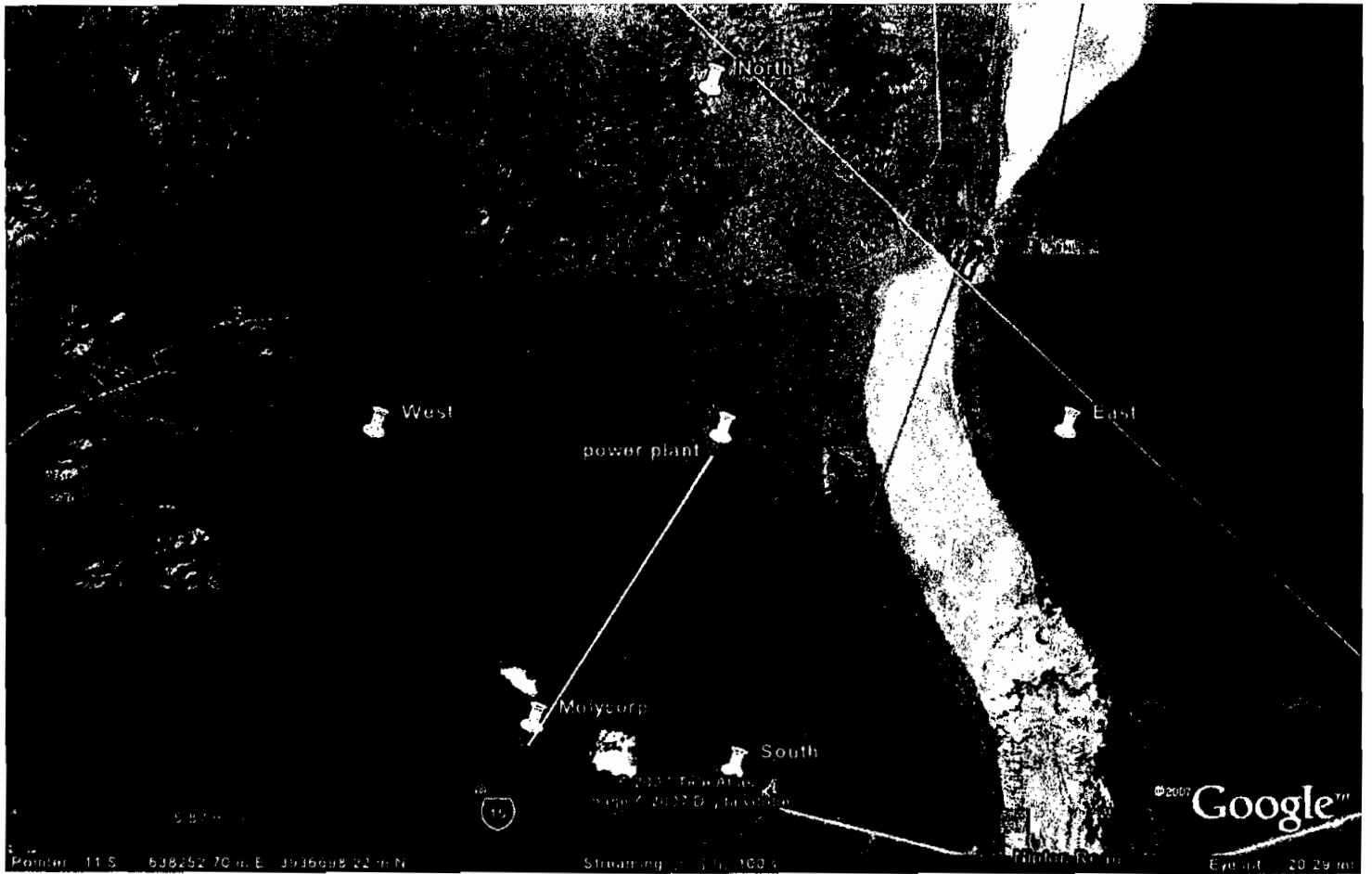
RE: BrightSource Energy, Inc.  
Ivanpah Solar Electric Generating Station

Dear Mr. Hill:

This is the Mojave Desert Air Quality Management District's (MDAQMD) response to your letter of August 20, 2007 regarding the proposed Ivanpah Solar Electric Generating Station. Based upon the enclosed aerial photograph there is one source within 6 miles and part of a second facility may be within 6 miles.

The only known emission source within 6 miles of this project is the small gasoline dispensing system at the Primm Valley Golf Club, see enclosed permit N005051. This permit was modified in to add new test requirements. The maximum allowed ROG/VOC emission based upon a maximum throughput of 500,000 gallons per year is 0.45 tpy.

Part of the Union Oil Molycorp facility located at 67750 Bailey Road maybe within six miles of this proposed power plant. The MDAQMD feels most, if not all, of the permitted operating equipment is beyond the 6 miles radius. Enclosed is a list of permitted equipment. On May 3, 2004 the 'Temporary Packaging System', permit B008794 was modified, see the enclosed Engineering Evaluation. Currently the MDAQMD is work on an application to modified the 'SX Tanks – Lanthanide Process', permit B001936 by adding additional ROG/VOC controls. This control will reduce the ROG/VOC potential to emit (PTE). Also enclosed is a summary of the 2004, 2005 and 2006 emissions. The MDAQMD did brief analyses on the PM10 emission and about 99.8 to 99.9% came from non-permitted activities. These analyses are enclosed. Because of many factors this facility has been operating an extremely low level for the last few years.



5. The owner or operator shall conduct and pass the following tests annually using the latest adopted version of the following test procedures:
  - a. Pressure Decay Tests per CARB test method TP-201.3B.
  - b. Liquid Removal Test (if applicable) per TP-201.6
  - c. Emergency vents and manways shall be leak free when tested at the operating pressure of the tank in accordance with CARB test methods, as specified in Title 17, California Code of Regulations.

The District shall be notified a minimum of 10 days prior to performing the required tests with the final results submitted to the District within 30 days of completion of the tests.

Passing test reports shall be received by the District not later than six (6) weeks prior to the expiration date of this permit.

6. The annual throughput of gasoline shall not exceed 500,000 gallons per year. Throughput Records shall be kept on site and available to District personnel upon request. Before this annual throughput can be increased the facility may be required to submit to the District a site specific Health Risk Assessment in accord with a District approved plan. In addition public notice and/or comment period may be required.
7. The o/o shall maintain and operate this equipment in compliance with CARB Executive Order G-70-116-F.

# Molycorp - Mountian Pass

B002831	PTO	Basic	PACKAGING SYSTEM FOR CERIUM CIRCUIT NO. 2
B002832	PTO	Basic	PACKAGING MACHINE FOR No. 1 LANTHANUM DRYER SYSTEM
B003259	PTO	Basic	DRYER - CHEMICAL PLANT RIBBON BLENDER
B003265	PTO	Basic	FLAKE LANTHANUM PROCESS
B003995	PTO	Basic	CALCINER SERVING THE NEODYMIUM OXIDE PROCESS WITH 300 LB/H AND 600 LB/H AVERAGE AND MAXIMUM THROUGHPUTS AT 1800 DEGREES F ON NEODYMIUM CARBONATE, FIRED WITH PROPANE.
B004027	PTO	Basic	FURNACE #3: YTTRIUM/EUROPIUM CO-PRECIP
B004028	PTO	Basic	PACKAGING - YTTRIUM PROCESS
B004030	PTO	Basic	PACKAGING - YTTRIUM, CO-PRECIPITATION
B004033	PTO	Basic	CERIUM SLURRY MAKE-UP PROCESS
B004035	INACT	Basic	LEAD CINDER/FLY ASH STABILIZATION PROCESS
B004087	PTO	Basic	NEO CARB/NEO CARB FLUORIDE CIRCUIT
B004088	INACT	Basic	CERIUM 90 LEACH CIRCUIT
B004090	PTO	Basic	No. 2 SODA ASH FEED PROCESS
B004093	INACT	Basic	WASTEWATER TREATMENT SYSTEM
B004100	PTO	Basic	LEACH RESIDUE (CE-96 PLANT) CIRCUIT
B004325	INACT	Basic	AQUA AMMONIA (15%) SYSTEM
B004333	PTO	Basic	YTTRIUM PRECIPITATION - SPECIALTY PLANT
B004371	PTO	Basic	PURIFICATION PROCESS - EUROPIUM
B004489	PTO	Basic	STABILIZED LEAD/IRON REINTRODUCTION PROCESS
B004664	PTO	Basic	RIBBON BLENDER DRYER
B004921	PTO	Basic	CERIUM REDOX CIRCUIT
B004923	PTO	Basic	SPECIALTY PLANT No. 1 NEODYMIUM DRYER
B004924	PTO	Basic	SPECIALTY PLANT No. 2 NEODYMIUM DRYER
B004933	PTO	Basic	LEACH CIRCUIT - FLOATATION PLANT
B007791	INACT	Basic	PORTABLE IMPACT CRUSHER
B007792	ATC	Basic	DIESEL ENGINE DRIVEN GENERATOR
B007792	MOD	Emergency I C E	DIESEL IC ENGINE, EMERGENCY GENERATOR
B008263	PTO	Basic	FLOTATION REAGENT HANDLING SYSTEM
B008294	INACT	Basic	Temporary Rare Earth Packaging System
B008344	INACT	Basic	ALTERNATE TEMPORARY RARE EARTH PACKAGING SYSTEM
B008348	INACT	Basic	TEMPORARY LANTHANUM PACKAGING SYSTEM
B008794	ATC	Basic	TEMPORARY PACKAGING SYSTEM
C000324	PTO	Air Pollution Control Device	SCRUBBER - HCL
C000325	PTO	Air Pollution Control Device	SCRUBBER - HCL
C000376	PTO	Air Pollution Control Device	BAGHOUSE (No. 1 CONCENTRATE DRYER FEED)
C000378	PTO	Air Pollution Control Device	BAGHOUSE - No. 2 CERIUM CIRCUIT DRYER SYSTEM
C000380	PTO	Air Pollution Control Device	BAGHOUSE - No. 2 CERIUM CIRCUIT PACKAGING SYSTEM

# Molycorp - Mountian Pass

C004343	PTO	Air Pollution Control Device	BAGHOUSE (No. 1 CONCENTRATE DRYER PACKAGING)
C004415	PTO	Air Pollution Control Device	BIN VENT - No. 2 CERIUM PACKAGING SYSTEM (SOUTH BIN)
C004416	PTO	Air Pollution Control Device	BAGHOUSE - No. 2 CERIUM PACKAGING SYSTEM
C004490	PTO	Air Pollution Control Device	BAGHOUSE - STABILIZED Pb/Fe REINTRODUCTION PROCESS
C004615	PTO	Air Pollution Control Device	BIN VENT - CEMENT SILO
C004666	PTO	Air Pollution Control Device	SCRUBBER - CAUSTIC (LEAD REMOVAL CIRCUIT)
C004710	PTO	Air Pollution Control Device	BIN VENT - PURIFICATION PROCESS
C004711	PTO	Air Pollution Control Device	CAUSTIC SCRUBBER- PURIFICATION PROCESS
C004922	ATC	Air Pollution Control Device	SCRUBBER - CAUSTIC (CERIUM REDOX CIRCUIT)
C004925	PTO	Air Pollution Control Device	BAGHOUSE - No.1 NEODYMIUM DRYER
C004926	PTO	Air Pollution Control Device	BAGHOUSE - No.2 NEODYMIUM DRYER
C004930	PTO	Air Pollution Control Device	WATER SCRUBBER
C004939	INACT	Air Pollution Control Device	BAGHOUSE - No.2 CONCENTRATE DRYER
C004941	PTO	Air Pollution Control Device	BIN VENT - PORTABLE SILO (CHEMICAL PLANT)
C005098	PTO	Air Pollution Control Device	SCRUBBER No. 1- LEACH CIRCUIT (FLOATATION PLANT)
C008264	ATC	Air Pollution Control Device	BAGHOUSE (FLOTATION REAGENT HANDLING)
C008295	INACT	Air Pollution Control Device	Temporary Rare Earth Packaging System Particulate Controls
N004629	PTO	Gasoline Service Station - Non-Retail	GASOLINE DISPENSING FACILITY (NON-RETAIL)
T000374	PTO	Tanks (or Silos)	CEMENT SILO
T000824	PTO	Tanks (or Silos)	No. 2 CRUSHED ORE STORAGE BIN
T000834	PTO	Tanks (or Silos)	STORAGE TANKS - HYDROCHLORIC ACID
T000835	PTO	Tanks (or Silos)	STORAGE TANK - HCL FOR MILL
T001942	INACT	Tanks (or Silos)	BASTNASITE LEACH TANK SYSTEM
T001943	PTO	Tanks (or Silos)	SOLVENT STORAGE - SPECIALTY PLANT
T001948	PTO	Tanks (or Silos)	KEROSENE STORAGE - SEPARATIONS PLANT STORAGE
T002826	PTO	Tanks (or Silos)	SODA ASH STORAGE TANK
T002830	PTO	Tanks (or Silos)	STORAGE TANK- FEED TO ROD MILL No 1
T003117	PTO	Tanks (or Silos)	TANK - WASTE OIL
T004092	PTO	Tanks (or Silos)	TANK FARM - FEED STORAGE
T004095	PTO	Tanks (or Silos)	CONCENTRATE STORAGE BIN
T004096	PTO	Tanks (or Silos)	CONCENTRATE STORAGE BIN
T004548	PTO	Tanks (or Silos)	PORTABLE SILO
T004939	PTO	Tanks (or Silos)	HOPPER

1. This equipment shall be used to package rare earth concentrate derived from ponds P-25B and P-7A only, without the prior written permission of the District.
2. This equipment shall be used to package no more than 4,000,000 pounds of material.
3. The owner/operator (o/o) shall maintain a monthly log of the amount of material packaged with this equipment, in pounds or tons (on a per-month and cumulative basis). This log shall be maintained current and on-site for the duration of the packaging operation, and shall be provided to District, State or Federal personnel upon request.
4. Sufficient moisture shall be present or added to the material packaged to ensure compliance with Rules 401, 402 and 403 during all packaging-related handling and packaging operations.
5. This equipment and the equipment covered by permit B004489 (the Reintroduction Process) shall not jointly emit more than 168 pounds of PM10 per year. Non-operation of this system during a calendar year in which the Reintroduction Process is operated shall be sufficient to demonstrate compliance with this condition; alternatively, the owner/operator shall demonstrate compliance with a District-approved method.

**COMMENTS:**

**PERMIT FEES/RATING:**

<u>Fee Schedule</u>	<u>Rating</u>	<u>Permit</u>
7(I)	1	B008794

Particulate Matter 2.5 Microns or Less	8.500E-03
p-Dichlorobenzene	7.718
Propylene	8.383E-03
Radionuclides	2.061
Selenium	4232.484
Silica, crystalline	0.136
Silver	11.690
Toluene	0.265
Total Organic Gas	7.210
Xylenes (mixed)	78.243
Zinc	



HOTSPOTS ANALYSIS AND REPORTING SYSTEM  
FACILITY SUMMARY - ALL REPORTED SUBSTANCES

08/22/07

Year 2006

User-specified list of facilities

(NOTE 1: emissions in LBS/YR for toxics, TONS/YR for criteria pollutants, CURRIES/YR for radionuclides)

FACILITY NAME	FSIC	ADDRESS	CITY	ZIP	POLLUTANT	EMITTER ID	EMISSIONS (NOTE 1)
500364	1099	MOLYCORP, INC. 67750 BAILEY ROAD MOUNTAIN PASS		92366	Ammonia	7664417	1.700E-03
					Carbon Monoxide	42101	14.800
					Lead	7439921	0.145
					Oxides of Nitrogen	42603	45.784
					Oxides of sulfur	42401	5.672
					Particulate Matter	11101	534.544
					Particulate Matter 10 Microns or Less (PM10)	85101	262.914
					Particulate Matter 2.5 Microns or Less	88101	103.467
					Reactive Organic Gas	16113	0.248
					Total Organic Gas	43101	4.592

# MOLYCORP

## 2005 CEIR

FACID	DEV	PERID	PROID	PRODESC	POL	POLN	PR	EMFAC	EMS	HRMAXEMS
500364	385	B000385	1	LANTHANUM NO. 2 PRODUCT DRYER	85101	Particulate Matter 10 Microns or Less (PM10)			0.14	
500364	899	B000899	1	NO. 1 FURNACE/PRODUCT BAGHOUSE (ELECTRIC)	85101	Particulate Matter 10 Microns or Less (PM10)			0.0002	
500364	819	B000819	1	FLOT PLANT NO. 1 PRODUCT DRYER BAGHOUSE	85101	Particulate Matter 10 Microns or Less (PM10)			0.0014	
500364	792	B000792	1	DIESEL ENGINE GENERATOR	85101	Particulate Matter 10 Microns or Less (PM10)			0.072	
500364	8794	B0008794	1	PACKAGING OF MATERIAL FROM POND 25-B (TRACKHOE)	85101	Particulate Matter 10 Microns or Less (PM10)			0.017	
500364	8794	B0008794	2	PACKAGING OF MATERIAL FROM POND 25-B (MATERIAL HANDLING)	85101	Particulate Matter 10 Microns or Less (PM10)		Permitted	0.000037	
									0.230637	
500364	90005			1 WEST OVERBURDEN STOCKPILE	85101	Particulate Matter 10 Microns or Less (PM10)				10
500364	90006			1 NORTH OVERBURDEN STOCKPILE	85101	Particulate Matter 10 Microns or Less (PM10)				8.5
500364	90007			1 SOUTH OVERBURDEN STOCKPILE #1	85101	Particulate Matter 10 Microns or Less (PM10)				5.7
500364	90008			1 SOUTH OVERBURDEN STOCKPILE #2	85101	Particulate Matter 10 Microns or Less (PM10)				2.6
500364	90009			1 SOUTH OVERBURDEN STOCKPILE #3	85101	Particulate Matter 10 Microns or Less (PM10)				1
500364	90010			1 CRUSHED ORE STORAGE PADS	85101	Particulate Matter 10 Microns or Less (PM10)				1.1
500364	90011			1 WEST LEACHED CONCENTRATE STORAGE PAD	85101	Particulate Matter 10 Microns or Less (PM10)				0.052
500364	90012			1 WEST UNLEACHED CONCENTRATE STORAGE PAD	85101	Particulate Matter 10 Microns or Less (PM10)				0.026
500364	90013			1 WEST TAILINGS STORAGE POND (P-1, PART 1)	85101	Particulate Matter 10 Microns or Less (PM10)				1.8
500364	90014			1 WEST TAILINGS STORAGE POND (P-1, PART 2)	85101	Particulate Matter 10 Microns or Less (PM10)				6.8
500364	90015			1 PRODUCT STORAGE POND (P-7A)	85101	Particulate Matter 10 Microns or Less (PM10)				0.96
500364	90016			1 PRODUCT STORAGE POND (P-7B)	85101	Particulate Matter 10 Microns or Less (PM10)				0.58
500364	90017			1 TAILINGS POND (P-16)	85101	Particulate Matter 10 Microns or Less (PM10)				8.1
500364	90018			1 WINDBLOWN TAILINGS PILES (P-17A)	85101	Particulate Matter 10 Microns or Less (PM10)				3.2
500364	90019			1 WINDBLOWN TAILINGS PILES (P-17B)	85101	Particulate Matter 10 Microns or Less (PM10)				16
500364	90020			1 SEEPAGE COLLECTION POND (P-23A)	85101	Particulate Matter 10 Microns or Less (PM10)				0.061
500364	90021			1 OPEN MINE PIT EROSION	85101	Particulate Matter 10 Microns or Less (PM10)				60
500364	90022			1 FROSTY'S POND	85101	Particulate Matter 10 Microns or Less (PM10)				1.4
500364	90023			2 GASOLINE OPERATED VEHICLES - DUST (FORK LIFTS)	85101	Particulate Matter 10 Microns or Less (PM10)				0.33
500364	90023			3 GASOLINE VEHICLES - EXHAUST (VARIOUS PICK-UP TRUCKS & VANS)	85101	Particulate Matter 10 Microns or Less (PM10)				0.0039
500364	90023			4 GASOLINE OPERATED VEHICLES - EXHAUST (FORK LIFTS)	85101	Particulate Matter 10 Microns or Less (PM10)				0.0013
500364	90023			1 GASOLINE VEHICLES - DUST (VARIOUS PICK-UP TRUCKS & VANS)	85101	Particulate Matter 10 Microns or Less (PM10)				2
500364	90024			2 DIESEL OPERATED VEHICLES - DUST (GRADERS)	85101	Particulate Matter 10 Microns or Less (PM10)				0.0028
500364	90024			4 DIESEL OPERATED VEHICLES - DUST (BACKHOES)	85101	Particulate Matter 10 Microns or Less (PM10)				0.18
500364	90024			5 DIESEL OPERATED VEHICLES - DUST (LOADERS)	85101	Particulate Matter 10 Microns or Less (PM10)				0.1
500364	90024			6 DIESEL OPERATED VEHICLES - EXHAUST (WATER SPRAY TRUCKS)	85101	Particulate Matter 10 Microns or Less (PM10)				0.13
500364	90024			7 DIESEL OPERATED VEHICLES - EXHAUST (GRADERS)	85101	Particulate Matter 10 Microns or Less (PM10)				0.007
500364	90024			8 DIESEL OPERATED VEHICLES - EXHAUST (BULLDOZERS)	85101	Particulate Matter 10 Microns or Less (PM10)				0.0014
500364	90024			9 DIESEL OPERATED VEHICLES - EXHAUST (BACKHOES)	85101	Particulate Matter 10 Microns or Less (PM10)				0.0023
500364	90024			10 DIESEL OPERATED VEHICLES - EXHAUST (LOADERS)	85101	Particulate Matter 10 Microns or Less (PM10)				0.0038
500364	90024			3 DIESEL OPERATED VEHICLES - DUST (BULLDOZERS)	85101	Particulate Matter 10 Microns or Less (PM10)				0.02
500364	90025			1 DIESEL OPERATED VEHICLES - DUST (WATER SPRAY TRUCKS)	85101	Particulate Matter 10 Microns or Less (PM10)				0.0014
500364	90025			1 LEACH THICKENER OVERFLOW POND (P-4)	85101	Particulate Matter 10 Microns or Less (PM10)				0.0056
500364	90026			1 PRODUCT STORAGE POND (P-25A)	85101	Particulate Matter 10 Microns or Less (PM10)				2
500364	90027			1 OLD LEAD STORAGE POND (P-4)	85101	Particulate Matter 10 Microns or Less (PM10)				0.13
500364	90028			1 OLD LEAD STORAGE POND (P-24)	85101	Particulate Matter 10 Microns or Less (PM10)				0.0049
500364	90029			1 NEW LEAD STORAGE POND (P-11A)	85101	Particulate Matter 10 Microns or Less (PM10)				0.015
500364	90030			1 NEW LEAD STORAGE POND (P-11B)	85101	Particulate Matter 10 Microns or Less (PM10)				0.093
500364	90031			1 REAGENT SPILLAGE POND (P-15)	85101	Particulate Matter 10 Microns or Less (PM10)				0.0018
500364	90032			1 NEW IVANPAH EVAPORATION POND	85101	Particulate Matter 10 Microns or Less (PM10)				97
500364	90033			1 DOMESTIC SEWAGE POND (P-19B)	85101	Particulate Matter 10 Microns or Less (PM10)				0.11
500364	90034			1 STORMWATER RETENTION POND (P-20A)	85101	Particulate Matter 10 Microns or Less (PM10)				0.13
500364	90035			1 BARRIER TO P-19 (P-20D)	85101	Particulate Matter 10 Microns or Less (PM10)				0.07
500364	90037			1 POND P-25B	85101	Particulate Matter 10 Microns or Less (PM10)				0.16
500364	90041			1 RENTAL DIESEL GENERATOR	85101	Particulate Matter 10 Microns or Less (PM10)				0.19
500364	90042			1 MATERIAL SCREENING	85101	Particulate Matter 10 Microns or Less (PM10)				1.5
500364	90043			1 BULLDOZING/SCRAPING/GRADING	85101	Particulate Matter 10 Microns or Less (PM10)				22
500364	90044			1 MATERIAL HANDLING	85101	Particulate Matter 10 Microns or Less (PM10)				14
500364	90045			1 GASOLINE VEHICLES - EXHAUST (CONSTRUCTION VEHICLES)	85101	Particulate Matter 10 Microns or Less (PM10)				5.1
500364	90045			2 GASOLINE VEHICLES - FUGITIVE DUST (CONSTRUCTION VEHICLES)	85101	Particulate Matter 10 Microns or Less (PM10)				0.0099
500364	90046			1 DIESEL VEHICLES - EXHAUST (CONSTRUCTION VEHICLES)	85101	Particulate Matter 10 Microns or Less (PM10)				12
500364	90046			2 DIESEL VEHICLES - FUGITIVE DUST (CONSTRUCTION VEHICLES)	85101	Particulate Matter 10 Microns or Less (PM10)				8.3
500364	91005			1 PROPANE HEATING UNITS	85101	Particulate Matter 10 Microns or Less (PM10)		Fugitive	283.1891	0.068
								TOTAL	293.4197	
								%	99.92%	

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**sierra  
research**

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August 20, 2007

Mojave Desert Air Quality Management District  
Attn: Richard Wales  
14306 Park Avenue  
Victorville, CA 92392-2310

Subject: Cumulative Impacts Analysis  
Ivanpah Solar Electric Generating Station

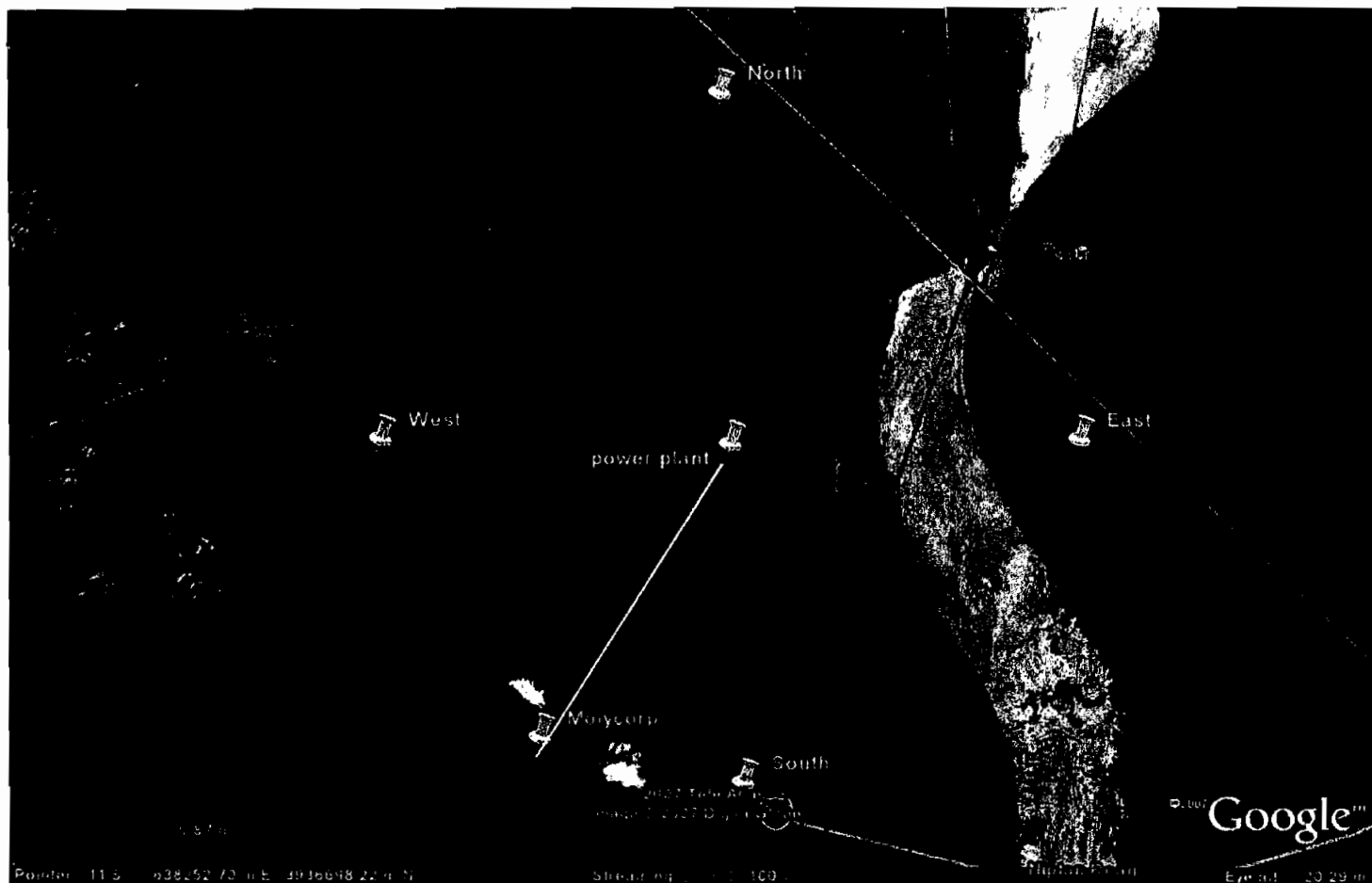
Dear Mr. Wales:

BrightSource Energy, Inc (BrightSource) intends to submit an Application for Certification to the California Energy Commission and an Application for a Determination of Compliance (equivalent to Authority to Construct permit) to the Mojave Desert Air Quality Management District for the proposed Ivanpah Solar Electric Generating Station (Ivanpah SEGS) in Summer 2007. A map showing the project site, which was included in the modeling protocol previously submitted for your review, is attached for your information.

As part of the project review, the CEC requires the applicant to prepare an analysis of the project's cumulative impacts. This is defined by the CEC as "a cumulative air quality modeling impacts analysis of the project's typical operating mode in combination with other stationary source emissions sources within a six-mile radius *which have received construction permits but are not yet operating, or are in the permitting process.*" (Emphasis added.) The CEC staff considers facilities having an emission increase for each criteria pollutant of less than five tons per year to be *de minimis*, so such facilities may be excluded from the analysis.

Therefore, in order to prepare the required cumulative impacts analysis, we request that the District provide the following information:

- A list of all Authorities to Construct issued since July 1, 2004 to facilities within a 6-mile radius of the proposed Ivanpah SEGS site;
- A list of all current applications for Authority to Construct under review by the District for facilities within a 6-mile radius of the proposed Ivanpah SEGS site;
- Exclude all facilities with maximum potential emissions below 5 tons per year per each criteria pollutant; and
- Include criteria pollutant emission rates and stack parameters for all equipment associated with the Authorities to Construct identified above so that we can include these sources in our air quality modeling.



# Biological Resources (13 – 32)

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## Background

There are significant populations of Sahara mustard, schismus, and cheatgrass in the project region. One of the BLM's primary responsibilities is to curtail the spread of invasive species for a number of reasons. For example, invasive species increase fire risk, reduce natural habitat for native plants and wildlife, and compete with native plants for water and other resources. On AFC page 5.2-60, section 5.2.11.2 Mitigation Measure 2 - Noxious Weeds states that a Noxious Weed Control Plan will be prepared and submitted to BLM prior to construction. However, BLM needs to review a draft Weed Management Plan sooner to facilitate completion of the final plan according to the template BLM provided to the applicant. Similarly, information on the soil source(s) for foundations and structural support is needed because soils brought in from another location will have to be tested for invasive species seeds and other contents.

## Data Request

13. Please prepare and submit a Weed Management Plan to the Energy Commission and BLM that includes herbicides to be used in control methods.

**Response:** As stated in Applicant's December 28, 2007 letter, additional time has been requested to respond to this data request. A meeting with the BLM (and other interested agencies) will be scheduled in January 2008 to discuss specifics of the Weed Management Plan and develop a timeline for the submittal of a conceptual draft and a final Weed Management Plan. A copy of the draft Weed Management Plan will be provided as soon as it is available.

14. Describe specific methods for weed management under heliostat structures (e.g., pre-emergent herbicide or other methods).

**Response:** The Weed Control Management Plan prepared in response to Data Request 13 will include information on weed control under the heliostat structures.

15. Provide details on the origin of soil sources, including discussion of whether soil will be obtained from within the project footprint and/or transported in from another location.

**Response:** The site will be graded such that all borrow and fill sites will be located within the project site. In other words, no soil will be transported in from another location or exported offsite.

## Background

AFC Table 5.2-15 provides an overview of permits required for biological resources and indicates that the process for each requires approximately six to nine months.

The AFC also refers to informal consultation with staff members at agencies regarding the project and potential biological issues of concern. However, staff could not find any documentation on the dates, personnel, and content of communications with the California Department of Fish and Game (CDFG), U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), or U.S. Fish and Wildlife Service (USFWS) regarding sensitive biological resources, such as the federally threatened desert tortoise, jurisdictional waters, and permitting requirements. In addition, a USFWS-approved Biological Assessment (BA) with agreed upon mitigation needs to be provided so the Preliminary and Final Staff Assessments can be completed.

### Data Request

16. Please provide any documents (i.e., letters or records of conversation including dates and names of agency personnel) that resulted from communication with CDFG, RWQCB, USACE, and USFWS staff regarding sensitive biological resources and jurisdictional waters.

**Response:** The records of conversation by CH2M HILL staff about discussions with CDFG, USACE, and USFWS during the preparation of the AFC are provided in Attachment DR16-1. No conversations were conducted by the biologists with the RWQCB.

17. Provide status and progress updates on the anticipated schedule (including estimated dates) for submitting the BA and consulting with CDFG regarding rare plant and desert tortoise impacts.

**Response:** A draft Biological Assessment was prepared by CH2M HILL and submitted to the BLM on October 30, 2007. The BA will be submitted to the USFWS by the BLM upon the completion of their review of the document. Meetings with CDFG will be scheduled within 60 days of submittal.

18. Clarify the status and anticipated schedule (including estimated dates) of USACE, RWQCB, and CDFG permitting for (and verification of) project activity affecting jurisdictional waters. This response may be prepared in conjunction with the responses to related Soils and Water Resources data requests.

**Response:** A wetland delineation report will be submitted to the USACE no later than March 12, 2008. A field verification meeting with the USACE will be requested as part of the wetland delineation submittal. The anticipated permitting schedule will be discussed with the USACE. Once the wetland delineation is complete, the Applicant will enter into discussions with CDFG and RWQCB. As stated in Applicant's December 28, 2007 letter, an additional 60 days has been requested to respond to this data request.

19. For jurisdictional waters, please provide expected impact acreages as well as mitigation ratios and acreages for the Clean Water Act section 401 and 404 permits and CDFG Streambed Alteration Agreement, as appropriate.

**Response:** A wetland delineation report will be submitted to the USACE no later than March 12, 2008. A field verification meeting with the USACE will be requested as part of the wetland delineation submittal. The anticipated mitigation ratios and acreages will be discussed with the USACE. Once the results of the wetland delineation are determined complete by the USACE, discussions regarding mitigation and permitting with CDFG and RWQCB will be scheduled. As stated in Applicant's December 28, 2007 letter, additional time has been requested to respond to this data request.

20. Provide copies of the draft and final USFWS-approved BA, including required habitat compensation ratios and acreages, to Energy Commission and BLM staff.

**Response:** Once the BA is submitted to USFWS, copies of the draft BA will be provided to CEC staff. Once the BA has been approved by the USFWS, copies of the Final BA and Biological Opinion will be provided to CEC staff. As stated in Applicant's December 28, 2007 letter, additional time has been requested to respond to this data request.

## Background

Certain common California desert plants protected under the California Desert Native Plants Act and San Bernardino County Development Code (title 8, division 9, chapter 4, section 89.0420) require a permit from the Agricultural Commissioner or other applicable County Reviewing Authority prior to removal or harvesting. In the project area these include cacti, Mojave yucca, and any creosote bush rings ("creosote rings") above a 10-foot diameter. Although creosote bush grows throughout the project area, the applicant did not state whether any creosote rings were searched for or documented.

## Data Request

21. Please state the number of creosote rings found in the project area. If any are present, please provide mapped locations and size estimates.

**Response:** During consultation with the agencies prior to the start (and after completion) of the fieldwork, the presence or absence of creosote rings was not mentioned. Hence, our field crews did not look for, nor did they identify any creosote rings. However, as discussed at the January 4<sup>th</sup> workshop, the Applicant will review its aerial photos to determine if such rings are discernable and provide the results of that review to the CEC and BLM.

22. Provide a description of the proposed project's conformance with the California Desert Native Plants Act and the San Bernardino County Development Code, expected impacts, and specific mitigation.

**Response:** Details on expected impacts and mitigation will be provided after preconstruction surveys for annual plants have been conducted and coordination with the resource agencies regarding mitigation has been completed. As stated in Applicant's December 28, 2007 letter, an additional 60 days has been requested to

respond to this data request. A description of the project's conformance with the CNDP Act and the County Development Code will be provided no later than March 12, 2008.

## Background

According to AFC section 5.2.9.2.4, approximately 34 percent of the estimated known acreage of creosote bush-white bursage-barrel cactus vegetation in California could be impacted by the project. This vegetation type is noted as worthy of consideration in the list of terrestrial natural communities developed for CDFG's California Natural Diversity Database, and BLM has expressed concerns regarding its loss and the availability of habitat compensation lands. The impact discussion noted a lack of information regarding its abundance and did not conclude whether impacts would be considered significant or require additional mitigation.

## Data Request

23. Please provide additional discussion on direct, indirect, and cumulative impacts to creosote bush-white bursage-barrel cactus vegetation.
  - a. Address the significance of these impacts as determined through discussions with BLM, CDFG, and USFWS biology staff.
  - b. Discuss the mitigation suggested by the above agencies to mitigate impacts.

**Response:** None of the three individual species (creosote, bush-white and bursage-barrel cactus) are special status species nor are these three common species in this combination habitat for any special status species. In addition, Counsel for the Applicant is unaware of any legal authority that provides that project applicants must mitigate for potential impacts on non-special status, common species based on their co-location or densities. Nevertheless, as stated in Applicant's December 28, 2007 letter, additional time has been requested to respond to this data request. Coordination meetings to discuss the creosote bush-white bursage-barrel cactus plant community type will be scheduled in January 2008. Additional information on the impacts to this natural vegetation type will be provided following the outcome of these discussions.

## Background

The AFC lacks a detailed project description for the following elements as they relate to biological resources: site runoff, pre-construction ground disturbance, and post-construction operations and maintenance activities. More information is needed for staff to determine whether these elements could result in additional impacts to biological resources. In addition, BLM needs this information for its consultation with USFWS on the effects of the proposed action on desert tortoise. BLM expressed concern regarding the formal consultation process with USFWS because other agencies may recommend project footprint changes, and it may be necessary to re-initiate the consultation process and biological evaluation.



## Data Request

- 24.a. Please provide a detailed description and analyze the associated biological resource impacts related to site runoff from rainfall and mirror washing.

**Response:** As stated in Applicant's December 28, 2007 letter, additional time has been requested to respond to this data request. These potential impacts will be discussed with the USACE and RWQCB during jurisdictional waters discussions and the field verification. See Data Response 18.

- 24.b. Down slope of the project, address the biological resource impacts and ground disturbance anticipated outside the 3,400-acre project site.

**Response:** As stated in Applicant's December 28, 2007 letter, additional time has been requested to respond to this data request. These potential impacts will be discussed with the USACE and RWQCB during jurisdictional waters discussions and the field verification. See Data Response 18.

25. Provide a detailed description and analyze the associated biological resource impacts related to ground disturbance within the heliostat array fields (AFC page 5.2-2).

**Response:** Additional details are presented in AFC Section 5.2.9.2, Impacts of Project Construction, Operation, and Maintenance (page 5.2-41). Although clearing and grubbing is to be performed only between every other row of the heliostat arrays, for the purposes of environmental review, the Applicant has assumed a "worst case" impact. Specifically, it is assumed that other ground disturbing activities (e.g., construction and use of access roads, installation and maintenance of transmission poles, construction and use of the substation and administration buildings, initial and ongoing vegetation removal and site maintenance) will occur within the entire site, although this worst case scenario will not be realized on the ground. Using this worst case assumption, the AFC assumes that all vegetation within the 3,400-acre site (or about 5.3 square miles) will be removed, displaced, or disturbed through construction and on-going long term activities. Coordination with the resource agencies will be conducted regarding the significance of this impact and appropriate mitigation.

26. Provide a graphic and description of areas of the site that will be graded and areas where root systems will be left in place, and indicate other areas of ground disturbance.

**Response:** See Data Response 25. Further, as stated in Applicant's December 28, 2007 letter, an additional 30 days has been requested to respond to this data request. Applicant intends to provide a response by February 11, 2008.

27. Provide a detailed description and analyze the associated biological resource impacts related to concrete drying beds (AFC section 2.2.7.4.4 Drying Beds).

a. Please describe the nature of the water to be evaporated.

**Response:** The term “concrete drying beds” was used in the AFC but is not accurate nomenclature for the intended use of these facilities. Applicant apologizes for the confusion this term might have caused. A more accurate term for these facilities is “concrete holding basins.” Their intended use is described as follows:

During plant construction, water from both hydrostatic testing and from boiler and piping passivation will be discharged to the concrete holding basins. Water will be demineralized well water without the addition of any chemicals. Hydrostatic testing and boiler and piping passivation will be a one-time use of approximately 300,000 gallons of water (100,000 gallons from power block piping and equipment, 170,000 gallons from the main piping outside the power block, and 30,000 gallons from the solar boiler receivers). Sock filters may also be used during discharge into the concrete holding basins to contain any large particles. The water will be laboratory tested for any toxins or harmful substances including: pH, TDS, iron, copper, and any other metals associated with the respective piping. Although some trace amounts metals are expected, the water should still be of good demineralized quality and be reusable for other purposes during construction, such as further hydrostatic testing or dust suppression. In the event that the water does not meet RWQCB standards for discharge or reuse, it will be vacuum-trucked offsite to the nearest disposal facility. If laboratory testing confirms that the water is suitable for discharge, or reuse consistent with all applicable standards, it will be used accordingly. In contrast, any chemical cleaning waste and discharge from boiler passivation will be collected separately and disposed of by the chemical cleaning contractor.

During normal plant operation the concrete holding basins will generally remain empty and available for the following intermittent and emergency uses. The basins will be used to store equipment wash down water, and in the event of any major equipment malfunction, they may also serve as a holding place for water until repairs can be made. If water is allowed to remain in the concrete holding basins for evaporation, the basins will be subject to the controls described in subparts c and d, below.

Because of the plant’s location in the arid Ivanpah basin in San Bernardino County, only very small amounts of any stormwater would fall into the concrete holding basins. The average annual rainfall is only 8.31 inches per year.

b. Quantify the concentrations of minerals that would result.

**Response:** As described in Data Response 27.a., above, any water discharged to the concrete holding basins could come from a variety of sources including: water from hydrostatic testing, water from boiler and piping passivation, equipment wash water, and in the event of any major equipment malfunction, the basins may also serve as a holding place for water until repairs can be made. Water from hydrostatic testing and boiler and piping passivation will be a one-time source of water to the drying beds. While the quality of this water and the concentrations of minerals in it

cannot be determined at this time (as is typical at this stage in the proposed project), this water would be tested for toxins and harmful substances.

- c. Discuss whether the concentrations would be toxic to wildlife, and if so, how the applicant will prevent use by birds and other wildlife.

**Response:** Any water discharged into the concrete holding basins will be covered to prevent wildlife access and tested to determine toxicity. If the water is potentially harmful to wildlife, it will be removed by vacuum truck and properly disposed of by a licensed contractor in accordance with existing law. If not potentially harmful to wildlife, it will be shielded from wildlife access through screening, netting, or other appropriate controls until discharge or reuse.

- d. Discuss the species, if any, which would be attracted to drying beds, and whether they would they be impacted.

**Response:** Water is a valuable resource in the Mojave Desert for plants and wildlife and sustained surface water is extremely rare. Therefore, creation of open basins or drying beds to collect process water could potentially be an attractant to wildlife species. The concrete holding basins will be located within the fenced site and, therefore, larger animals such as desert tortoise, desert kit fox, coyote, burros, and desert big horn sheep will be excluded from this water source. Other animals such as invertebrates, snakes, lizards and birds would not be excluded by the site perimeter fence. The Applicant will work with the BLM, CDFG, and USFWS for an approved design that will incorporate a feature such as caging or netting that will be installed around and over the beds specifically to exclude ravens.

- e. Address whether drying beds are synonymous with "evaporation pits" labeled in AFC figure 2.2-1b. If not, please provide descriptions and biological resource impact assessments for each.

**Response:** The "evaporation pits" shown in AFC Figure 2.2-1b are identical to the "drying beds" mentioned in AFC Section 2.2.7.4.4 "Drying Beds." As noted above, the term "concrete holding basins" should be used hereafter.

- 28. Please provide a detailed description and analyze the associated biological resource impacts related to ground disturbance from post-construction operations and maintenance activities including those at the following locations:

- a. facility perimeter fences

**Response:** The three site boundaries will be enclosed with chain-link fencing for security purposes and desert tortoise exclusionary fencing will be attached to the bottom of the chain link fencing. Vegetation inside the fence will be removed within 10 to 20 feet of the fenced areas. These areas will be maintained free of vegetation for interior access and security reasons.

The perimeter fences will be a barrier to desert tortoise and other wildlife that would otherwise move through the area. Tortoise and other wildlife attempting to travel

into or through the site may travel or linger along the fence line where they could be more vulnerable to predation or exposure.

b. roadways between the three proposed phases

**Response:** Roadways outside the three phases will exist between Ivanpah 1 and 2 that connect those sites to the common administration and warehouse facilities. All project roadways outside the phased sites will be fenced on each side of the corridor. The bottom 20 to 24 inches of the exclusionary fencing will be constructed of 1- to 2-inch galvanized vertical mesh fence material. The fence will be buried between 6 to 12 inches below ground or bent at a right angle towards the outside of the fence and covered with dirt, rocks or gravel to prevent the tortoise from digging under the fence. These fences will be maintained during the life of the project. The road exclusion fence will also be designed to direct tortoises towards under crossings that will be installed to maintain connectivity of habitat. The Applicant plans to work with the BLM, USFWS, and CDFG on an approved fence and road under crossing design.

c. the new segment of gas pipeline

**Response:** The section of gas line north of and outside the fenced site perimeters will be revegetated after construction. No permanent impacts from operations and maintenance activities are anticipated. However, the gas pipeline corridor will not provide shrub cover for desert tortoise until the shrubs reach maturity.

d. the new water pipeline.

**Response:** Any segments of water pipeline outside the fenced perimeters will be revegetated after construction. Therefore, only temporary and minimal impacts from operations and maintenance activities are anticipated. However, the gas pipeline corridor will not provide shrub cover for desert tortoise until the shrubs reach maturity.

## Background

As noted in the AFC, ravens are known to prey upon juvenile desert tortoise and other wildlife species. However, ravens are a migratory species and federally protected under the Migratory Bird Treaty Act. Perch-deterrent device installation is mentioned in the AFC on page 5.2-67, but the facilities upon which they would be installed are not specified. In addition, CDFG commented in a March 23, 2007 letter on Victorville 2, another desert solar project, regarding the need for a sufficiently detailed raven control plan.

## Data Request

29. Please provide a detailed raven control plan that discusses, but is not limited to the following elements:
  - a. coordination process with CDFG and USFWS
  - b. area to be covered by the plan

- c. use of perch-deterrent devices and locations of installation
- d. circumstances when nest removal would be necessary
- e. remedial actions that would be employed if evidence of raven predation of juvenile desert tortoise is detected and the circumstances that would trigger the implementation of remedial actions
- f. facility/project owner staff expected to implement the raven control plan and their qualifications

**Response:** As stated in Applicant's December 28, 2007 letter, additional time has been requested to respond to this data request. The Applicant will be coordinating with USFWS and CDFG to develop an approved raven control plan that will be based on plans that have proved successful on other projects.

### **Background**

AFC section 5.2.11.1, Mitigation Measure 1 – Site Rehabilitation Plan, addresses closure of the project following the cessation of facility operations and discusses elements of a project closure plan. Permanent closure is an issue of concern regarding biological resources due to the proposed facility location on a relatively large and undisturbed habitat area as well as the potential threats to biological resources posed by abandoned equipment and hazardous materials.

### **Data Request**

- 30. Please describe the likely components of a closure plan (e.g., decommissioning methods, timing of any proposed habitat restoration, restoration performance criteria), and discuss each relative to biological resources and specifically to desert tortoise and its habitat.

**Response:** As stated in Applicant's December 28, 2007 letter, additional time has been requested to respond to this data request. AFC Page 5.2-59 describes elements of the site rehabilitation plan (for both temporary and permanent impacts). Site decommissioning is not expected to occur for at least 50 years. Habitat restoration performance criteria will be developed in coordination with the resource agencies as part of the desert tortoise mitigation. Details on site decommissioning methods, the timing of habitat restoration, and habitat restoration performance criteria will be provided pending the outcome of these discussions. Information on funding mechanisms, including those that may be in-place in the event of bankruptcy or other financial reasons will also be supplied to the resource agencies during these discussions. Additionally, facility closure requirements of the BLM, County, USACE, USFWS, CDFG and other pertinent agencies will be identified, evaluated, and incorporated into these mitigation and site rehabilitation discussions.

- 31. Describe the potential funding (e.g., a performance bond) and/or legal mechanisms for decommissioning and restoration of the project site that could be used:

- a. at the end of operations; and
- b. in the event of bankruptcy or the untimely project closure for financial reasons.

**Response:** The Applicant has not yet selected a specific legal mechanism for the form of securing decommissioning and restoration of the project site, and the specific legal mechanism selected would depend both upon the amount of bond required and market conditions at the time. As discussed in Data Response 30 above, information on funding mechanisms to support a closure and restoration plan will be supplied to the resource agencies as part of developing the mitigation plan for desert tortoise. A variety of instruments – for example, surety bonds, negotiable securities, Certificate of Deposit or Letters of Credit-- are, in addition to or as a substitute to other legal mechanisms, allowed by the BLM for other energy operators. The Applicant will comply fully with the BLM's Solar Policy and security guidelines.

32. Please provide a discussion of facility closure requirements of the BLM, County of San Bernardino, USACE, USFWS, CDFG, and any other agency that may have closure requirements.

**Response:** For the purposes of responding to this Data Request, facility closure is interpreted to mean permanent closure as defined as a cessation in operations with no intent to restart operations owing to plant age, damage to the plant beyond repair, economic conditions, or other reasons.

The planned life of the generation facility is 50 years. However, if the Ivanpah SEGS were still economically viable, it could be operated longer. It is also possible that the facility could become economically noncompetitive earlier than 50 years, forcing early decommissioning. Whenever the facility is permanently closed, the closure procedure will follow a plan that will be developed consistent with the discussion of Facility Closure in Section 2.4 of the 07-AFC-5 as described expanded below.

The removal of the facility from service, or decommissioning, may range from "mothballing" to the removal of all equipment and appurtenant facilities, depending on conditions at the time. Because the conditions that would affect the decommissioning decision are largely unknown at this time, these conditions would be presented to the CEC, BLM, and other responsible resource agencies (i.e., County of San Bernardino, USACE, USFWS, CDFG) when more information is available and the timing for decommissioning is more imminent. In this regard, agency requirements for addressing facility closure are similar for power generation facilities throughout California. The San Bernardino County Development Code does not specifically address the abandonment requirements for solar energy generating stations.

To ensure that public health and safety and the environment are protected during decommissioning, a decommissioning plan will be submitted to the CEC and BLM for approval prior to decommissioning. The plan will include, but not be limited to the following:

- Proposed decommissioning activities for the facility and all appurtenant facilities constructed as part of the facility
- Conformance of the proposed decommissioning activities to all applicable LORS and local/regional plans
- Implementation of activities necessary to restore the site, if the plan requires removal of all equipment and appurtenant facilities, including required grading and re-contouring involving restoration and re-vegetation, including consultation with BLM and CEC regarding the potential re-establishment of off-road vehicle trails, drainage patterns, and native vegetation (grown or harvested from local seed and plant stock)
- Decommissioning alternatives other than complete restoration
- Associated costs of the proposed decommissioning and the source of funds to pay for the decommissioning

In general, the decommissioning plan for the facility will attempt to maximize the recycling of all facility components. Ivanpah SEGS will attempt to sell unused chemicals and materials back to the suppliers or other purchasers or users. All equipment containing chemicals will be drained and shut down to ensure public health and safety and to protect the environment. All nonhazardous wastes will be collected and disposed of in appropriate landfills or waste collection facilities. All hazardous wastes will be disposed of according to all applicable LORS. The site will be secured 24 hours per day during the decommissioning activities.

ATTACHMENT DR16-1

## **Biological Resources Records of Conversation with CDFG, USACE, and USFWS**

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# CH2MHILL TELEPHONE CONVERSATION RECORD

**Call To:** Shannon Pankratz USACE

**Phone No.:** 213-452-3412

**Date:** April 16, 2007

**Call From:** Russell Huddleston

**Time:** 09:30 AM

**Message  
Taken By:**

**Subject:** Bright Source Energy - Ivanpah Solar Project

**Project No.:** 357891

Purpose of the call was to discuss wetland survey methodology for the Ivanpah Solar Energy Project in Eastern San Bernardino County. Shannon Pankratz (USACE - LA District Regulatory Branch) is the project manager for this area.

Russ explained survey methodology would involve waling linear transects perpendicular to the washes. At each point where the transect line intersected a wash a GPS point would be taken and the general characteristics of the wash would be recorded.

Give the large size of the project area, transects would be spaced roughly 1,000 feet apart.

Recent, high resolution aerial photographs would then be used to manually digitize the washes using the field collected gps data as reference points.

Shannon thought this approach seemed reasonable for this project and was ok with the proposed methodology.

## BrightSource Ivanpah Solar Energy Project

CALL TO: Ray Bransfield with USFWS  
Ventura Office

PHONE NO. 805-644-1766  
Ext 317

DATE: 11 May 2007

CALL FROM: Ray Romero

TIME: 1430

MESSAGE TAKEN BY:

PROJECT NO. 357891.TM.FS

SUBJECT: Desert Tortoise Protocol Survey Timeline

**QUESTION/ISSUE:** Is it ok to extend the desert tortoise protocol survey beyond the May 31 timeline identified in the USFWS protocol?

**RESPONSE:** Ray mentioned that the protocol needs to be revised. He has no problem with us going beyond May 31. I provided some background information on the site and mentioned the sign that has been recorded thus far. I also mentioned that the BLM was the federal lead and that I was coordinating with Charles Sullivan in the Needles Office and that Charles preferred to interface with USFWS on this project. Ray mentioned that he does not recall Charles being in touch with him regarding this project. Ray also mentioned that in his opinion there really isn't the need to perform ZOI transects since we have already demonstrated presence within the project area. Additionally, there is no doubt that we will need to consult under Section 7. We also spoke about the idea of fencing the area and performing a clearance survey before construction. Lastly, he mentioned that had he been involved at the beginning of the project, he may have suggested a subsampling of the site and extrapolating the findings to the unsurveyed areas.

**RESOLUTION/ACTION ITEMS:** I will contact the CEC and BLM biologists to obtain their opinions.

## BrightSource Ivanpah Solar Energy Project

**CALL TO:** Becky Jones with CDFG Palmdale Office

**PHONE NO.** 661-285-5867

**EMAIL ADDRESS:** dfgpalm@adelphia.net

**E:** 12 July 2007

AT

D

**CALL FROM:** Ray R., John C., and Russ H.

**TIME:** 0900-1000 am.

**PROJECT NO.** 357891.TM.PS

**SUBJECT:** Project background and biological survey findings

**QUESTION/ISSUE:** First meeting with CDFG regarding the BrightSource Energy Project. On conference call were John Carrier (PM), Ray Romero (Wildlife), and Russell Huddelston (Wetlands). Amy Hiss (Botany) was unable to attend.

**RESPONSE:** Discussed Bright Source Energy Project background; survey findings; and potential protection measures, mitigation and permits. John discussed background information including project name, location, size, facilities, timing, etc. He also forwarded two figures showing the project overlay on a topo and aerial photo to Becky. Becky is familiar with the site. She asked about any conflicts with the military, proposed airport in Jean, and CHP inspection station near the golf course. We do not anticipate any conflicts. We mentioned past coordination with Ray Bransfield (USFWS), Charles Sullivan (BLM), and Marc Sazaki (CEC). We mentioned that CEC is the state lead and BLM is the federal lead. The environmental documents are anticipated to be a joint effort between the two agencies.

Russ discussed botanical and wetland methodology and survey findings. Several special-status cacti were observed onsite and the proposed salvage plan was mentioned. Becky did not appear to have an issue with salvaging the cacti. Russ also mentioned the numerous washes that were documented. Becky mentioned that CDFG would probably take jurisdiction. Russ mentioned that contact has been made with the USACE and the Lahontan RWQCB would also be contacted. Becky asked if cat claw and mesquite were observed. Russ mentioned cat claw was documented in scattered locations along larger washes only and no mesquite was observed. John mentioned that run off from rainfall events would be allowed to

drain naturally across the site with the exception of berms channelizing water around the power blocks. Becky was concerned about standing water and towers attracting ravens to the site in search of water and roosting/nesting structures. Ray mentioned that these concerns would be addressed and measures proposed in the report.

Becky mentioned potential impacts to raptors from towers and mirrors. She wanted to know if any Gila monsters were observed in the area. Ray mentioned that no Gila monsters were observed during the surveys. Jeff Lovich is producing a paper documenting Gila monster presence in CA. She suggested obtaining a copy once it is released in the next several months. Ray provided information on the tortoise protocol survey methodology; specific findings; and potential protection measures, mitigation and permitting. Proposed measures will be similar to those typically seen in BOs for the tortoise. She may consider a higher habitat compensation ratio than 1:1. A 2080.1 consistency determination may/may not be acceptable. She mentioned several 2080.1 applications have been rejected in the past because the USFWS BO needs to clearly contain enhancement and endowment fees. Becky mentioned that a 2081 could be tiered from the CEC documentation. She needs to review the project materials, etc. before making a decision on additional botanical surveys, protection measures, mitigation, and permitting. However, it is anticipated that a 2081 and SAA will be applicable.

**RESOLUTION/ACTION ITEMS:** As requested, John sent Becky the 300MW project description that was provided to BLM. We will remain in contact with Becky as the project progresses.

<b>TELEPHONE CONVERSATION RECORD</b> CH2M Hill			
ROUTING			DATE: December 21, 2007
1	John Carrier	4	<b>FILE REFERENCE:</b> ISEGS 357891.TM.DR
2	Amy Hiss	5	
3	Marjorie Eisert	6	
NAME		ORGANIZATION NAME AND TELEPHONE NUMBER	
TO: Brian Croft		Fish and Wildlife Service. (951) 697-5365. Brian_Croft@fws.gov	
FROM: John Cleckler		CH2M Hill/SAC. (916) 712-6784.	
SUBJECT: ISEGS biological resources permitting concerns.			
CONVERSATION			
<p>I sent an electronic mail message to Ray Bransfield (Ray_Bransfield@fws.gov) of the Ventura office of the Service on December 20, 2007, to inform Ray that I was brought into the project to help complete the consultation for the ISEGS project following the departure of Ray Romero. I was interested to discuss Service concerns or expectations. Bransfield responded to me on the same day with an electronic mail message stating that the project was assigned to Service staff member, Brian Croft.</p> <p>Brian Croft called me on the morning of December 21, 2007. Due to a prior commitment I had to call Brian back later in the day. The following is a brief summary of that later conversation.</p> <p>Brian works out of the BLM office in Moreno Valley. He just completed some work on a bighorn sheep recovery project. He hasn't work on a section 7 consultation in about 6 months. He has a copy of the ISEGS AFC and is just beginning to review it. Brian hopes to have his AFC review and comments to Misa Ward/CEC by mid-January.</p> <p>Brian was hesitant to enter discussion about expectations or to give guidance because he hadn't adequately reviewed the project. He also said that they didn't realize a BA had been drafted and submitted to the BLM. He thought that was premature based on what he knew of the project's progress. Brian also told me that when the time comes to begin the formal consultation it will be more appropriate for him to discuss the project with the BLM (federal nexus) than with the applicant's consultant. This approach is different than my own experience completing section 7 through the Sacramento office of the Service.</p>			

Brian did not have guidance for me in terms of a raven deterrent plan or tortoise exclusion and under crossings. Approaches are project by project and he didn't know how they would approach this one.

Brian did direct me to the BLM California Desert District website (<http://www.blm.gov/ca/st/en/fo/cdd.html>). The page has a link to "energy" under "programs".

Brian said that a good reference might be the Copper Mountain College Expansion HCP. I found the link to the draft HCP at <http://www.fws.gov/ventura/esprograms/hconservation/hcps.html>. That site also includes a link to the Hyundai Motor Test Track HCP which may be helpful. Brian also mentioned the Clark County HCP.

Being that Brian was involved with bighorn sheep issues I asked about potential sheep issues with ISEGS. He didn't seem to be concerned but again he would have to do further review. Sheep wouldn't be a section 7 issue so California Department of Fish and Game would likely take the lead if it were an issue (my comment).

For compensation, there is likely little private land available in the area and Brian said that acquiring private land in the desert can be difficult. The Service would like to see compensation with a mix of funds dedicated to acquisition and management. He said that Fish and Game and BLM typically take the lead in determining what sort of compensation is appropriate. Brian said that Fish and Game typically like to see 100% acquisition rather than funds for management.

Brian is planning on attending the January 4, 2007, ISEGS workshop.

# Cultural Resources (33 – 42)

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## Background

Table 5.3-3 (p. 5.3-17), entitled “Summary of Sites within 1 Mile of the Project Area of Potential Effect,” includes a column for National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR) eligibility status for the eight previously recorded cultural resource sites listed. The sites are indicated as “Eligible” or “Not Eligible,” in the table, with no indication there or in the discussion of these sites (which follows) of who made the eligibility determination or when. Staff needs more complete information on the eligibility status of these sites to complete its analysis.

## Data Request

33. Please provide the date of the eligibility determination and the name and qualifications (where available) of the evaluator for each of the listed resources.

**Response:** With the exception of CA-SBR-10315H and CA-SBR-7694H, all other sites listed in AFC Table 5.3-3 are outside the Area of Potential Effect of the Ivanpah SEGS project. To clarify the statement made in individual site summary paragraphs within AFC Section 5.3.3.5.1, these other previously recorded resources (SBR-7347H, SBR-7689H, SBR-1083-H, SBR-816, SBR-2342, SBR 6956) are considered to be ineligible, based on the data presented in each DPR site record.

## Background

Figure A-1, in the confidential cultural resources technical report (Appendix 5.3B), depicts the footprint of the proposed Ivanpah 1 site and the locations of the newly identified and recorded cultural resources, indicated as purple lines labeled with resource numbers. There is a purple diamond in the northeast corner of the Ivanpah 1 footprint that is not labeled. Staff needs to know if there is an additional newly identified cultural resource at this site.

## Data Request

34. Please provide three copies of Figure A-1 revised to identify the potential new cultural resource represented by a purple diamond in the northeast corner of the Ivanpah 1 footprint labeled.

**Response:** The purple diamond shape in Figure A-1 of AFC Appendix 5.3B is an errant mark and does not represent a cultural resource.

35. If a Department of Parks and Recreation Form 523 for this potential new resource has not been provided previously, please provide three copies of it.

**Response:** See Data Response 34.

### **Background**

Cultural resource CA-SBR-10315 (Boulder Dam-San Bernardino 115-kV transmission line) is an extant and functioning transmission line, originally built between 1930 and 1931 and determined eligible for the NRHP under criterion A (associated with events that have made a significant contribution to the broad patterns of our history). The AFC's cultural resources discussion of cultural resource CA-SBR-10315 (p. 5.3-18) indicates that the project will tie into this historic and NRHP-eligible transmission line to interconnect to the Southern California Edison (SCE) grid. The AFC's electrical transmission discussion of the tie-in (p. 3-1) states that the transmission line into which ISEGS will interconnect is the El Dorado-Mountain Pass 115-kV line. The discussion provides further details of the interconnection, including the replacement of the existing 115-kV transmission line with a double-circuit 220-kV line and the addition of a circuit to the existing pole line to increase the capacity of the existing El Dorado-Mountain Pass 115-kV line heading southwest. Staff needs to know whether these proposed SCE replacement and upgrading activities would impact the historic and NRHP-eligible cultural resource CA-SBR-10315.

### **Data Request**

36. Please provide a detailed description of SCE's planned replacements for and upgrades to the Boulder Dam-San Bernardino 115-kV transmission line.

**Response:** SCE's planned replacements for and upgrades to the Boulder Dam-San Bernardino 115-kV transmission line are not required for the Ivanpah SEGS project and, as such, are not part of the Ivanpah SEGS project description.

As set forth in Section 3 of the AFC (Transmission System Engineering), SCE has proposed upgrades to the El Dorado-Mountain Pass line to accommodate *other projects* in the interconnection queue (not Ivanpah SEGS). SCE's 115 kV Mountain Pass and El Dorado substations project features are SCE system network upgrades to allow for additional capacity. For additional information on this SCE project, see the description in the AFC at pages 3-1 through 3-6.

Since the planned SCE project is not part of the Ivanpah SEGS project, the Applicant does not control the scope of work that SCE will perform (and it would be inappropriate to speculate on the nature and scope of another's project). Of course, SCE's project will be subject its own NEPA and CEQA-compliant environmental review and permitting processes.

### **Background**

The cultural resources discussion of cultural resource CA-SBR-10315 (AFC pp. 5.3-18–5.3-19) indicates that this line would be the interconnection point for the ISEGS



power output. The discussion also includes the statement that the electrical tie-in would not be an adverse impact because “the physical lines and towers are not considered contributing elements to the significance of the site under criterion A.” Staff needs further information on this resource and this assessment of impact.

### **Data Request**

37. Please provide a discussion by a qualified architectural historian of the proposed project’s impact on resource CA-SBR-10315, addressing integrity in transmission lines under criterion A and the extent of replacement or modification to resource CA-SBR-10315 required for the proposed project’s electrical connection.

**Response:** As stated in Data Response 36, SCE’s planned replacements for and upgrades to the Boulder Dam-San Bernardino 115-kV transmission line are not required for the Ivanpah SEGS project and, as such, are not part of the Ivanpah SEGS project description. In addition, to the best of our knowledge, SCE has not engineered the line crossings or tower placements. The transmission line CA-SBR-10315 has been determined eligible for the National Register of Historic Places, as noted in the California Office of Historic Preservation’s Archaeological Determination of Eligibility List, attached as part of the DPR site record for CA-SBR-10315 provided by CHRIS, and included as part of AFC Appendix 5.3C.

38. Please provide the qualifications of the architectural historian who assessed the proposed project’s impact on resource CA-SBR-10315.

**Response:** A resume for the qualified architectural historian, Jessica Feldman, is provided as Attachment DR38-1.

39. Please provide a copy of the NRHP nomination for this resource.

**Response:** Full documentation of the National Register evaluation and supporting documentation were not provided to the Applicant as part of the CHRIS literature search.

### **Background**

The three phases of the proposed project, Ivanpah 1–3, are to be built on a bajada, a broad apron of sediment that fronts a mountain range, immediately to the west of the Ivanpah Lake playa, a shallow ephemeral lake bed. Since the construction of the project appears to include the contouring of the surface of the site for each project phase, the excavation of trenches for the installation of a natural gas pipeline, and the construction of new site access roads, the consideration of the potential presence of buried archaeological deposits becomes relevant. If the depositional environment across the project site is one of net aggradation or ongoing thickening of surface sediments, archaeological deposits related to the use of former bajada surfaces may lie beneath the present surface of the project site. Staff needs additional information to evaluate the potential for encountering buried archaeological deposits during the construction, operation, and maintenance of the project.

## **Data Request**

40. Please provide a discussion of the historical geomorphology of the project site to better evidence a consideration of the potential there for buried archaeological deposits. The discussion should describe the development of the bajada on which the project area is proposed with a focus on the character of the bajada's depositional regime since the Late Pleistocene era. The basis for the discussion should be data on the geomorphology, sedimentology, pedology, and stratigraphy of the project area or the near vicinity. The source of these data may be a combination, as necessary, of extant literature or primary field research.

**Response:** As stated in Applicant's December 28, 2007 letter, an additional 30 days has been requested to respond to this data request. Applicant intends to provide a response by February 11, 2008.

## **Background**

The construction of the project may produce a stark visual intrusion in the viewshed of the portion of Ivanpah Valley around the Ivanpah Lake playa. Appendix 5-3B does not consider whether the project has the potential to affect Native American traditional use areas in this viewshed. Staff needs additional information to evaluate the proposed project's potential to adversely impact potentially significant ethnographic resources.

## **Data Request**

41. Please provide discussions, on the basis of extant literature and Native American contacts, of known traditional use areas such as rock art sites, shrines, or gathering places in the viewshed of the project that may be subject to the project's visual intrusion, and of the potential presence or absence of other such areas in that viewshed.

**Response:** Information regarding known traditional use areas of Native Americans was requested, as documented in AFC Appendix 5.3A. No specific information regarding the presence of individual resources has been received as of January 9, 2008.

## **Background**

5.3.3.5.1 Archive Research (Records search conducted for the project). BLM policy includes a standard for cultural resources survey reports that requires a section on previous research (records search) for the project area vicinity, as does CA State Historic Preservation Office (February 1990 *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format*). The BLM Cultural Resources Specialist needs a map showing previously surveyed areas and previously recorded sites within one mile of the project area, showing the project area.

**Data Request**

42. Please provide a confidential map showing the project area including:
- a. all previous cultural resource surveys conducted within one mile
  - b. all previously recorded sites within one mile of the project area, as referenced in the application

**Response:** A complete copy of the CHRIS records search was provided in Confidential Appendix 5.3C of the AFC, including maps that depict all previously surveyed areas and previously recorded sites within one mile of the project area. To facilitate your review, new figures have been prepared depicting this information (so that it is easier to read and understand). It is provided under separate cover as Confidential Figure DR42-1.

ATTACHMENT DR38-1

## **Resume**

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# ATTACHMENT DR38-1

## Jessica B. Feldman

Architectural Historian

### Education

M.A., Historic Preservation Planning, Cornell University, 2001

B.A., History, Minor in Art History, William Smith College, 1993

### Distinguishing Qualifications

- Qualified as a historian, an architectural historian, and a historic preservationist under the Secretary of the Interior's Historic Preservation Professional Qualification Standards, as defined in 36 *Code of Federal Regulations* (CFR) 61.
- Experienced in cultural resource investigations in compliance with the National Environmental Policy Act (NEPA), the National Historic Preservation Act (NHPA), and a variety of other federal cultural resource regulations.
- Specializes in the analysis and preservation of historic bridges.

### Relevant Experience

Ms. Feldman is a cultural resource specialist with more than 10 years of experience in compliance with federal, state, and local laws relating to cultural and community resources and land use planning. Ms. Feldman has been extensively involved in the management of and participation in cultural resource investigations in compliance with the National Environmental Policy Act (NEPA), the National Historic Preservation Act (NHPA), and a variety of other federal, state, and local cultural resource regulations. Prior to joining CH2M HILL, Ms. Feldman was the architectural historian for Jones & Stokes (formerly Myra L. Frank and Associates). She was responsible for the preparation of Section 106 documents in support of the Environmental Impact Statement (EIS) for the Dallas Area Rapid Transit (DART) NW alignments and Mid-Jordan Light Rail (Salt Lake City, Utah); preparation of historic bridge evaluations for Caltrans in support of Historic Property Survey Reports and Finding of Effect Reports, used as basis for Environmental Impact Reports (EIRs), for Los Angeles, Riverside, San Bernardino and Madera Counties; preparation of National Register nominations for General Services Administration (GSA)-owned courthouses and post offices throughout the United States; preparation of Historic American Building Survey (HABS) and Historic American Engineering Record (HAER) level data forms for properties in the City of Long Beach.

Past responsibilities included directing a survey team for the Caltrans statewide historic bridge inventory update; leading an intensive architectural survey for the City of Riverside of more than 1,300 parcels in the downtown area, which led to the preparation of determinations of eligibility and historic property inventory forms; surveying proposed Historic Preservation Overlay Zones for the City of Los Angeles to determine contributing

and non-contributing buildings; and conducting historical documentations and evaluations of state-owned buildings in Sacramento, Los Angeles, and Marysville, which resulted in environmental analyses of those structures in anticipation of seismic retrofitting, and/or other proposed alterations.

### **Experience Prior to CH2M HILL**

**Caltrans Historic Bridge Survey—11 Counties Statewide in California.** Architectural Historian/Principal Investigator.; led the team that surveyed 26 concrete box-girder bridges, an important bridge engineering development and design, using the NRHP criteria. In addition, Caltrans requested that the team evaluate 17 tunnels according to the NRHP criteria. The bridges and tunnels were located in 11 counties in California.

**SR 47 Truck Expressway (EIR/EA)—Los Angeles County, California.** Architectural Historian; prepared the HPSR and Finding of Effect report as part of the environmental analyses for the EIR/EA.

**Pleasant Valley Road Widening (IS/MND & CE)—Camarillo, California.** Architectural Historian; prepared HPSR and coordinated ASR and APE with archaeology sub-consultant. An Initial Study and Mitigated Negative Declaration under CEQA and Categorical Exclusion under NEPA were prepared for the proposed widening of Pleasant Valley Road in the city of Camarillo.

**Cypress Avenue Overcrossing Project (IS/EA and ND/FONSI)—Fontana, California.** Architectural Historian.; prepared visual analysis and HPSR as part of the preparation of an IS/EA and supporting technical studies, including noise, biological, visual, relocation, and air quality, for a new overcrossing above the I-10 freeway at Cypress Avenue in Fontana.

**La Loma Bridge Rehabilitation/Replacement Project—City of Pasadena, California.** Architectural Historian; responsible for the preparation of a HPSR and a Finding of Effects report for the proposed replacement/rehabilitation of the La Loma Bridge in the City of Pasadena.

**Mount Vernon Avenue Bridge Project—City of San Bernardino, California.** Architectural Historian; responsible for the preparation of a supplemental HPSR and a Finding of Effects report for the proposed widening and seismic retrofit of Mt. Vernon Avenue Bridge in the City of San Bernardino.

**Avenue 19 East and West Bridge over the Arroyo Seco Channel Replacement Project - Los Angeles, California.** Prepared Negative Historic Property Survey Report (NHPSR).

**Loma Linda Road Alignment Concept Study, PEAR – San Bernardino County, California.** Architectural Historian; coordinated with Chief of Environmental Cultural Studies/Senior Environmental Planner at Caltrans District 8 on several issues relating to the preparation of the PEAR.

**Los Angeles HBRR Bridge Improvement Program Task Orders—Los Angeles, California.** Architectural Historian; prepared HPSRs and Finding of Effects reports for the following projects:

- Fletcher Drive Bridge Seismic Retrofit
- Fourth and Lorena Street Bridge Seismic Retrofit
- Vanowen Street Bridge over Bull Creek Widening Project
- Riverside Drive Bridge Widening Project

- Soto Street Bridge over Mission Road and Huntington Drive Removal Project

**Cottonwood Creek Bridge—Madera County, California.** Architectural Historian/Sole Investigator; conducted a historical and architectural assessment of Cottonwood Creek Bridge after it was damaged during a traffic accident. In order to ensure compliance of Section 106 of the National Historic Preservation Act (NHPA) during a proposed bridge replacement project, Ms. Feldman conducted a field visit and extensive historic research, and prepared historical resources documentation. Her report was used as supporting documentation for a Finding of Effect and Memorandum of Agreement.

### **CH2M HILL Representative Projects**

**FHWA Interstate Highway System: Guidance and Criteria for Evaluating Elements of Exceptional and National Importance.** Ms. Feldman, as a sub-consultant on the Battelle team, is working directly with FHWA Headquarters to identify the elements of the entire 40,000+ mile Interstate Highway system that have national or exceptional historic significance. To identify the elements, Mr. Feldman is also working with the SHPOs, DOTs, and FHWA divisions in 18 states: Alaska, Arizona, Arkansas, California, Colorado, Hawaii, Idaho, Louisiana, Mississippi, Montana, Nevada, New Mexico, Oklahoma, Oregon, Texas, Utah, Washington, and Wyoming. The final list will be published by FHWA in the Federal Register before the 50th anniversary of the Interstate System in June 2006.

**Cultural Resource Specialist; Sellwood Bridge NEPA-EIS; Multnomah County, vicinity of Portland, Oregon; February 2007 to present.** The 1925 Sellwood Bridge is considered functionally obsolete and will be replaced or rehabilitated. In support of an alternatives analysis for the replacement or rehabilitation of the bridge, prepared determinations of eligibility for four historic resources. The four historic resources include the bridge itself, one National Register-listed church, a late 19<sup>th</sup> century cemetery and a structure within the cemetery that was designed by a prominent Portland architect. As of September 2007, preparing the existing setting discussion for historic resources discipline report for the Draft Environmental Impact Statement (Draft EIS).

**Cultural Resource Specialist; Tacoma/Pierce County HOV Project, WBNV and EBNV Connector; Washington Department of Transportation; Tacoma and Pierce County, Washington; August 2006 to present.** Conducted field survey and research, and used this information to prepare the historic context and discipline report for the EIS. This is part of the larger Tacoma/Pierce County HOV project, which will widen 35 miles of Interstate 5 and introduce High Occupancy Vehicle lanes to decrease traffic congestion between the Pierce/King County line and State Route 16 in the Tacoma and Fife area. The proposed project includes the demolition of the Nalley Valley Viaduct, which was evaluated for potential eligibility for the National Register of Historic Places.

**Cultural Resource Specialist; Tacoma/Pierce County HOV Project, Pacific to POT (Port of Tacoma), Environmental Assessment, Washington Department of Transportation; Pierce County, Washington; September 2006 to present.** Conducted preliminary field survey and research of historic resources, and will use this information to prepare the historic context and discipline report for the environmental document. This is part of the larger Pierce

County HOV project, which will widen 35 miles of Interstate 5 and introduce High Occupancy Vehicle lanes to decrease traffic congestion between the Pierce/King County line and State Route 16 in the Tacoma and Fife area. The alignment will require the acquisition of an easement on a potentially historic local park, which will be dealt with through the Section 4(f) process.

**Cultural Resource Specialist; Tacoma/Pierce County HOV Project, POT (Port of Tacoma) to KCL (King County Line), Environmental Assessment, Washington Department of Transportation; Pierce County, Washington; September 2006 to present.** This is part of the larger Pierce County HOV project, which will widen 35 miles of Interstate 5 and introduce High Occupancy Vehicle lanes to decrease traffic congestion between the Pierce/King County line and State Route 16 in the Tacoma and Fife area. Prepared an APE in coordination with WSDOT, which will be the basis for extent of the field survey and research of historic resources.

**Cultural Resource Specialist; Salem River Crossing NEPA-EIS; Marion and Polk Counties, Salem, Oregon; August 2007 to present.** The project proposes to improve mobility and safety across the Willamette River in the Salem-Keizer metropolitan area while alleviating congestion on the Marion and Center Street bridges and on the connecting highway and arterial street systems. In support of a preliminary concept analysis, prepared an evaluation matrix ranking each of the 13 alternatives. Additional work will include the preparation of a Cultural Resources Technical Report in support of the Draft EIS.

**Cultural Resource Specialist; Water Treatment Plant and Bicycle Lake Water Main Extension; U.S. Army and Fort Irwin DPW; Fort Irwin, California; January 2007 to May 2007.** Prepared the cultural resources impacts section for an Environmental Assessment. The proposed project will construct a new water treatment plant and the associated infrastructure to provide potable water to existing and future populations at the facility.

**Task Leader, Cultural Resources; Paducah GNEP Siting Study; Paducah Uranium Plant Asset Utilization, Inc.; vicinity of Paducah, Kentucky; February 2007 to May 2007.** The final product is a site evaluation study or Detailed Site Report which would provide the applicable regulatory, permitting, and licensing requirements that are required or may be required to permit and license a GNEP facility, provide all relevant, readily available environmental regulatory and permitting information for the PGDP and surrounding area that is pertinent to siting a GNEP facility, identify data gaps that will need to be filled for siting a GNEP facility. Prepared relevant sections of the site report relating to cultural resources. This project had a short turn-around and limited hours, with specific protocols, milestones and deadlines that had to be met. In addition, supporting documentation was difficult to obtain but this was accomplished on time.

**Cultural Resource Specialist; Russell City Energy Center, Application for Certification, Calpine Corporation; City of Hayward, California; January 2007 to March 2007.** Prepared appropriate State of California Department of Parks and Recreation forms for the evaluation of three structures located at the project site. This included the preparation of an historic context, requiring intensive research at local repositories, and a site visit. The proposed project, a new energy facility west of the City of Hayward, California, requires a California Energy Commission license. The DPR forms were prepared as part of the supporting documentation for the application of the CEC license.



**Cultural Resource Specialist; PG&E Humboldt Bay Power Plant Modernization Project, Application for Certification, Pacific Gas & Electric; vicinity of Eureka, California; October 2006 to December 2006.** Conducted site visit and prepared evaluation of the power plant as an historic district, according to the State of California Department of Parks and Recreation guidelines and format. PG&E are proposing to upgrade and modernize the plant. The site visit and historic district evaluation were prepared as supporting documentation for the Application of Certification.

**Cultural Resources Specialist; Diestelhorst Bridge Preservation and Rehabilitation Plan; City of Redding; Redding, California; August to December 2006.** Prepared the historic context and applied the Secretary of the Interior's Standards for Rehabilitation of Historic Structures for the Diestelhorst Bridge in Redding, California. The bridge, which was built in 1914, was the first reinforced concrete bridge over the Sacramento River, and its completion linked the Shasta and Siskiyou County seats. The Bridge is eligible for the National Register of Historic Places. The proposed project will convert the structure to a pedestrian facility.

**Architectural Historian/Lead List of Classified Structures (LCS) Historian; National Park Service, National Capital Region; February 1996 to July 1998 and May 1999 to August 1999.** Was responsible for editing and maintaining regional historic structures database; identified, monitored and evaluated cultural resources at regional parks, including Rock Creek Park and Harpers Ferry National Historical Parks; advised park management on treatment of cultural resources; identified potential threats to structures; planned and conducted historical research to be used for park planning documents and Section 110 review; provided peer review for non-point source (NPS) and non-NPS historical studies; supervised seasonal employees and interns; made contributions to the preparation of historic preservation documentation; conducted intensive survey of and compiled background materials on 19<sup>th</sup> century homestead and cemetery sites at Prince William Forest Park; made presentations to park staff and public organizations on research results, and beta-tested new historic structures database for entire national park system.

## **Supplemental Information**

Years Experience Prior to CH2M HILL: 9  
CH2M HILL Hire Date: 06/19/2006

## **Employment History**

Jones & Stokes (formerly Myra L. Frank and Associates); Architectural Historian; November 2000 to June 2006

National Park Service, National Capital Region; Architectural Historian/Lead LCS Historian; February 1996 to July 1998 and May 1999 to August 1999

CONFIDENTIAL FIGURE DR42-1

## **CHRIS Maps**

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These maps are being provided to the CEC Staff under a repeated request for confidentiality.

# Land Use (43 – 52)

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## Background

As stated in the AFC, the July 2002 Northern and Eastern Mojave Desert Management Plan (NEMO) amends the BLM California Desert Area Conservation Plan (CDCA) for the area identified as the Northern and Eastern Mojave Desert. The ISEGS site is located in the southeastern portion of the NEMO Planning Area Boundary. The NEMO Plan addresses threatened and endangered species conservation and recovery and adoption of public land health standards, evaluation of segments for eligibility in the National Wild and Scenic river system, and changes resulting from the California Desert Protection Act passed in 1994. The NEMO Plan also designates routes of travel in Desert Wildlife Management Areas consistent with Federal regulations.

The management of backcountry roads and trails (routes) is an important part of BLM's management of public lands. The use of these routes by Off Highway Vehicles (OHV) and related established recreation activity is a major concern for the BLM. The Ivanpah Valley falls within the NEMO plan amendment area and includes routes of travel designated for OHV use in that land use plan amendment. The ISEGS project overlays several of these routes. The analysis for the project will need to consider the impact to these designated routes and their uses. Where use, if any, will be allowed through or in the vicinity of the project, special prescriptions will need to be discussed. Where use would be discontinued, alternative means of transportation will need to be described. Finally, because the use of routes is such a sensitive subject for the public, consideration should be given to conditions of approval which serve to ensure continued existence of this recreation.

## Data Request

43. Please provide a description of the proposed project's conformance with the Northern and Eastern Mojave Desert Management Plan, including provision for solar electrical generating facilities.

**Response:** During communications with BLM staff (telephone conversations between Jennifer Scholl of CH2M HILL and Tom Hurshman (BLM) and George Meckfessel (BLM) on January 9, 2008), this request was clarified. The Northern and Eastern Mojave Desert Management Plan (NEMO) does not include policies. The BLM California Desert Conservation Area (CDCA) Plan includes policies that apply to new uses within the CDCA. As requested in Data Request 50, pursuant to the CDCA Energy Production and Utility Corridors Element, Implementation Section on page 95, "sites associated with power generation or transmission not identified in the [CDCA] Plan will be considered through the [CDCA] Plan Amendment Process." Although the CDCA Plan identifies solar generating plants as an allowable use on Multiple Use L and M designated land, which is the designation of land at the

Ivanpah site, the Ivanpah site was not specifically identified in the Plan. The Amendment Process is outlined in CDCA Plan Chapter 7, Plan Amendment Process. The Applicant acknowledges the need to comply with the BLM Plan Amendment Process so that the Ivanpah site will be specifically designated for solar generation. Based upon the conversations with BLM staff, it is expected that the CEC/BLM MOU for joint application processing including the joint CEQA/NEPA environmental review, will be adequate to support the BLM Plan Amendment Process.

44. Provide a complete inventory and assessment of travel routes within and adjacent to the planning area using the California BLM Route Inventory Data Dictionary.

**Response:** AFC Figure 5.12-2 shows existing travel routes within and adjacent to the three phases of Ivanpah SEGS. Based upon communications with BLM staff noted in Data Response 43, BLM staff are requesting that information be developed that identifies the present status of these routes and whether they are categorized as Open, Closed, or Limited uses. Therefore, the Applicant is working with BLM staff to identify the current status of these routes. The Applicant acknowledges that if it is determined that the travel routes in the area of the Ivanpah SEGS could be disturbed through implementation of the three phases of the project, then a plan will need to be developed in coordination with BLM that addresses the need to close and/or re-locate these routes. As necessary, this plan will also identify all fencing, gates, and dust abatement measures that would be taken to manage the use of the routes designated open within and adjacent to the facility.

45. Identify all routes that would be closed due to development of the facility.

**Response:** This information will be provided pending receipt of information described in Data Response 44.

46. Identify all routes that would be rerouted and would be proposed for new alignment.

**Response:** This information will be provided pending receipt of information described in Data Response 44.

47. Identify all routes that would remain open to the public.

**Response:** This information will be provided pending receipt of information described in Data Response 44.

48. Identify all fencing, gates, and dust abatement measures that would be taken to manage use of routes designated open within and adjacent to the facility.

**Response:** This information will be provided pending receipt of information described in Data Response 44.

49. Please develop appropriate mitigation for numbers 42 through 45.

**Response:** Applicant assumes this question is referring to numbers 45 through 48.

Mitigation measures will be developed pending receipt of information described in Data Response 44.

### **Background**

As stated in the Ivanpah Solar Electric Generating System (ISEGS) AFC, the ISEGS site is located within areas in the CDCA that are designated Multiple-Use Class L (Limited Use) and Multiple-Use Class M (Moderate Use) according to the CDCA Map 1 Land-Use Plan 1999 (BLM, 1999). The Energy Production and Utility Corridors Element of the CDCA Plan (BLM, 1999) states that the BLM focuses on the same factors affecting public lands and their resources as those used by the CEC. These factors include: (1) consistency with the CDCA Plan, including the designation of proposed planning corridors; (2) protection of air quality; (3) impact on adjacent wilderness and sensitive resources; (4) visual quality; (5) fuel sources and delivery systems; (6) cooling-water source(s); (7) waste disposal; (8) seismic hazards; and (9) regional equity.

### **Data Request**

50. Please provide description of the proposed project's conformance with the CDCA Plan, including provision for solar electrical generation facilities located in lands designated as multiple use class L and M (Table 1). Discuss the need to amend the plan (Energy Production and Utility Corridors Element, Implementation page 95 and Decision Criteria, page 93) and the proposed schedule for the amendment process.

**Response:** Please refer to Data Response 43.

### **Background**

As stated in the AFC, the ISEGS site is located within the existing BLM Clark Mountain Allotment Grazing Lease (Clark Mountain, allocation #09003). The ISEGS 7,040-acre BLM (11 square miles) property boundary area is part of a larger 97,560-acre (150 square miles) grazing lease.

Pursuant to 43 CFR 4100, Section 4110.4-2(2)(b) Grazing Administration, the process to withdraw a BLM grazing lease to allow development requires a 2-year notification be given to the lease holder prior to the start of development. This notification would inform the lease holder that a portion of the grazing lease has been withdrawn. It is also possible for the grazing lessee to waive notice. It may be necessary for BLM to issue a decision with regard to removing land from the grazing allocation as part of the ISEGS Record of Decision.

### **Data Request**

51 Please state which of the above methods (i.e., notification of withdrawal of a portion of the grazing lease), will be used to withdraw the ISEGS site from the

existing BLM Clark Mountain Allotment Grazing Lease (Clark Mountain, allocation #09003).

**Response:** Steve De Young, BrightSource Energy's Director of Environmental Safety and Health, has met with and had numerous conversations with Mr. Jay Moon, the lessee for the portion of the Clark Mountain Allotment upon which the Ivanpah SEGS is to be located. Mr. De Young and Mr. Moon have discussed Mr. Moon's grazing practices and potential future needs resulting from the location of the Ivanpah SEGS project with the intended goal of reaching an agreement with Mr. Moon. Applicant and Mr. Moon have tentatively agreed to meet again in January 2008 to further our discussions. Applicant will keep BLM and the CEC informed as to the progress of these discussions.

52. Provide any written documentation that would address or explain the method described in the data request above.

**Response:** See Data Response 51. Documentation will be provided to BLM and the CEC upon completion of discussions with Applicant and Mr. Jay Moon.

# Soils and Water Resources (53 – 80)

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## Background

As described in the October 18, 2007 RWQCB letter (posted on the CEC's project webpage), specific post-construction stormwater controls are not discussed in the AFC. The RWQCB requires Low Impact Development (LID). The goal of LID is to maintain landscape functionality equivalent to predevelopment hydraulic conditions and minimize the generation of non-point source pollutants. To accomplish these goals, LID principles include:

- Helping maintain natural drainage paths and landscape features to slow and filter runoff and maximize groundwater recharge.
- Reducing the impervious ground cover created by development of the project and the associated transportation network.
- Managing runoff as close to the source as possible.

CEC and BLM staff need to see how principals of LID will be incorporated into the project design. Natural drainage features and patterns must be maintained to the extent feasible. Staff needs to evaluate designs that minimize impervious surface, such as permeable surface parking areas, directing runoff onto vegetated areas using curb cuts and rocks, swales, etc., and infiltrating runoff as close to the source as possible to avoid forming erosion channels.

The project must incorporate measures to ensure that stormwater generated by the project is managed onsite during both pre-construction and post-construction with development features that span the drainage channels or allow for broad crossings. Design features should be incorporated to ensure that runoff is not concentrated by the proposed project, thereby causing downstream erosion.

A draft copy of the Industrial Stormwater Pollution Prevention Plan (SWPPP) is presented as Appendix 5.15A. Section 2.4 (Description of Storm Drainage System and Outfalls) of the Industrial SWPPP discusses the proposed project grading and control measures for managing stormwater runoff. The project is proposing to maintain existing sheet flow conditions where possible, except in the power block area. Section 5.11.6.2 (Permanent Erosion Control Measures) of the AFC discusses in general terms the type of permanent soil erosion control measures that can be expected at the project site and that will be included as part of the final SWPPP.



## **Data Request**

53. Please provide a project grading plan.<sup>1</sup>

**Response:** A conceptual grading plan was provided as part of AFC Appendix 5.15A , Construction SWPPP – Attachment B. In addition, by February 11, 2008, the Applicant will provide details for typical rock filters and other flow and erosion control features as part of the Draft Drainage Erosion and Sediment Control Plan Data provided in Data Response 57.

54. Provide an appropriately scaled detailed drawing of the location of all project access routes and indicate whether these are paved, graveled, or graded. This should include the access routes to and between the heliostat mirrors.

**Response:** As stated in Applicant's December 28, 2007 letter, an additional 30 days has been requested to respond to this data request. Applicant intends to provide a response by February 11, 2008.

55. Provide a calculation of the amount and area of compacted soils resulting from biweekly traverses by a truck mounted tanker for washing of heliostat arrays and cutting of vegetation.

**Response:** As discussed at the January 4, 2008 workshop, the area of compacted soil will be determined on a square foot basis and an estimated change in soil permeability will be evaluated. As stated in Applicant's December 28, 2007 letter, an additional 30 days has been requested to respond to this data request. Applicant intends to provide a response by February 11, 2008.

56. Provide a discussion and calculations establishing that the proposed stormwater management system has sufficient capacity for a 100-year flood storm.

**Response:** Calculation of the pre- and post-development 100-year flood stormwater rates are included in AFC Appendix 5.15D, Preliminary Stormwater Calculations. These calculation will be revised as necessary based on the storm compaction evaluation completed as part of Data Response 55.

## **Background**

To determine the potential erosion impacts to water and soil resources from construction of the project, the California Energy Commission (CEC) requires a draft Drainage Erosion and Sediment Control Plan (DESCP). The draft DESCP is to be updated and revised as the project moves from the preliminary to final design phases and is to be a separate document from the construction Storm Water Pollution Prevention Plan (SWPPP). The final DESCP, submitted prior to site mobilization, must be developed and signed by a professional engineer/erosion control specialist.

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<sup>1</sup> Response to this item can be addressed in the draft Drainage Erosion and Sediment Control Plan requested in #57.

## Data Request

57. Please provide a draft DESCP containing elements A through I listed below. These elements will outline site management activities and erosion/sediment control Best Management Practices (BMPs) to be implemented during site mobilization, excavation, construction, and post-construction activities. The level of detail in the draft DESCP should correspond to the current level of planning for site construction and corresponding site grading and drainage. Please provide all conceptual erosion control information for those phases of construction and post-construction that have been developed or provide a statement when such information will be available.
- a. Vicinity Map: A map(s) at a minimum scale 1"=100' shall be provided indicating the location of all Project elements and depictions of all significant geographic features including swales, storm drains, and sensitive areas.
  - b. Site Delineation: All areas subject to soil disturbance, such as the construction area, laydown area, parking area, all linear facilities, and landscaping areas shall be delineated showing boundary lines and the location of all existing and proposed structures, pipelines, roads, and drainage facilities.
  - c. Watercourses and Critical Areas: The DESCP shall show the location of all nearby watercourses including swales, storm drains, and drainage ditches. Indicate the proximity of those features to the Project construction, laydown, and landscape areas and all transmission and pipeline construction corridors.
  - d. Drainage Map: The DESCP shall provide a topographic site map(s) at a minimum scale 1"=100' showing existing, interim, and proposed drainage systems and drainage area boundaries. On the map, spot elevations are required where relatively flat conditions exist. The spot elevations and contours shall be extended off-site for a minimum distance of 100 feet in flat terrain.
  - e. Drainage of Project Site Narrative: The DESCP shall include a narrative of the drainage measures to be taken to protect soil and water resources onsite and downstream. The narrative shall include a summary of the hydraulic analysis prepared by a professional engineer/erosion control specialist. The narrative shall state the watershed size in acres that was used in the calculation of drainage measures. The hydraulic analysis should be used to support the selection of BMPs and structural controls to divert off-site and on-site drainage around or through the construction and laydown areas.
  - f. Clearing and Grading Plans: The DESCP shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross-sections, or other means. The locations of any disposal areas, fills, or other special features shall also be shown. Illustrate existing and proposed topography tying in proposed contours with existing topography.

- g. Clearing and Grading Narrative: The DESC shall include a table with the quantities of material excavated or filled during construction in all area such as the construction area, laydown area, and transmission and pipeline corridors. This table shall identify whether the materials removed and brought in were temporarily or permanently added or removed and the amount of such material brought in or removed.
- h. Best Management Practices Plan: The DESC shall identify on the topographic site map(s) the location of the site specific BMPs to be employed during each phase of construction, initial grading, project element excavation and construction, and final grading/stabilization. BMPs shall include measures designed to prevent wind and water erosion. Treatment control BMPs used during construction should enable testing of groundwater and/or stormwater runoff prior to discharge.
- i. Best Management Practices Narrative: The DESC shall show the location (as identified in H above), timing, and a maintenance schedule of all erosion and sediment control BMPs to be used prior to initial grading, during project excavation and construction, final grading/stabilization, and post-construction. Separate BMP implementation schedules shall be provided for each phase of construction. The maintenance schedule should include post-construction maintenance of structural control BMPs or a statement provided when such information will be available.

**Response:** As stated in Applicant's December 28, 2007 letter, an additional 30 days has been requested to respond to this data request. Applicant intends to provide a response by February 11, 2008.

## **Background**

Approximately 3,400 acres of land will be disturbed by the project construction activity. Section 5.11.4.6 (Construction) of the AFC states that "...substantial water erosion and dust control measures will be required to prevent an increased dust load and sediment load to ephemeral washes on and off the project site." In section 4.2.4 (Erosion Control) in the AFC, year-round and rainy season erosion control practices are discussed. To the extent not discussed in Item 57 above, please provide the following information.

## **Data Request**

- 58. Describe in detail the purpose, construction, and effectiveness of the controls to protect slopes susceptible to erosion and the controls to stabilize non-active areas, and provide an appropriately scaled map showing the location and engineering drawings illustrating the construction of these controls.

**Response:** This information will be provided in the DESC as part of Data Response 57.

59. Describe and illustrate the measures to maintain the integrity of existing onsite and adjacent offsite drainages and how existing drainages would be altered.

**Response:** This information will be provided in the DESCP as part of Data Response 57.

60. Describe and illustrate the purpose, construction, and effectiveness of proposed rock filters, local diversion berms, and how existing drainage patterns would be altered.

**Response:** As stated in Applicant's December 28, 2007 letter, an additional 30 days has been requested to respond to this data request. Applicant intends to provide a response by February 11, 2008.

### **Background**

Section 5.11.4.6 (Construction) of the AFC discusses stockpiling soil from grading operations. An estimated 156,875 cubic yards of material will be cut and reused as fill at the site. The cut soil will have to be stockpiled at a staging area prior to use as fill, and the topsoil will be separately stockpiled from the underlying soil. In addition, an estimated 412,600 cubic yards of vegetation will be generated and available as mulch for erosion control. To minimize and control soil erosion and transport, a DESCP and SWPPP would be developed.

### **Data Request**

61. Discuss how the site will be "balanced" between the shortfall of cut soil to fill soil.

**Response:** The site will be a "balanced" site, meaning no soil will be brought in or taken off the site.

62. Please provide details for soil sources addressing whether soil will be obtained locally or transported in from another location.

**Response:** The site will be a "balanced" site, meaning no soil will be brought in or taken off the site.

63. Describe and illustrate the soil stockpile staging locations, confirming the locations would be within the proposed project footprint or within an area to which the applicant has legal access.

**Response:** Please see Data Response 6.

### **Background**

A Federal Clean Water Act section 401 certification may be required. If there are potential impacts to surface waters (perennial and ephemeral) of the State and/or Waters of the United States, such as drainages, streams, washes, ponds, pools, and wetlands, this certification will be required from the RWQCB. These impacts need to be quantified and mitigated. Please refer to:

[http://www.waterboards.ca.gov/lahtontan/401WQC/401WQC\\_Index.htm](http://www.waterboards.ca.gov/lahtontan/401WQC/401WQC_Index.htm).

## **Data Request**

64. Please discuss in detail whether a 401 certification is required. If required, please discuss compliance with the RWQCB requirements discussed on the following RWQCB webpage:  
<http://www.waterboards.ca.gov/lahtontan/401WQC/401instructions2app.pdf>.

**Response:** RWQCB 401 certification will be required for any features identified in the project area that are determined to be jurisdictional waters of the United States and or jurisdictional waters of the State. As stated in Data Responses 18 and 19, a wetland delineation will be submitted to the USACE no later than March 28, 2008. Once the results of the wetland delineation are determined complete by the USACE and the delineation has been verified discussions with RWQCB will be held to determine if any areas not considered waters of the U.S. would be considered waters of the State. Mitigation measures will be developed in consultation with the USACE and RWQCB once the extent of jurisdictional waters has been determined and verified by the regulatory agencies.

65. Submit a jurisdictional delineation to the USACE, a section 401 water quality certification application to the RWQCB, and a Streambed Alteration Notification package to the CDFG. Provide copies of all these documents to the BLM and CEC. This response may be prepared in conjunction with the response to related Biological Resources data requests.

**Response:** As stated in Data Responses 18 and 19, a wetland delineation report will be submitted to the USACE no later than March 12, 2008. A field verification meeting with the USACE will be requested as part of the wetland delineation submittal. Once the results of the wetland delineation are determined complete by the USACE, discussions with CDFG and RWQCB will be scheduled and held.

## **Background**

Section 3.2.2 (Heliostat Erection) of Appendix 5.15A of the AFC discusses the use of at least two pre-casting assembly sheds for each heliostat construction. These pre-assembly sheds will be approximately 100 feet by 100 feet and used for pre-casting heliostat bases and for assembling heliostat structures to mirrors.

## **Data Request**

66. Please describe and illustrate the dimensions of the pre-casting sheds.

**Response:** According to the lessons learned as a result of continuing design testing and refinement, concrete bases are not required for the heliostats. A driven steel pile method will be employed. Therefore, pre-casting sheds will not be required.

67. Please provide a map showing the shed locations.

**Response:** See Data Response 66.

## Background

San Bernardino County Ordinance No. 3872 applies to groundwater management in the unincorporated, non-adjudicated desert region of the county. San Bernardino County (County) and Bureau of Land Management (BLM) have entered into a Memorandum of Understanding (MOU) that provides that BLM will require conformance with County Ordinance No. 3872 for all projects proposing to use groundwater from beneath Public Lands. The MOU also provides that the County and BLM will work cooperatively to ensure that conditions required of project applicants will jointly conform to applicable local, state, and federal laws and regulations.

## Data Request

68. Please provide copies to the BLM of all correspondence, including applications, data, and approvals, with or between the County, for permitting water wells associated with the proposed project.

**Response:** At the time of preparation of this Data Response, no correspondence has occurred between the Applicant and the County with respect to permitting water wells associated with the proposed project. Applicants typically do not file for the well permit at this stage in development, though the wells are included in the environmental analyses for the project. The well permit would be issued using the joint CEC-BLM environmental document to provide necessary environmental clearance.

69. Discuss and provide a process diagram of the type of treatment system that will be employed to provide boiler make-up water and heliostat wash water.

**Response:** Both the heliostat wash water and the boiler makeup water will be drawn from one of the two onsite water wells and stored in the raw water tank. A treatment system consisting of granular activated carbon filters, de-ionization media, and mixed bed demineralizers will treat the water. Chemicals will also be added during the de-ionization process to prevent scaling and corrosion. The water treatment process has no reject streams, so therefore no water is lost. Any regeneration of the de-ionization treatment plant or the mixed bed demineralizers will be done offsite by the water treatment system vendor. Water will flow through the treatment system at approximately 2.5 m<sup>3</sup>/hr (11 gpm) and be stored in the boiler makeup storage tank. Boiler blowdown from the steam boiler will provide high quality water for mirror washing. Condensate from the boiler blowdown will be stored in three condensate tanks and approximately 60 m<sup>3</sup>/night (16,000 gallons/night) of water will be used for heliostat mirror washing. Please refer to AFC Figure 2.2-6 (DWG 01-PB-F-D-100 Rev A), a process diagram of the water treatment system.

70. Please provide details as to the operation of this treatment plant, including any wastewater streams that may emanate from it.

**Response:** There will be no "wastewater" streams from the operation of the treatment plant. All end use streams will be used for operational purposes. Please refer to AFC Section 5.15.3.3 Water Supply, Use, and Wastewater Discharges and Disposal for any

additional information regarding the water discharge, and refer to AFC Figure 2.2-6 (DWG 01-PB-F-D-100 Rev A), a process diagram of the water treatment system.

71. Address whether a reverse osmosis unit will be employed and, if so, the amount, character, and method of disposal of the wastewater, including whether return of the wastewater to the groundwater is planned.

**Response:** Reverse osmosis (RO) will not be used for water treatment. Water de-ionization will be completed through cation, anion and mixed bed vessels with no waste streams. Regeneration of the vessels will be done offsite by the system vendor. Filter backwash flows will be recycled back to the water treatment system.

## **Background**

A letter, dated October 18, 2007 by the RWQCB, reports that MolyCorp intends to resume mining operations, near the ISEGS project area, in the future. MolyCorp may resume operations and groundwater pumping, and if so, the existing nitrate groundwater contamination plume below the MolyCorp New Ivanpah Evaporation Pond may migrate. Please note that in the Groundwater Availability Report, Appendix 5.15C of the AFC, it is not clear whether the estimated future 400 acre-feet per year of groundwater pumping at MolyCorp was incorporated into the conclusions about the projects' cumulative impacts on groundwater. Also, several groundwater models and assumptions were discussed in the Groundwater Availability Report, but it is not clear what assumptions and model were used in the conclusions of the report.

## **Data Request**

72. Please provide a revised groundwater model that assumes MolyCorp resumes operations and incorporates potential pumping at MolyCorp; or provide an explanation of how the scenario of MolyCorp renewed pumping is included in the report conclusions.

**Response:** The renewed pumping by MolyCorp was included in future (with the proposed project) groundwater budget analysis for the Ivanpah Valley. This analysis was conducted to determine inflows and outflows in both the north Ivanpah Valley and south Ivanpah Valley basins and thus determine overall changes in the amount of groundwater in storage. The analysis is discussed on page 16 of AFC Appendix 5.15C and the results are summarized in Table 5.2 of Appendix 5.15C. The analysis follows the groundwater budget principles outlined in Section 4.1 on page 11 of Appendix 5.15C. For the analysis, it was assumed that future groundwater pumping by MolyCorp would be on the order of 420 ac-ft/yr and that this pumping would result in no return flows to the basin (all water is evaporated in wastewater ponds located at the mine; ENSR, 2000). As shown in Table 5.2 and discussed in Section 6, resumed pumping at the MolyCorp mine in combination with the proposed project would result in approximately 2,800 ac-ft/yr outflow from the south Ivanpah Basin, while recharge and return flows from other users is about 4,800 ac-ft/yr. Thus, recharge and return flows exceed pumping by about 2,000 ac-ft/yr with operation of both the proposed project and the re-operation of the MolyCorp Mine.

73. Provide an estimate on how the nitrate plume will be hydraulically affected.

**Response:** As shown in AFC Figure 5.2 and described in Section 5.0 of AFC Appendix 5.15C, groundwater elevation declines due to the proposed project would be minor. Over the 50-year life of the project, and assuming 100 ac-ft/yr extraction for project uses, groundwater elevations would decline on the order of 2.1 feet at 0.5 mile from the well site; 1.4 feet at 1 mile from the well site; and 0.8 feet at 2 miles from the well site. The old Molycorp Evaporation Ponds are over 6 miles from the project wells and the new evaporation ponds are over 4 miles from the project wells. Thus, impacts to overall groundwater elevations at the old and new evaporation ponds are expected to be minor.

Additionally, an analysis was conducted to determine the rate of induced groundwater movement (gradient and velocity) at both the old and new evaporation ponds. This analysis was conducted using the WTAQ model (Barlow and Moench, 1999). This program is described in Section 5.0 on page 16 of Appendix 5.15C. Briefly, the program is used for calculating the drawdown due to pumping from a well that only partially penetrates the overall groundwater system. The input parameters include horizontal hydraulic conductivity, vertical hydraulic conductivity, specific storage, specific yield, aquifer-system thickness, and well-screen. The parameter values are listed in Table 5.1 of Appendix 5.15C. Due to different hydrogeologic conditions in the center of the Ivanpah Valley, where the Molycorp old and new evaporation ponds are located, an effective porosity of 20 percent was used to provide a more conservative analysis.

Rates of induced groundwater movement are shown in Figure DR73-1 for the old Molycorp Evaporation Ponds and Figure DR73-2 for the new Molycorp Evaporation Ponds. As shown in these figures, the project would result in minor changes to the groundwater gradient and groundwater velocity at both the old and new Molycorp evaporation ponds. These changes would result in a negligible migration of groundwater under the evaporation ponds as a result of the project.

74. Provide an explanation of why the poorer quality groundwater from the Molycorp percolation ponds will not migrate to the area of higher groundwater quality at the edge of the Ivanpah Valley due to the projects' groundwater pumping.

**Response:** See Data Response 73.

75. Please quantify the impact to the wells of other groundwater users by the proposed project over the life of the project. If additional groundwater calculations are required to answer this question, please discuss the assumptions and calculations used.

**Response:** As shown in Figure 5.2 and described in Section 5.0 of AFC Appendix 5.15C, groundwater elevation declines due to the proposed project would be minor. Over the 50-year life of the project and assuming 100 ac-ft/yr extraction for project uses, groundwater elevations would decline on the order of 2.1 feet at 0.5 mile from the well site, 1.4 feet at 1 mile from the well site, and 0.8 feet at 2 miles from the well site. The nearest groundwater wells to the site are the Primm golf course wells, which are



located about 0.5 mile from the project wells. Over the life of the project, groundwater elevations in these wells would decline about 2.1 feet. A decline of about 2.1 feet in the groundwater elevations at the golf course wells is not anticipated to negatively impact the use of those wells, nor is this amount expected to affect the production rate of those wells such that they could no longer support the golf course.

76. If the wells of other groundwater users are negatively affected by the project's use of groundwater or by the cumulative use of groundwater, please discuss the need to provide alternative groundwater well locations and the specific location of those wells.

**Response:** See Data Response 75. Because the project wells are not anticipated to negatively impact the use of these wells or affect the production rate of these wells such that they could no longer support the golf course, no alternative groundwater well locations have been identified.

77. Provide a comprehensive list of all existing and anticipated groundwater uses and amounts for all other planned or reasonably foreseeable developments within Ivanpah Valley. If this list is different than that used in the report, please revise the report data and conclusions accordingly.

**Response:** Existing groundwater uses are described in AFC Section 5.15.3.1.2 on page 5.15-9 and 5.15-10. AFC Table 5.15-2 provides existing groundwater uses and amounts in the Ivanpah Valley. This information is also provided in AFC Appendix 5.15C, Section 4.2 and listed in Table 4.1 of that appendix.

The following is a comprehensive list of anticipated groundwater uses and amounts for all other planned or reasonably foreseeable developments in the Ivanpah Valley:

- **Desert Xpress Rail Line** – The Desert Xpress is a proposal to build a privately funded passenger train from Victorville, California, to Las Vegas, Nevada, using high-speed rail technology. As described in the Scoping Report for that project (Federal Railroad Administration, 2006) only two rail stations are being considered, one in Victorville and one in Las Vegas. Under this condition, the Desert Xpress Rail Line would not use groundwater from the Ivanpah Valley for operations as no station or other facilities needing a continuous water supply would be constructed in the Ivanpah Valley. The source of water for construction activities related to the Desert Xpress is not known at this time; however, it is reasonable to assume that the Desert Xpress could use groundwater from the Ivanpah Groundwater Basin during construction. The amount of water needed for construction activities is not known; however, this is anticipated to be a one-time use and is not anticipated to result in long-term impacts in the Ivanpah Groundwater Basin.
- **Interstate 15 Improvements** – Caltrans has an ongoing plan for improvements to Interstate 15 (I-15) that include: 1) a proposed point-of-entry inspection station near the California-Nevada border; 2) a 12-mile-long northbound truck descending lane and pavement rehabilitation; and 3) regrading of median slopes. All of these actions would require water for construction activities and it is

reasonable to assume that these activities could use groundwater from the Ivanpah Groundwater Basin during construction. However, similar to the Desert Xpress described above, the amount of water needed for construction activities is not known. Water use for construction is anticipated to be a one-time use and is not anticipated to result in long-term impacts in the Ivanpah Groundwater Basin. The point-of-entry inspection station would require a long-term water supply for operations, including restrooms, showers, and cleaning. This supply is expected to be minimal.

- **Las Vegas Valley Water District Pipeline** – The Las Vegas Valley Water District has proposed construction and operation of a water supply pipeline from the existing 2420 Zone Bermuda Reservoir (located in southern Las Vegas) to Jean, Primm, the Southern Nevada Correctional Center, and the proposed Ivanpah Valley Airport. Construction of the pipeline would likely require water and it is reasonable to assume that the pipeline project could use groundwater from the Ivanpah Groundwater Basin during construction. The amount of water needed for construction activities is not known; however, this is anticipated to be a one-time use and is not anticipated to result in long-term impacts in the Ivanpah Groundwater Basin. Additionally, the use of imported surface water in the Ivanpah Basin would result in additional discharges of wastewater. At least a portion of this wastewater would likely infiltrate to the groundwater basin, increasing groundwater recharge in the basin.
- **Southern Nevada Supplemental Airport (Ivanpah Valley Airport)** – The Clark County Department of Aviation is proposing to construct a new supplemental commercial service airport in the Ivanpah Valley (Ivanpah Valley Airport). The new airport is anticipated to use water supplied by the Las Vegas Valley Water District pipeline for both construction and operation activities and is not anticipated to use groundwater.
- **Table Mountain Wind Energy Facility** – Table Mountain Wind Company, LLC is proposing to develop a nominal 150 to 205 MW wind-powered electric generation facility and ancillary facilities located at the south end of the Spring Mountain Range between the communities of Goodsprings, Sandy Valley, Jean, and Primm, Nevada. Construction activities would likely require water for dust control and it is reasonable to assume that the project could use groundwater from the Ivanpah Groundwater Basin during construction. The amount of water needed for construction activities is not known; however, this is anticipated to be a one-time use and is not anticipated to result in long-term impacts in the basin.
- **Re-operation of the Molycorp Mine** – The Molycorp Mine is expected to restart operations within about the next year (sometime in 2008). The long-term plan for the mine is to pump about 420 ac-ft/yr within the Ivanpah South Basin (ENSR Corporation, 2000).

Overall, the Desert Xpress Rail Line, Interstate 15 Improvements, Las Vegas Valley Water District Pipeline, and Table Mountain Wind Energy Facility are assumed to use groundwater during construction. The amount of water needed for these construction activities is not known and would depend on the area disturbed by

each project and resulting air quality impacts. Therefore, construction water use for these projects was not included in the groundwater analysis. However, construction water use for each project would represent a one-time water use and is not anticipated to result in long-term impacts in the basin.

The I-15 Improvements (proposed point-of-entry inspection station and re-operation of the MolyCorp Mine) have the potential to result in long-term groundwater use for operations. The I-15 Improvements (proposed point-of-entry inspection station) was not included in the groundwater analysis because the supply is minimal (likely around or less than 10 ac-ft/yr). The re-operation of the MolyCorp Mine was considered in the groundwater analysis in the AFC.

78. Please quantify the cumulative impact by all projects discussed in section 5.15.5 (Cumulative Effects).

**Response:** See Data Response 77 for a description of the cumulative projects. As described above, most of the cumulative projects would require a one-time use of groundwater for construction-related activities. Two projects (I-15 Improvements proposed point-of-entry inspection station and re-operation of the MolyCorp Mine) would require a long-term operational use of groundwater. The annual amount used by the I-15 Improvements proposed point-of-entry inspection station is expected to be minimal. The re-operation of the MolyCorp Mine is anticipated to require about 420 ac-ft/yr. Two projects, the Las Vegas Valley Water District Pipeline and the Ivanpah Valley Airport are likely to result in increased recharge to the groundwater basins as a result of the use of imported surface water in the Ivanpah Basin and subsequent additional discharge of wastewater. However, the amount imported to the Ivanpah Basin via the Las Vegas Valley Water District Pipeline and the amount discharged from the Ivanpah Valley Airport (and potentially other users of the imported water) is not known at this time. Because there is not sufficient information on the amount of groundwater used and resulting return flows from the cumulative projects, it would be speculative at this time to quantify the cumulative impact of all of these projects.

## **Background**

A letter, dated October 25, 2007 by the RWQCB, states that,

"The proposal to pump an additional 100 acre-feet per year of groundwater from the eastern edge of the Ivanpah Valley could adversely affect groundwater quality. The additional groundwater withdrawal may create a pumping depression at the edge of the Valley where the quality of groundwater is good. This may cause poorer quality groundwater in the center of the Valley to migrate to the pumping depression where the quality of groundwater is higher. At the center of the Valley, there is both naturally-occurring poor quality groundwater and groundwater whose quality has deteriorated further due to percolation of wastewater from waste disposal ponds to groundwater. The ponds are owned by MolyCorp, Inc."

### **Data Request**

79. Please provide a detailed discussion regarding potential degradation of water quality due to the creation of a pumping depression at the edge of the Ivanpah Valley. This discussion should include an explanation of why poorer quality groundwater from the center of the valley will not migrate to the area of higher groundwater quality at the edge of the valley. This explanation may require further groundwater modeling.

**Response:** See Data Response 73.

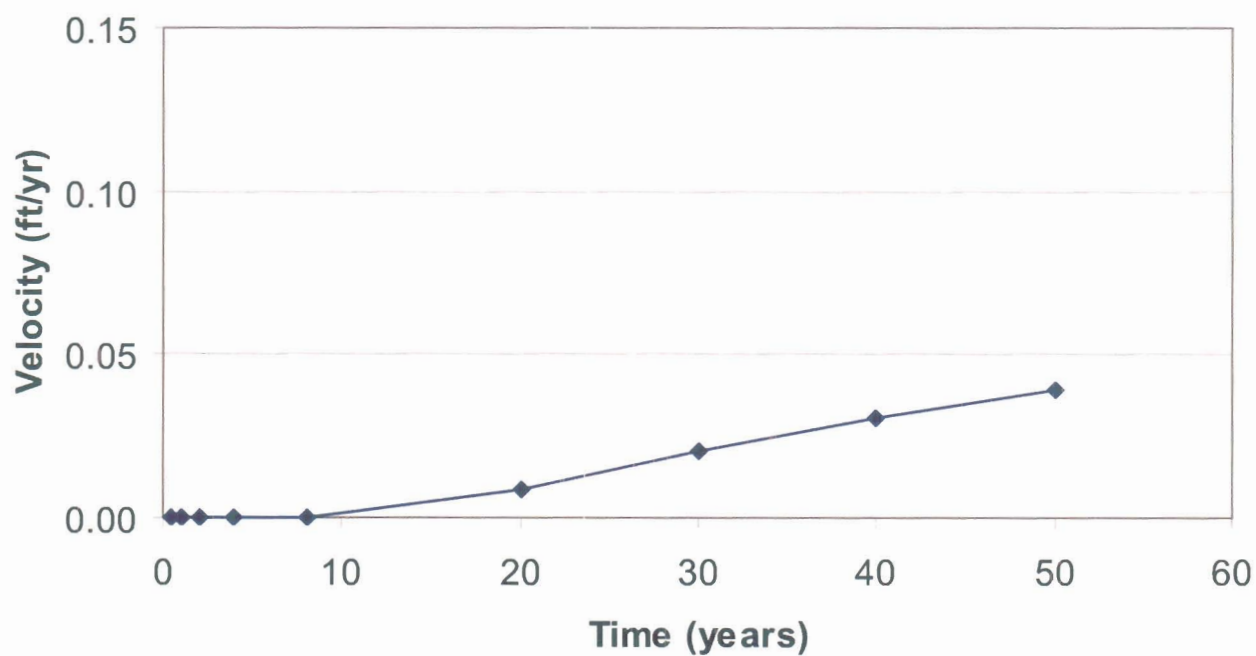
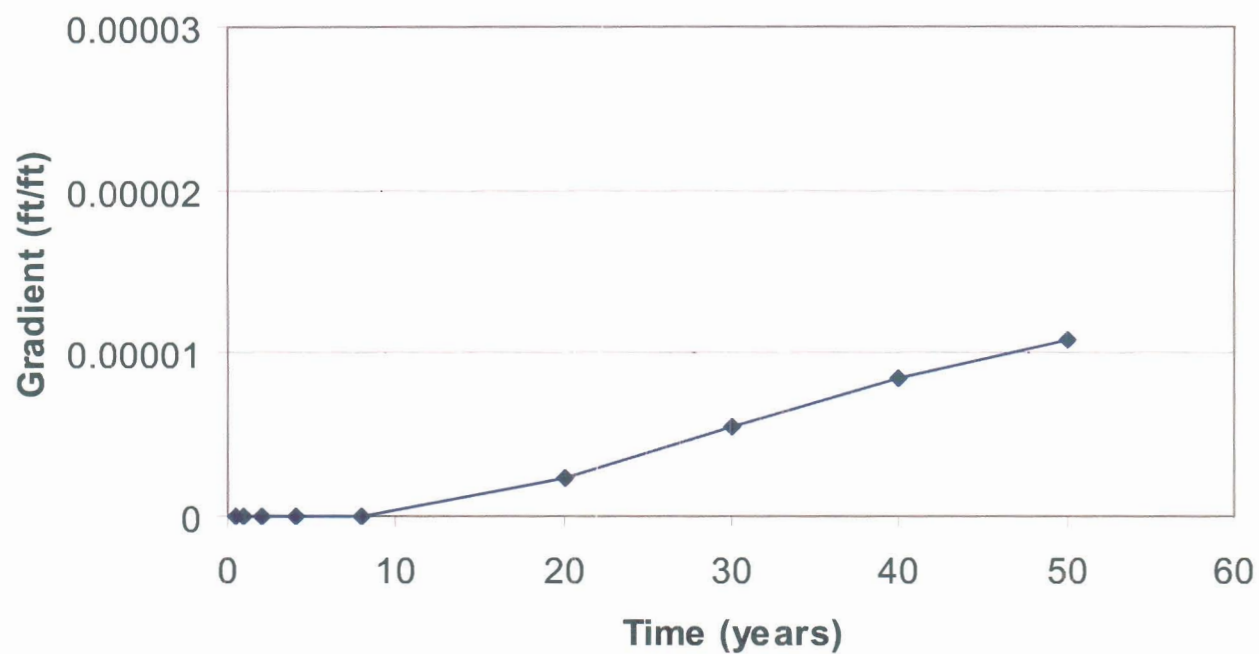
### **BACKGROUND**

Section 5.15.3.3.2 of the AFC states that each heliostat would have a raw water tank with a capacity of 250,000 gallons.

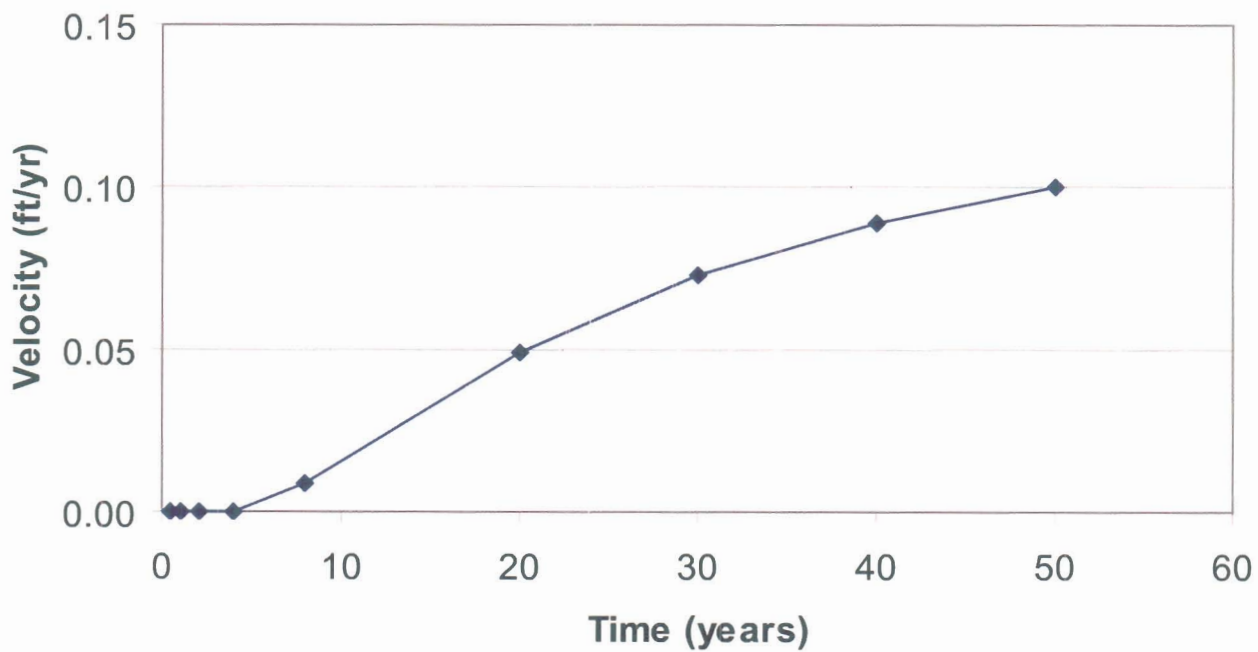
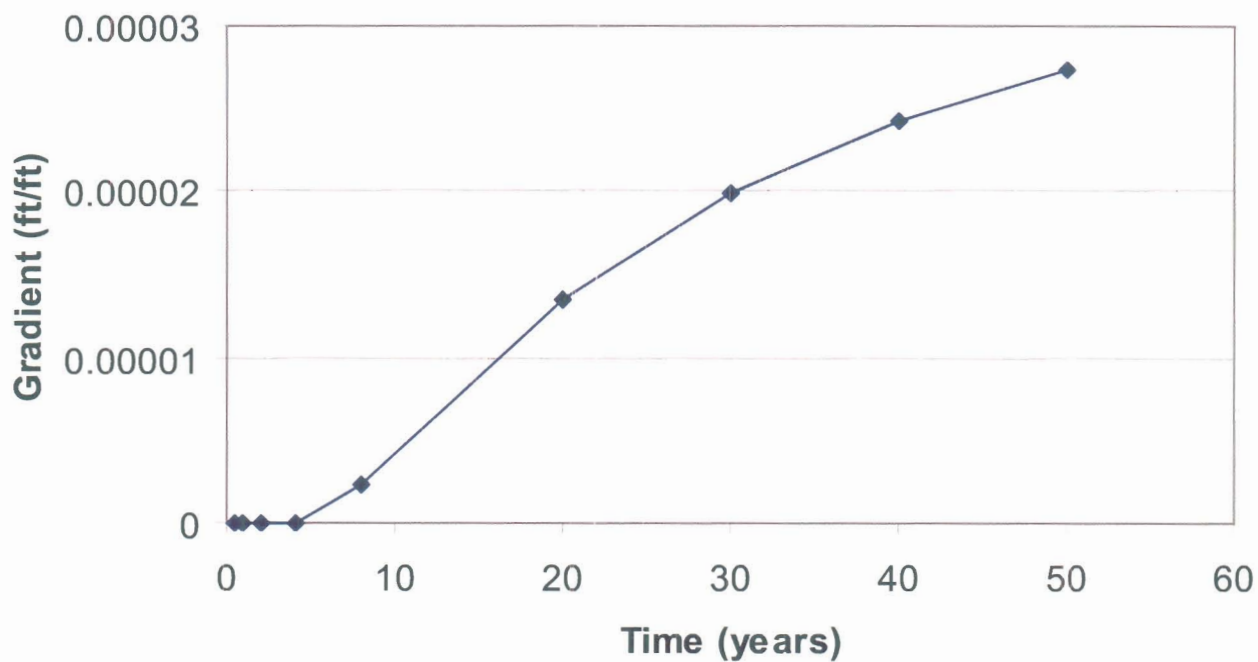
### **Data Request**

80. Please show the location of the proposed water tanks and distribution lines on a revised Figure 5.15-2 (Major Hydrologic Features In and Near the Project Site).

**Response:** The scale of AFC Figure 5.15-2 has been revised to allow the power block to be shown. Each phase is shown in a separate figure. Figure DR80-1a is Ivanpah 3, Figure DR80-1b is Ivanpah 2, and Figure DR80-1c is Ivanpah 1. The location of the water tanks is indicated on each figure.

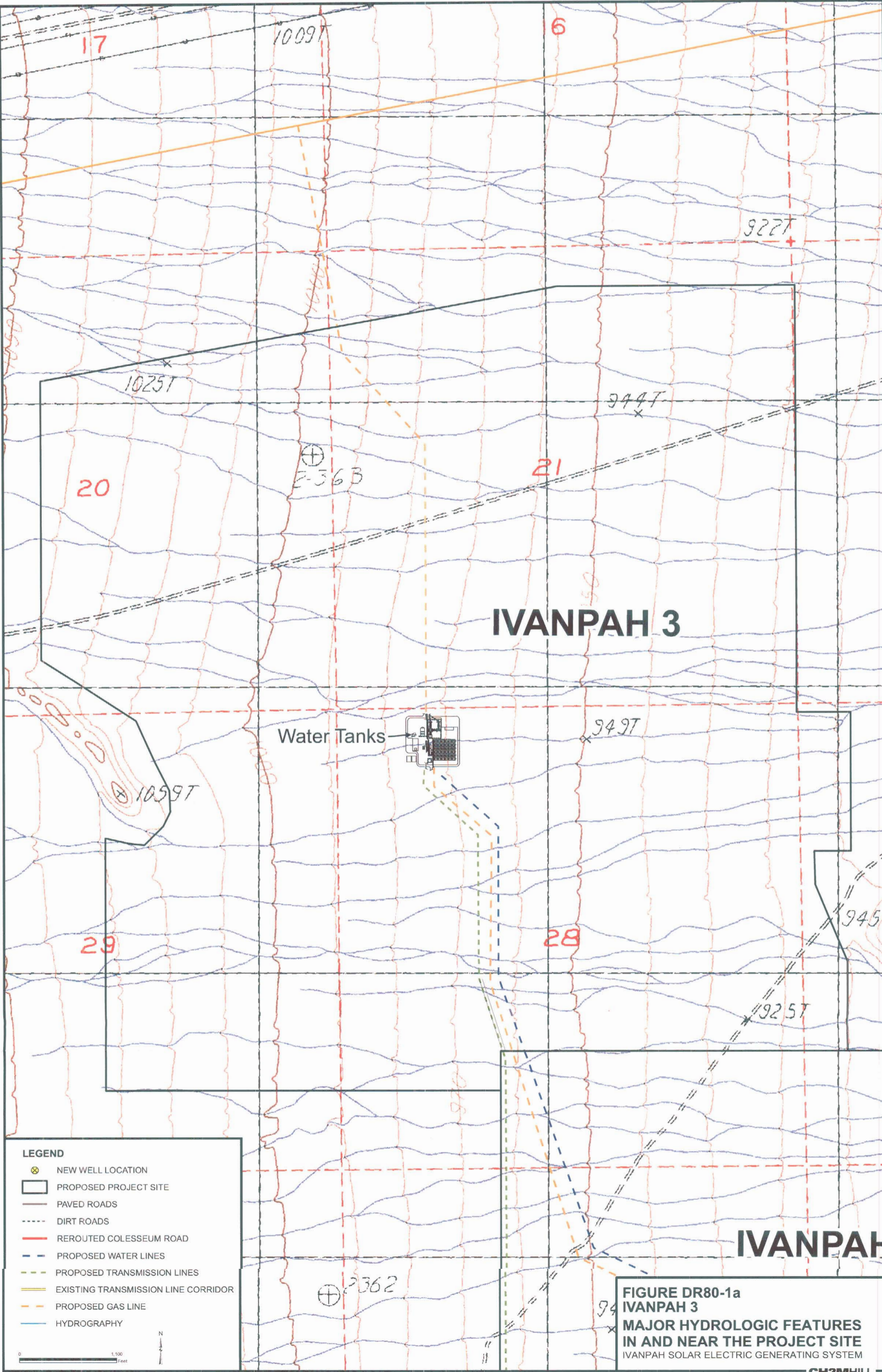


**FIGURE DR73-1**  
**INDUCED GROUNDWATER**  
**GRADIENT AND VELOCITY AT**  
**THE OLD MOLYCORP**  
**EVAPORATION PONDS**  
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

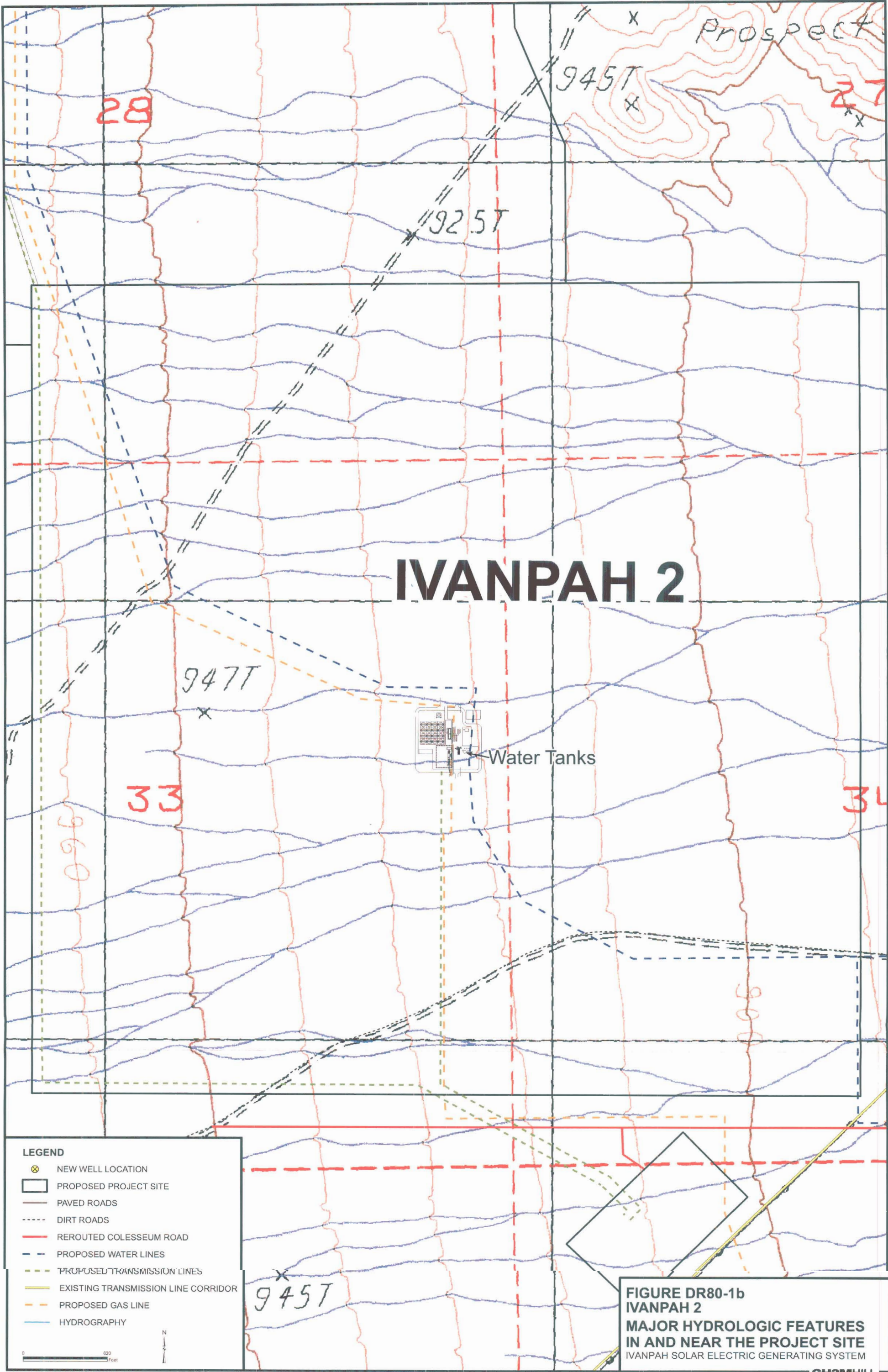


**FIGURE DR73-2**  
**INDUCED GROUNDWATER**  
**GRADIENT AND VELOCITY AT**  
**THE NEW MOLYCORP**  
**EVAPORATION PONDS**  
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

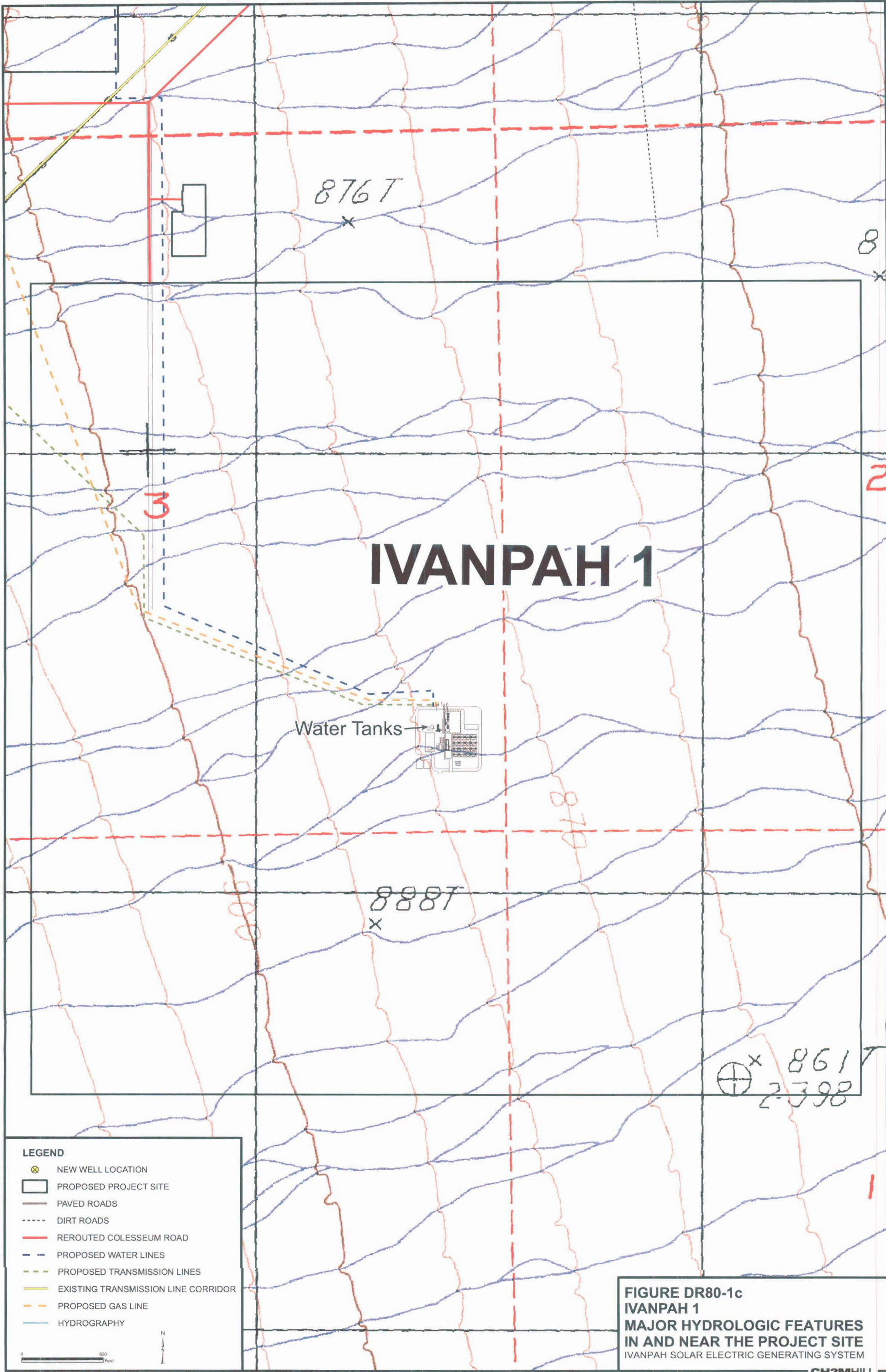












# Traffic and Transportation (81 – 90)

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## Background

Section 5.12.3.2 (Existing Traffic Conditions) of the AFC states that existing daily average and peak volumes on selected roadway segments in the vicinity of the project site were obtained from Caltrans and San Bernardino County traffic counts. Peak hour volumes presented in Figures 5.12-3 and 5.12-4 indicate that 26 trips would exit Primm Valley Golf Club in the AM peak hour and that 26 trips would enter the Primm Valley Golf Club in the PM peak hour; however, average daily traffic (ADT) is not presented in the AFC. The San Bernardino County traffic website cited in the AFC indicates an ADT volume of 249 trips for Yates Well Road but does not include peak hour data.

Page 5.12-6 indicates that northbound I-15 operates at Level of Service (LOS) F on Fridays; however, volume-to-capacity ratios for I-15 are not presented.

## Data Request

81. Please provide a source for the 26 peak hour trips included in the AFC or an explanation as to how that number was derived.

**Response:** Please note that in the AFC, the labels for Figure 5.12-3 and Figure 5.12-4 were reversed. The volumes shown on Figure 5.12-3 are the PM Peak Hour Intersection Traffic Volumes, and Figure 5.12-4 shows the AM Peak Hour Intersection Traffic Volumes. Corrected figures are provided as Figure 5.12-3R and 5.12-4R. They show the detailed assignments for the individual traffic for the off-ramp movements.

Golf course traffic volumes (26 vehicles/hour) were based on limited count data available at the Yates Wells Road ramp terminal intersection. Assumptions for the AM conditions were as follows based on a daily traffic count at the SB I-15/Yates Wells Road ramp terminal intersection. A traffic count by San Bernardino County (2006) was 249 vehicles/hour in both directions on Yates Well Road, or 125 vehicles per direction. It was assumed that 80 percent of traffic is inbound for the golf course during the 4-hour AM peak (100 vehicles), and 20 percent is outbound during the AM peak (25 vehicles). Applying a 75/25 percent directional split observed from Caltrans' data suggests that 75 vehicles are coming from Nevada, and 25 vehicles are coming from California (from: <http://traffic-counts.dot.ca.gov/districtbreakdown.htm>).

Then, it was assumed that the peak period traffic is spread over 4 hours (more detailed explanations can be found in Data Response 86.). With this assumption, 19 vehicles would come to the golf course from Nevada in the peak hour, and 7 vehicles would be coming from California in the peak hour (vehicles are rounded up). The total is 26 vehicles. All movements were reversed for the Existing PM conditions.

82. Provide the existing ADT for Primm Golf Club access road and Colosseum Road.

**Response:** As stated in Applicant's December 28, 2007 letter, the Applicant objects to this data request as burdensome. Without waiving this objection, Applicant provides the following response. The Applicant anticipates that existing traffic volumes on the golf course access road will be very similar to volumes on Yates Well Road, east of the I-15 interchange. San Bernardino County existing ADT for Yates Well Road was 249 vehicles/day (both directions). The Applicant does not believe that additional counts on the golf course access road would add any meaningful data. Further, as discussed at the January 4, 2008 Workshop, the Applicant is in the process of making contact with the Primm Valley Golf Club to see if it has any historical use data that may be helpful. If we obtain any useful data from the Golf Club, it will be provided.

83. Provide existing average and peak Saturday and Sunday trips for Primm Golf Club access road and Colosseum Road.

**Response:** As stated in Applicant's December 28, 2007 letter, the Applicant objects to this data request as burdensome. Without waiving this objection, Applicant provides the following response. These data are not available – no counts were made on weekends. Given that most construction activities will take place during the week, the value of these data is not clear. However, as stated in Data Response 82, we will contact the Golf Club to see if it has historic use data.

84. Provide peak hours traffic data for Yates Well Road.

**Response:** As stated in Applicant's December 28, 2007 letter, the Applicant objects to this data request as burdensome. Without waiving this objection, Applicant provides the following response. However, as stated in Data Response 82, we will contact the Golf Club to see if it has historic use data.

85. Please provide volume-to-capacity ratios for southbound and northbound I-15.

**Response:** Caltrans' 2006 counts are used as the source for this data response. They can be found at: <http://traffic-counts.dot.ca.gov/2006all/r012-15i.htm>; the data are shown below:

Route	County	Post-mile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
15	SBD	181.390	Yates Well Road Interchange	5300	47000	40000	5300	47000	40000

Daily v/c ratios are calculated in the table below, on I-15 at the Yates Wells Road Interchange. To calculate v/c ratios, the effects of trucks were also considered. From Caltrans' 2005 Truck Counts, about 18% of the traffic is truck traffic near Nipton Road (<http://traffic-counts.dot.ca.gov/>). The same percentage can be applied to Yates Well Road. Using these data, a passenger car equivalent (PCE) factor of 2.5 was used for the calculation.

	Average Daily Traffic Volume	Daily Capacity (18,000 veh/lane)	Number of Trucks	Number of Trucks with PCE=2.5	Daily Cars	Daily Demand (PCE)	Daily V/C
Existing Conditions	47,000	72,000	8,460	21,150	38,540	59,690	0.83
With construction traffic (242 vehicles with 5% heavy vehicles, i.e. 230 vehicles and 12 trucks)	47,230	72,000	8,472	21,180	38,758	59,938	0.83

Note that the hourly v/c ratio varies throughout the day, and is different on Fridays.

### Background

The assumptions on page 5.12-10 indicate the AM and PM peak hours for Primm Valley Golf Club traffic were assumed to be four hours each but does not indicate the times assumed.

### Data Request

86. Please provide the assumed start and end times of the AM and PM peak hours for Primm Valley Golf Club traffic.

**Response:** No field data were used to determine the peak hours at the golf course. Because of the nature of this activity, it was been conservatively assumed that peak hours for arriving golfers would occur between 7:00 AM and 11:00 AM. Similarly, golfers were assumed to leave between 3:00 PM and 7:00 PM. These hours would be somewhat different depending on the time of year. However, we will contact the Golf Club to see if they have this data.

### Background

Page 5.12-19 of the AFC indicates that project construction traffic will result in a significant impact on Friday afternoons on northbound I-15, and suggests the applicant require the construction contractor to implement measures to minimize travel on this roadway at that time. These measures include: providing special or additional incentive

to construction workers to use the shuttle buses (or carpool) on Fridays; communicating to workers the benefits of using the buses (including travel time savings); and identifying any limitations to the buses.

Preliminary coordination with Caltrans indicates that the measures suggested in the AFC are not likely to be effective. While these measures provide an opportunity to reduce the amount of project related traffic on this roadway, their effectiveness relies on the personal preference of construction workers. Thus, these measures do not ensure that the project's contribution to this significant impact is minimized.



## **Data Request**

87. Please discuss the feasibility of alternative construction schedules for the project that would avoid impacting the northbound I-15, Friday afternoon commute.

**Response:** See Data Response 88.

88. Please provide fully enforceable mitigation measures that would eliminate or minimize the project's contribution to congestion on northbound I-15 on Friday afternoons.

**Response:** Friday afternoons are the most critical period for traffic impacts. Reducing or managing the number of construction workers leaving the site at one time will have benefits for traffic flow. The following are mitigation measures that may be appropriate for mitigating any potential impacts.

- Shift times could be adjusted on Fridays, depending on the season. Especially during the summer hours, very early shifts (say 5:00 AM to 1:30 PM) would reduce the impacts. Early shifts may require the addition of extra lighting on the site.
- Regardless of the specific schedule on Friday, staggering shifts (as reported in the draft AFC), should be implemented. A specific suggestion would be to require workers to leave the site in limited numbers over a 2- or 3-hour period (instead of all at once) on Friday afternoons.

## **Background**

According to the AFC, the project would be located in close proximity to the proposed Ivanpah Valley Airport in Ivanpah Valley, Nevada, and may also be on or near flight paths of the Jean Airport and possibly McCarran Airport in Las Vegas. All of the photographs of mirror arrays in Appendix 5.13A of Similar Solar Projects, which depict aerial views of mirror arrays, suggest a potentially high incidence of reflected glare that would affect aviation activity and safety.

Similarly, the mirror arrays would be close to the I-15 freeway and appear to have potential for reflecting glare toward freeway traffic.

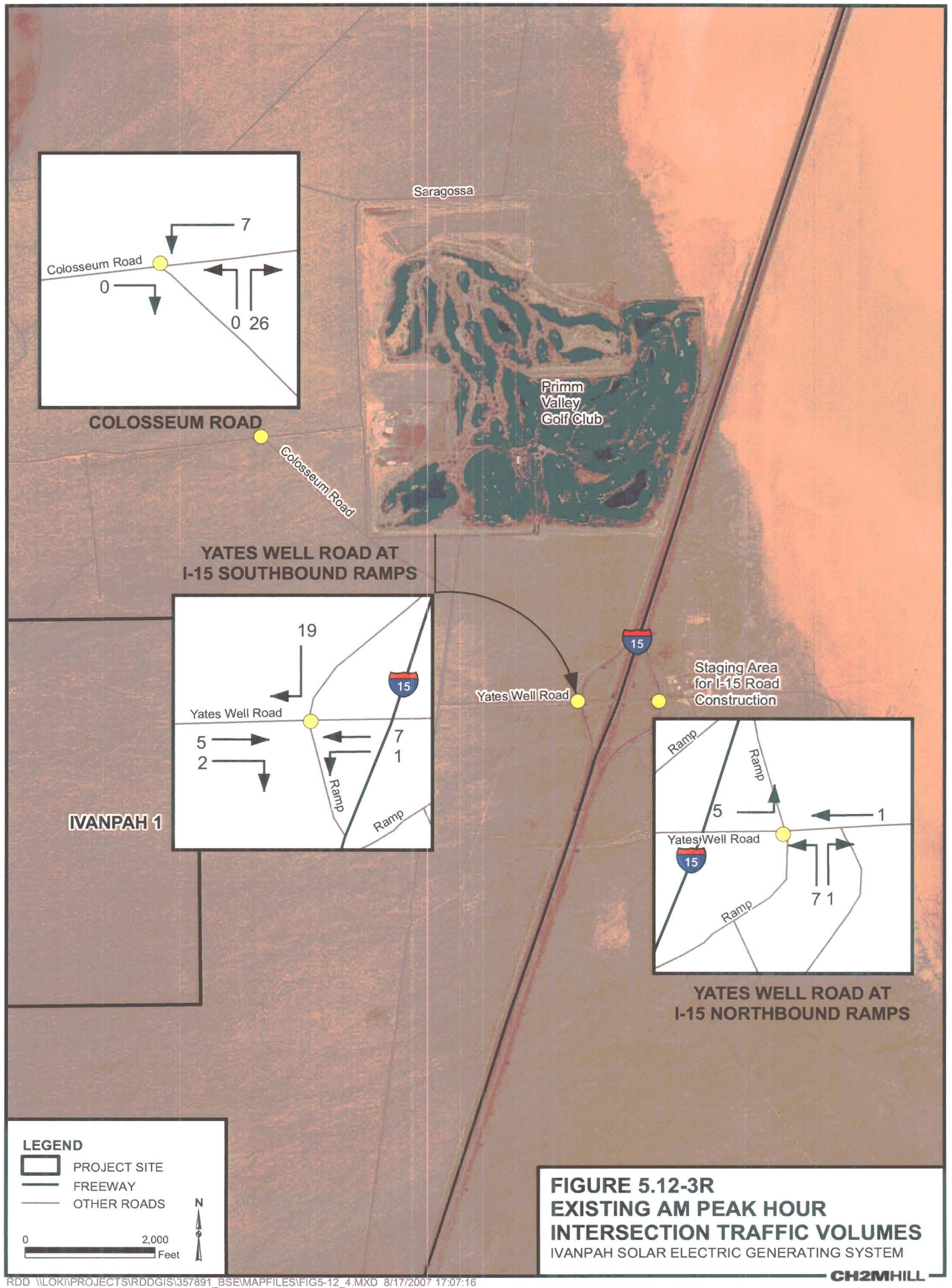
## **Data Request**

89. Please discuss the potential of the project to produce glare that could impair air navigation to and from each of the airports possibly affected, and if appropriate, any measures necessary to avoid it.

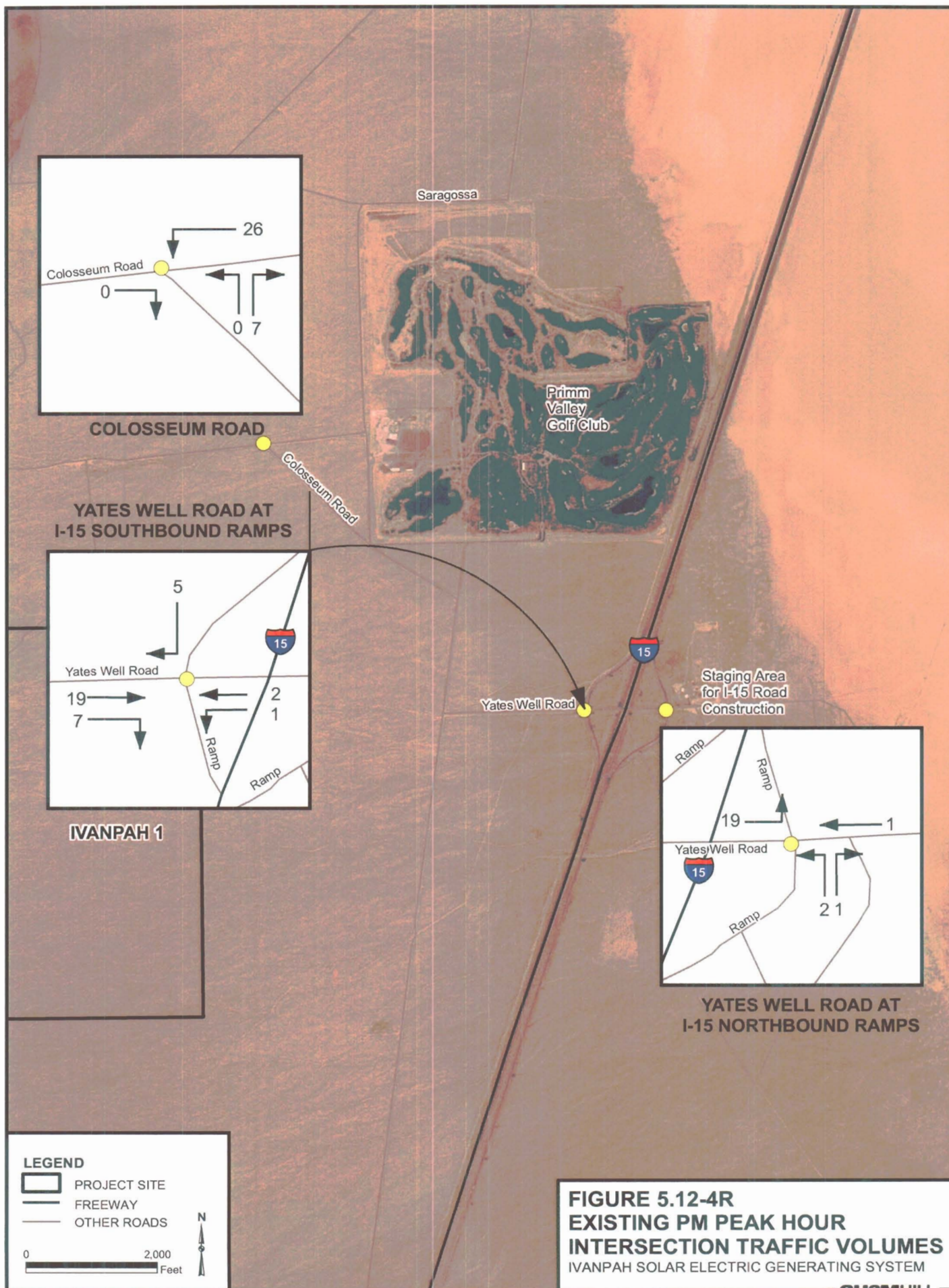
**Response:** According to beam safe intensity calculations performed as part of the basis of design for the heliostat fields, the likelihood of random heliostat beam hazard to aircrafts flying in the area is infinitesimally remote. See Appendix A of Attachment DR89-1, Beam Safety Design Parameters.

90. Provide a discussion on the potential of the project to produce glare that could impair vehicle traffic on I-15, and if appropriate any measures necessary to avoid it.

**Response:** The glare sources for traffic on I-15 are the solar receivers installed on the top of the power towers. In every day terms, looking at the receiver from the nearest site boundary is similar to viewing a 100-watt light bulb from a distance of 18 feet (5.5 meters). For people passing on I-15 the radiance from the receiver will not be significant, because I-15's closest approach to the field boundaries is about 0.9 mile from the closest solar field fence and more than 1.2 miles from the closest tower. The resulting potential exposure to motorists is about 5,500 times less than Maximum Permissible Exposure (MPE) for continuous exposure – about like viewing a 100-watt light bulb from a distance of over 130 feet. See Attachment DR90-1, Radiant Flux From Solar Receiver on Distributed Power Towers, and Attachment DR90-2, Receiver Glare Safety Calculations. In addition, as described in Data Response 103, design controls will be used to restrict movement of the heliostats so that the mirrors do not reflect sunlight toward vehicles on I-15.









ATTACHMENT DR89-1

## **Beam Safety Design Parameters**

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## ATTACHMENT DR89-1

REVISIONS				
LTR	DESCRIPTION	BY	DATE	APPR.
A	INITIAL RELEASE FOR COMMENTS	DF	17/1/07	
B		DF	21/1/07	
C	APPENDIX ADDED	DF	22Jan 07	
D	UP-DATED	AA	27Dec 07	

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**PROJECT**

01-DPT550

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# 1. SCOPE

This document lists the basic system operating modes and procedures for starting up, focusing, de-focusing, and stowing the heliostat field of a LUZ II DPT-550 Central Tower Plant, while ensuring beam safety in and above the project site. It shall serve as the top-level specification for conceptual and detail design of solar field control algorithms, systems and software.

Procedures and beam safety statistical calculations assume a solar field consisting of 70,000 heliostats, each having a reflecting surface of 7.3 square meters, placed on a field covering 830 acres. Safety measures reflect principles and procedures developed for beam safety in the Solar 1 experimental plant at Daggett, California, with appropriate changes (see Sandia Report SAND83-8035, by T. D. Brumleve).

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	SHEET	3	OF	9	REV	D	

## 2. STATES AND TRANSITION

There are five main states for the solar field:

- Stow (long term hold / overnight hold / cleaning & maintenance) - The heliostats have been rotated down into the stow position, with the mirror surface  $5^\circ$  past vertical (i.e., inclined slightly toward the ground). There is no beam concentration in the stow position.
- Standby - The heliostats are focused on the standby aim points on the side of the tower or a ring at the height of the tower (70m, 230ft). In this state all beams diverge beyond the focal points or ring, and there is no concentration of beam energy outside of the plant boundaries.
- Normal Operation - All heliostats are focused on the receiver, except for heliostats in standby, stow or calibration position (beam directed to the tower structure as required for the Beam Characterization System). Heliostat beams again diverge after passing the tower, with no concentration outside of the plant boundaries.
- Wind Protection Stow – All heliostats are in a “face up” stow position, with free (random) azimuth and the mirror plane elevated not more than  $5^\circ$  from horizontal. With random azimuth orientations, no intensity concentration of more than 4 suns ( $4 \text{ kW/m}^2$ ) may converge outside of the plant boundaries. [see appendix A].
- Transition Mode – All heliostats are following a path defined for the transition that don't concentrate a beam intensity of more than 4 suns ( $4 \text{ kW/m}^2$ ) over 730ft (220m) in altitude (230ft tower height plus 500ft FAA rules prohibiting flight within 500 ft. of any man made obstruction).

In addition to the five principal operating modes there are the following sub-modes:

- Off-line: the heliostat does not respond to commands from the Heliostats Array Controller (HAC), a manual command is required to return to active status. The heliostat may be down for maintenance or repair.
- Track: the heliostats are tracking the designated receiver aim points.

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TITLE: 100 MW SYSTEM BEAM SAFETY DESIGN PARAMETERS						
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	FILE NAME					
	SHEET	4	OF	9	REV	D

- Beam Characterization: An individual heliostat is tracking the beam characterization system target located within the plant boundaries.
- Directed Position: A heliostat has been moved to a given position for maintenance or testing. Software interlocks ensure that no beam concentration over the safety limit will occur
- Mark: The heliostat is positioned for calibrating the position signals from the azimuth and elevation motor encoders. Software interlocks ensure that multiple beams are not concentrated at working elevations inside or outside plant boundaries.

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### 3. BEAM SAFETY DURING TRANSITIONS

Beam Safety During Transitions: HAC will move groups of heliostats from the normal stow position or high wind protection stow position to a standby tracking point along imaginary lines or ring, to prevent concentrating the image from more than 4 suns ( $4\text{kW/m}^2$ ) outside the plant boundaries on ground level or sky line (220m, 730ft). The process is reversed from the standby tracking point to either stow position. These paths are site dependent, and will vary by season.

Single heliostat transition will be performed by a direct command from the HAC or Heliostat controller (HC), to a pre-designated target and path that will ensure no constriction of energy over the set limit

Emergency beam removal: The Master Control System (MCS) will issue a transition command to all operating heliostats to move to standby aiming points, while all heliostats in stow position remain in stow.

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## 4. REFERENCE

1. T. D. Brumleve "10 MWe Solar Thermal Central Receiver Pilot Plant: Beam Safety Tests and Analyses", SAND83-8035, 1984.
2. T. D. Brumleve & j. c. Gibson, "Measurement Challenges in Solar Central Reviver System Test Facility", 7<sup>th</sup> Energy Technology Conference, 1980.
3. T. D. Brumleve, "Eye Hazard and Glint Evaluation for the 5 MW Solar Central Thermal Test Facility", Sandia National Laboratories, SAND-8022, 1977.

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## 5. APPENDIX A - Calculations of Beam Intensity and Safety

A reference for this calculation is from the "10 MWe Solar Thermal Central Receiver Pilot Plant: Beam Safety Tests and Analyses, pp. 26-31: SAND83-8035"

The maximum safe intensity of one heliostat:

$$I_s = \frac{\pi}{4} \frac{E_r I_{smp}}{kI} \frac{\beta^2}{\rho} = \frac{\pi}{4} \frac{8.5 * 0.243}{0.00525 * 0.1} \frac{\beta^2}{\rho} = 3090 \frac{\beta^2}{\rho} = 3090 \frac{0.0118^2}{0.94} = 0.457 \frac{w}{cm^2} = 4.57 \frac{kw}{m^2}$$

Comparing to Solar One, for which  $I_s = 0.49 w/cm^2$ , we have lower intensity.

We are using a more conservative safe intensity that is equivalent to 4 suns ( $4 \times 1 \text{ kW/m}^2$ ).

Where:

$E_r$  – retinal irradiance.

$d_r$  – diameter of the retinal image in meters.

$$k = \frac{\pi v \tau d_p^2}{4 f^2} \left[ \frac{W \cdot m}{cm^2} \right] - \text{Physical property of the human eye (ref 3 pg.21)}$$

$L$  – Radiance.

$I$  – Intensity.

$\beta$  – Total divergence angle from the heliostat.

$\rho$  – Reflectivity of the mirror.

$I_s$  – safe intensity.

$d_{rs}$  – maximum safe image diameter.

$E_{rs}$  – Safe retinal irradiance,  $E_{rs} = \frac{0.002}{d_{rs}}$ , (ref 2).

$( )_{mp}$  – Human property.

### Beam concentration:

At a distance of 500m, which is the heliostat's focal distance, the beam area is:

$$0.7 + 2.5 \text{ rad} * 500 \text{ m} = 1.95 \text{ m}$$

$$2.5 \text{ rad} * 500 \text{ m} = 1.25 \text{ m}$$

$$\rightarrow 1.95 \text{ m} * 1.25 \text{ m} = 2.4 \text{ m}^2$$

The total radiation from the single heliostat is  $\frac{7.5 \text{ kw}}{2.4 \text{ m}^2} = 3.125 \text{ kw/m}^2$

This is the highest intensity from a heliostat, less than the  $I_s$  of  $4.5\text{kw/m}^2$  (equivalent to four suns).

To check a random beam hazard to low-flying aircraft, we will consider the conditions required to create a hazard to aircraft pilots and the probability of their occurrence. At an elevation of 1000m above the ground the radiance of a single heliostat is less than one sun ( $1\text{kw/m}^2$ ), and is therefore not hazardous to aircraft pilots. The probability of two heliostat beams crossing in the same place in the sky dome at an altitude of 1000m is calculated as follows. The dome surface (S) of one heliostat at 1000m altitude is  $30,000\text{ m}^2$  based on  $\pm 5^\circ$  of freedom. The probability of a spot of  $14\text{m}^2$

$$\{ S = (3.25\text{m} + 0.00125\text{rad} * 1000\text{m})(2.25\text{m} + 0.00125\text{rad} * 1000\text{m}) = 14\text{m}^2 \}$$

intersecting with another  $14\text{m}^2$  on a  $30,000\text{ m}^2$  dome

$$\text{is } p_h = \frac{14\text{m}^2}{(H[\text{m}] * 0.174\text{rad})^2}; P_{2/1000} \approx 4.6 * 10^{-4} \approx \frac{1}{2200}.$$

As the altitude (H) increases the probability of a conjunction decreases and the irradiance of each heliostat is reduced significantly.

The probability of any two random heliostat beams crossing in the sky is given by:

$$P = \frac{P_{n/h} \left( \frac{\text{number of heliostats in the field}}{\text{number of heliostat crossing}} \right)}{(\text{number of heliostats})^2} \approx \frac{0.000467 \binom{70,000}{2}}{70,000^2} \approx 0.00023 \approx \frac{1}{4300}$$

At 1000m the beam spot is  $14\text{m}^2$  and  $E = 0.53\text{kw/m}^2$ , 2 spots have  $E = 1.07\text{kw/m}^2$ .

To reach an intensity of  $4.5\text{kw/m}^2$  would require a conjunction of eight heliostat beams. The probability for eight beams to cross in a 1000m altitude is calculated as follows:

$$\frac{\left( \frac{1}{2500} \right)^7 \binom{70,000}{8}}{70,000^2} \approx 1.08 \times 10^{-28}$$

The likelihood of a random heliostat beam hazard to aircraft pilots is therefore infinitesimally remote, before even considering beam attenuation losses (approximately 5% every 500 meters), beam scattering caused by mirror vibration, and the duration of exposure required to constitute a real hazard..

ATTACHMENT DR90-1

## **Radiant Flux from Solar Receiver on Distributed Power Towers**

---

## ATTACHMENT DR90-1

### Internal Memo

**To:** Yoel Gilon, Arie Amit  
**From:** Danny Franck  
**CC:**  
**Date:** December 13, 2007  
**Re:** Radiant Flux From Solar Receiver On Distributed Power Towers

This document discusses the intensity and some effects of energy emitted from solar receivers mounted on our distributed power towers, such as those planned for the Ivanpah project. The calculation of the radiant flux from the receiver is based on assumptions and calculations included in Sandia document SAND83-8035 – "10MWe Solar Thermal Central Receiver Pilot Plant: Beam Safety Tests and Analysis", T.D. Burmleive, pp.28-31,72, 76, 80.

The conclusion is that the retinal irradiance  $E_r$  impinging on a human eye from the receiver is several scales smaller than the one from the sun (see Table 1. below, and accompanying calculations), and the radiation intensity (I) from the receiver at the nearest project fence line (300m from the receiver) is 14 times less than the Maximum Permissible Exposure (MPE') for continuous viewing. **In every day terms, looking at the receiver from the nearest site boundary is like viewing a 100W light bulb from a distance of 5.5m (18ft).**

**For people passing on highway I-15 the radiance from the receiver will not be significant, as I-15's closest approach to the field boundaries is about one mile from the closest solar field and almost two kilometers from the closest tower. The resulting potential exposure to motorists is about 5500 times less than Maximum Permissible Exposure (MPE) for continuous exposure – about like viewing a 100W light bulb from a distance of over 130 ft.**


The following is a more detailed discussion and calculations supporting the general conclusions summarized above. The maximum safe exposure (MPE) which can be tolerated by the human eye is defined as:

MPE for a momentary exposure (0.15s) is  $1.0\text{W}/\text{cm}^2 = 10,000\text{W}/\text{m}^2$ .

MPE for continuous exposure is  $0.1\text{W}/\text{cm}^2 = 1000\text{W}/\text{m}^2$ .

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**Title: Receiver Glare Safety**

 A BrightSource Energy Company	Kiryat Mada 11 - Amot Bldg #6 P.O. Box 45220 Har Hotzvim Jerusalem 91450 Israel Ph: +972 (0)77-202-5000 Fax: +972 (0)2 571-1059	PROJECT	00 Non-Project Specific				
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The  $E_r$  from the sun's radiance on the retina is  $85,000\text{W/m}^2$ .

We calculate the retinal irradiance from the receiver as follows:

$$I = \frac{D^2 \cdot \Phi \cdot \rho}{2\pi R^2} = \text{Intensity of the light reflected from the receiver at distance R.}$$

$E_r = k \cdot I$  = Retinal irradiance, where  $k$  = human eye factor =  $52.5\text{W/m}^2$

I used only half sphere that the light can be reflected to ( $2\pi R^2$ ).

$E_r$  - Retinal irradiance [ $\text{W/m}^2$ ]

$D$  - Receiver diameter [m]

$I$  - intensity [ $\text{W/m}^2$ ]

$R$  - Distance from the receiver [m]

$\Phi$  - Flux on the receiver [ $\text{W/m}^2$ ].

$\rho$  - Reflectivity [%]

$k$  - human eye factor,  $k = 52.5\text{W/m}^2$ .

$E_r$  was calculated using the following assumptions:

$\Phi = 600\text{kW/m}^2$

$D = 12\text{m}$ ,

$\rho = 5\%$ ,

$R = 100 - 1000\text{m}$ .


The real total flux from the receiver is significantly lower than  $600\text{kW/m}^2$ . Table 1 below presents the resulting irradiance at various distances  $R$  from the receiver.

**Table 1. Flux On Retina From Receiver**

Distance [m]	I [ $\text{W/m}^2$ ]	$E_r$ [ $\text{W/m}^2$ ]
100	68.75	3610
160	25.25	1410
200	17.19	902
300	7.64	401
400	4.30	226
500	2.75	144
600	1.91	100
700	1.40	74
800	1.07	56
900	0.85	45
1000	0.69	36

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The flux from the receiver at 160m has the same effect as a 100W bulb at a distance of 3m (10ft); the flux from the receiver at the Ivanpah project boundaries is equal to that of the light bulb at a distance of 5.5m (assuming 100% emissivity of the light bulb).

For comparison purposes, Table 2 below presents the irradiance on a retina from a 100W light bulb at various distances.

**Table 2. Flux On Retina From 100W Light Bulb**

distance [m]	I [W/m <sup>2</sup> ]	Er [W/m <sup>2</sup> ]
3	28.1	1447.6
5	8.4	439.6
10	2.5	139.8

(This document's detailed calculations are in "Attachment DR90-2".)

The calculation of the Er from a light bulb:

$$I = \frac{P}{4\pi R^2} \cdot \rho$$

$$Er = k \cdot I$$

Er - Retinal irradiance

D - Bulb diameter

I - intensity

R - Distance from the bulb


P - Bulb power

ρ - Reflectivity

k - human eye factor, k = 52.5W/m<sup>2</sup>.

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ATTACHMENT DR90-2

## **Receiver Glare Safety Calculations**

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# ATTACHMENT DR90-2

## Receiver Glare Safety Calculations

### Receiver Extreme

#### INPUTS:

Flux on receiver [kW/m <sup>2</sup> ]	600
reflectivity [%]	5.00%
Receiver Diameter [m]	12
source radiance [w/m <sup>2</sup> *sr]	30
k [w/m <sup>2</sup> ]	52.5

#### RESULTS:

distance [m]	I [W/m <sup>2</sup> ]	solid angle	L (of the source)	Er
100	68.75	0.018334649	260417	3609.63
160	26.86	0.007161972	666667	1410.01
200	17.19	0.004583662	1041667	902.41
300	7.64	0.002037183	2343750	401.07
400	4.30	0.001145916	125000	225.60
500	2.75	0.000733386	156250	144.39
600	1.91	0.000509296	187500	100.27
700	1.40	0.000374177	218750	73.67
800	1.07	0.000286479	250000	56.40
900	0.85	0.000226354	281250	44.56
1000	0.69	0.000183346	312500	36.10
2000	0.17	4.58366E-05	625000	9.02

### Bulb

#### INPUTS:

Bulb Power [W]	100
reflectivity [%]	100.00%
Bulb Diameter [m]	0.1
source radiance [w/m <sup>2</sup> *sr]	100
k [w/m <sup>2</sup> ]	52.5
bulb surface area	3.14E-02

#### RESULTS:

distance [m]	I [W/m <sup>2</sup> ]	Er
3	28.1	1477.60
5	10.1	531.94
5.5	8.4	439.62
10	2.5	132.98
40	0.16	8.31



# Transmission System Engineering (91 – 96)

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## Background

Staff needs to determine the system reliability impacts of the project interconnection and to identify the interconnection facilities including downstream facilities needed to support a reliable interconnection of the proposed Ivanpah Solar Electric Generating System (I SEGS). Staff requires a detailed description of the ISEGS 115 kV switchyard and interconnection facilities between generators and 115kV switchyard including major equipment and their ratings for completion of its analysis..

## Data Request

91. Please provide a complete electrical one-line diagram (or resubmit Document No. 01-PB-E-D-201 Rev. A and Document No. 07-PB-E-D-201 Rev. A) of the ISEGS 115 kV switchyard. Show all equipment for the generators' interconnection with the switchyard including any bus duct connectors or cables, 13.8kV breakers on the low side, generator step-up transformers, short overhead line or conductors with its configuration, buses, breakers, disconnect switches on the 115kV side and their respective ratings.

**Response:** Document No. 07-PB-E-D-201 has been revised (Rev. B) and replaces the figure provided in Supplement A. It is attached as Figure TSE-1aR. Document No. 01-PB-E-D-201 has been revised (Rev. B) and replaces the figure provided in Supplement A. It is attached as Figure TSE-1bR.

92. Resubmit Figure TSE-2 with the ratings of the breakers; disconnect switches and other equipments of the proposed SCE 230kV switchyard.

**Response:** Figure TSE-2 (submitted in Supplement A) has been revised and is provided as Figure TSE-2R.

## Background

Staff requires the System Impact Study (SIS) and/or Facilities Study (FS) to identify potential downstream transmission facilities that may be required due to interconnection of the ISEGS to the California Independent System Operation (California ISO) grid and to determine if the interconnection would comply with the NERC/WSCC, and/or Utility planning standards and reliability criteria.

## Data Request

93. Please submit a complete SIS report prepared by Southern California Edison (SCE) and/or California ISO for interconnection of the 400 MW ISEGS based on 2010 summer peak and off peak system conditions (scheduled on-line date of the ISEGS).

- a. The study should include a power flow, short circuit and transient stability analyses with a mitigation plan for any identified reliability criteria violations. In the report, list all major assumptions in the base cases including major path flows, major generations including queue generation and loads in the area systems.
- b. Identify the reliability and planning criteria utilized to determine the reliability criteria violations.

**Response:** Five copies of the System Impact Study (SIS) for Ivanpah 2 (Attachment DR93-1) – the first phase of the ISEGS project (ISO Queue Position #131) – are being provided to CEC Staff. (Electronic copies of Attachment DR93-1 will be provided to the other parties upon request.) The next two SIS reports will be provided once they are delivered by the CAISO to the Applicant. Per recent communications, the CAISO has completed the majority of the work on the second SIS but declined to provide an expected delivery date.

The submitted SIS was performed using 2013 heavy summer and 2013 light spring base cases. The first phase of this project is planned to be on-line sometime in 2010 and the last phase of the ISEGS project is planned to be on-line by the first quarter of 2012. SCE policy is to perform an SIS using a study year that would allow the inclusion of all senior queue position generation (generation ahead of a particular project in the queue). This policy allows for the study to accurately determine the ultimate system reinforcements required for each proposed new generation project. There are senior queue position generators with on-line dates of 2013 in the area of the ISEGS project (e.g., ISO Queue Position 110). Therefore, by SCE policy, the SIS for the first phase of ISEGS was performed using 2013 base cases.

All the information requested in Data Requests 93.a. and 93.b. is included in this SIS for the first phase of the ISEGS project.

94. Provide power flow diagrams with and without the ISEGS for base cases. Power flow diagrams should also be provided for all overloads or voltage criteria violations under normal system (N-0) or contingency (N-1 & N-2) conditions

**Response:** The requested power flow diagrams are provided in Appendix A of the SIS. Please note that only plots for normal conditions are included in the appendix since the two single contingencies that might cause thermal overloads would not solve due to the high line loading. (If not mitigated, these contingencies could cause a voltage collapse to occur on the local 115 kV transmission line to Coolwater.) In order to fully meet applicable NERC/WECC and ISO planning standards, an SPS will be implemented to prevent unit instability and/or voltage collapse from occurring for these two contingencies.

95. Provide electronic copies of \*.sav, \*.drw, \*.dyd and \*.swt GE PSLF files and EPCL contingency files in a CD (if available).

**Response:** These files have been requested from the CAISO and SCE, and Applicant has been informed that both Applicant and the CEC will need to execute a project-

specific Non Disclosure Agreement (NDA) to receive these files. SCE's contract manager expects to provide the NDA shortly, and Applicant will forward the document to the CEC for signature under separate cover.

96. Provide the expected date, after contacting the California ISO, when the final interconnection approval letter from the California ISO would be issued

**Response:** Applicant has been informed by J.D. Pratt of the CAISO that approval letters used to be issued by the CAISO Engineering Department upon completion of the SIS and Interconnection Facilities Study, but now the Large Generator Interconnection Agreement (LGIA) takes the place of this letter. The Interconnection Facilities Studies for all three projects are expected to be completed between July and September 2008. The LGIAs could require an additional 60 to 90 days.

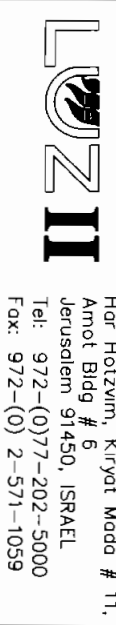
NOTES:  
1. MOTOR LOADS SHOWN ARE UNITS OF HORSEPOWER UNLESS OTHERWISE NOTED  
2. STATIC LOADS ARE SHOWN IN UNITS OF KV



1

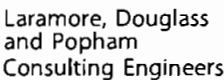
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# Visual Resources (97 – 110)

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## Background

The AFC presents two visual simulations of the project from Key Observation Points (KOPs) selected in discussion with staff at the Energy Commission prior to filing the AFC. We were unable to accompany applicant's staff in the initial field visit at that time due to intensive workload and scheduling conflicts. However, with further study of the project it has become apparent that additional analysis of potential impacts to viewers on Interstate 15 (I-15) is necessary. According to the California Environmental Quality Act (CEQA) Guidelines, a project may cause a significant visual impact if it would substantially degrade the existing visual character or quality of the site and its surroundings. Viewer exposure and visual quality are key factors in staff's methodology for assessing visual impacts. I-15 represents the primary entry to the city of Las Vegas. According to the AFC, viewer exposure may exceed 40,000 motorists per day, including a high proportion of tourists. In addition, the existing visual setting appears to be scenically intact. Because the nearest portions of Ivanpah 1 would fall within near-middleground distances of under one mile, it would be appropriate to include a representation of the project from I-15, and discuss the feasibility and appropriateness of considering moving Ivanpah 1 further west to reduce potential visual effects to motorists on I-15.

## Data Request

97. Please provide a full-page, color simulation of the proposed project (at life-size scale when the picture is held 10 inches from the viewer's eyes) from a viewpoint on I-15 at near middleground distance of roughly 1 mile or less, along with corresponding location and camera lens information.

**Response:** AFC Figure 5.13-1 has been revised and is attached as Figure 5.13-1R. It has been revised to show the location of KOPs 3 and 4 relative to the three project sites and other KOP and landscape character photo locations.

Attached are Figures DR97-1a and DR 97-1b, which present an existing condition view and a visual simulation of Ivanpah 2 and 3 project sites, as seen from KOP 3, the Yates Well Road exit off I-15 (approximately 2.4 miles away).

Attached are Figures DR97-2a and DR97-2b, which present an existing condition view and a visual simulation of the Ivanpah 1 project site, as seen from the Yates Well Road exit off I-15 (approximately 1.2 miles away from the eastern boundary of the Ivanpah 1 project site). This is the closest I-15 location to the project.

A single-lens reflex 35-mm camera with a 50-mm lens (view angle 40 degrees) was used to take the photographs that were used for these simulations.



98. Please discuss the feasibility of siting Ivanpah 1, which is the only phase proposed within a distance zone potentially prominent to I-15, further westward outside of the near middleground distance zone of I-15.

**Response:** There is not much flexibility in moving Ivanpah 1 either west or southwest. As shown in AFC Figure 1.3-1, Ivanpah 1 cannot be moved much farther west without affecting the existing transmission line right-of-way and it cannot be moved farther southwest without going outside the Property Boundary of the area requested from BLM. In addition, moving the site farther west or southwest increases the grade and will increase the length of the linear corridors (transmission line, gas line and water line). As presently situated, the distance from the closest corner of Ivanpah 1 to I-15 is approximately 0.9 miles. The distance to the closest power tower (which would be the most visible part of the project) is approximately 1.2 miles away. For a driver looking at a 45 degree angle from the direction of travel toward the site, the project corner would be about 1.2 miles away and the closest power tower would be 1.7 miles away. At that angle, the distance to the Ivanpah 1 power block would be 2.2 miles away. Therefore, only the two power towers would be in the driver's near middleground view.

View durations of the Ivanpah 1 project site at its current location from northbound travelers on I-15 have been calculated. The Nipton Road exit is approximately 4 miles south of the southern border of Ivanpah 1; the exit is approximately 5.6 miles south of the southern border of the Primm Valley Golf Club. The speed limit along I-15 is 70 miles per hour (mph) for autos; traveling northbound on I-15 for the 5.6 miles at 70 mph would provide a view of the project for 4.8 minutes. At the exit and along the southern 2.6 miles of I-15 between the exit and the southern border of the golf club, a background view of the project (i.e., a view greater than 3 miles away) is provided for 2.2 minutes. A middleground view of the project (0.5 mile to 3.0 miles) would be provided for the remaining 2.6 minutes. Even as the project sites are being passed on I-15, a foreground view of the project is not provided because the project sites are located more than 0.5 mile from I-15.

## **Background**

According to the AFC (Figure 5.6-1), the proposed project lies within 1 mile of a designated National Scenic Area (NSA).

## **Data Request**

99. Please identify and describe the NSA further and, particularly, describe any recreational trails or other potential user destinations within the NSA that would have a view of the ISEGS project.

**Response:** AFC Figure 5.6-1 shows an area to the west of the project that is designated as a National Scenic Area (NSA), which was under the management jurisdiction of the Bureau of Land Management. With the passage of the California Desert Protection Act in 1994, Congress abolished the East Mojave National Scenic Area (shown in the figure) and established the Mojave National Preserve, transferring the management jurisdiction to the National Park Service. Most of the Mojave National Preserve is



located to the south of the project on the south side of I-15. However, the NSA area shown in AFC Figure 5.6-1 is part of a small non-contiguous portion of the Preserve. The only area within that portion of the Preserve that would have a view of the project site is the valley floor and the eastern slope of Clark Mountain. The only trail located on the eastern slope of Clark Mountain is the extension of Colosseum Road, which forks in the valley and each fork continues west up the side of Clark Mountain. Views toward the project sites from Clark Mountain would be background views (see AFC Figure 5.13-2). The Applicant is unaware of any other potential user destinations in that area of the Preserve. The Applicant is checking with BLM to determine if there are any other designated trails on the east side of Clark Mountain or other potential user destinations.

100. Identify an appropriate range of affected viewers to base analysis upon, including recreational viewer groups in addition to golf course visitors.

**Response:** The Applicant has requested recreation use data from the BLM (for the Stateline Wilderness Area, Mesquite Mountain Wilderness Area, Clark Mountain Range, and Ivanpah Dry Lake Bed), National Park Service (NPS) (for the Mojave National Preserve [which includes Clark Mountain]), and from Primm Valley Golf Club (for its use numbers). The data from the BLM and Primm Valley Golf Club will be submitted to the CEC after it is received. Provided below is information from NPS for the Mojave National Preserve.

The Mojave National Preserve is considered to be scenic. Throughout the entire Preserve (not just the small non-contiguous portion that is near the project), there are more than 1,000 miles of trails that are used for hiking, mountain biking, and 4-wheel drive trucks. Most use in the Preserve is sightseeing and driving for recreation; however, hunting, nature study, and rock-climbing also occur. No off-road 4-wheel drive activity is allowed. Primitive camping is allowed at established sites only. Most visitation to the Preserve occurs between October and May. Permits are issued only for groups of more than 6 vehicles. Recreational use for just the small non-contiguous portion of the Preserve is not tracked; in March 1997, 14,617 vehicles entered the entire Preserve. Annual visitation to the entire Preserve could increase by 200,000 visitors by 2016. The sources of this information are:

McKeever, Dora. Interpretive Park Ranger. National Park Service. 2008.  
Personal communication with Wendy Haydon/CH2M HILL on January 8, 2008.

National Park Service. 2002. Mojave National Preserve General Management Plan. April. Accessed online on January 8, 2008 at <http://www.nps.gov/moja/parkmgmt/gmp.htm>.

The 2004 Mojave Visitor Study indicated that 9 percent of visitors to the Mojave National Preserve in October 2003 visited the Clark Mountain area, 7 percent of visitors' first entry point into the Preserve was Clark Mountain, and 10 percent of visitors' departure point from the Preserve was Clark Mountain. The source of this information is:

University of Idaho, Park Studies Unit. 2004. Mojave National Preserve Visitor Study, Fall 2003. Report 151. July. Prepared for the Social Science Program, National Park Service, U.S. Department of the Interior, Visitor Services Project.

Assuming a worst-case scenario of 15,000 vehicles entering the entire Preserve every month of the year<sup>2</sup>, then 180,000 vehicles would enter the entire Preserve annually, and 12,600 to 18,000 vehicles would be within the Clark Mountain area annually. A range of the number of visitors to the Clark Mountain area was estimated using the number of people per vehicle from the Mojave National Preserve Visitor Study, resulting in a worst-case scenario of 28,728 to 41,040 visitors annually to the Clark Mountain area. As a worst-case, all of these visitors would have potential views of the proposed project.

101. Discuss the potential for the project to significantly affect viewers from the Ivanpah lakebed (east and west), various backcountry routes surrounding the site, particularly to the north and west, in the Mesquite Wilderness, and the Clark Mountains within the Mojave National Preserve.

**Response:** The project has the potential to be visible from trails on the south-facing slopes of the Mesquite Mountain Wilderness and Stateline Wilderness areas and the east-facing slopes of Clark Mountain within the Mojave National Preserve. In addition, it has the potential to be visible from certain locations within the Ivanpah Dry Lake (e.g., areas that are higher in elevation than I-15 and the project sites and/or areas that do not have views obstructed by existing development [such as the casinos and golf course]).

Similar to any type of development that is proposed near a recreation area, open space area, or residential development, it can be expected that some viewers (i.e., recreationists) would dislike the presence of the proposed project and its change to the landscape, and may choose to recreate elsewhere. Other viewers are expected to be fascinated by the presence of the proposed project and its change to the landscape due to it being a relatively scarcely seen design. The project would change the local landscape from an undeveloped site to a developed one, and may create visual variety and interest.

## Background

The description of the project's appearance in Section 5.13.4.4, as well as the project description, provide depictions of the power generation facilities, but very little of the mirror arrays, and none of the mirror components. However, a much better understanding of the mirror component of the project is needed to understand and evaluate the project operation and, specifically, the potential for glare impacts and glare mitigation. For example, the AFC states that the mirrors would be operated to avoid glare on I-15 and the Primm Valley Golf Club (p. 5.13-28).

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<sup>2</sup> This is a worst-case scenario because recreation use would likely decline substantially during the summer months due to the heat.

## **Data Request**

102. Please provide elevation drawings presenting the dimensions of the proposed mirror units.

**Response:** See Figure DR102-1 showing dimensions of the proposed heliostats.

103. Please provide a more detailed description of the individual and collective mirror unit control capabilities sufficient to substantiate the ability of the project to avoid creating glare in specific sensitive receptor locations.

**Response:** Each heliostat is controlled locally by a smart local motion controller. The controller is capable of calculating sun position and uses it and the target (installed on the top of the power tower) coordinates to calculate the exact heliostat Elevation and Azimuth and move it to the required positions. All of the heliostat controllers are connected together through the communication network to the Main Solar Field Control (SFC) system. The SFC also receives data from the receiver, the weather station, safety cameras, Balance of Plant programmable logic controllers and the operator. The SFC is based on dual redundant servers with 99.999 percent survivability (dual servers - each have dual power supply, dual processors, 5 backup hard disks). According to the above data and following the functional specification, the SFC controls the solar field in predefined modes of operation (Emergency, Sleep, Tracking, Wind, and Standby). If the heliostat controller loses its connection with the control center it would automatically move to a safe predefined position. Hence, positions that could reflect sunlight on vehicles traveling along I-15 or toward players at the golf course would be locked out.

104. Please provide a more detailed description of the criteria and methods by which avoidance of such glare on any potentially affected sensitive receptors would be accomplished.

**Response:** Please see Attachment DR89-1.

## **Background**

According to the AFC, sunlight on airborne dust particles would result in visible light rays, as depicted in the visual simulations. These could represent the primary visual effect of the project.

## **Data Request**

105. Please explain whether any modeling or other studies have been conducted to estimate the likely frequency, duration or intensity of the anticipated dust reflection.

**Response:** No modeling has been performed and we are not aware of a model designed for that purpose. The possible sunlight reflection on airborne dust particles would be less than the glare from the solar receivers on top of the Solar Power Towers. For the glare discussion, see Data Response 90.

106. To the extent possible please provide a discussion of the anticipated range of intensity or brightness (luminance) of this reflected sunlight effect. Please also discuss the anticipated level of brightness (luminance) of the glow emitted by the solar boilers.

**Response:** The possible sunlight reflection on airborne dust particles would be less than the glare of the solar receivers (or “solar boilers”) on top of the Solar Power Towers. For the glare discussion, see Data Response 90.

## **Background**

Staff requests additional information to assist in evaluating potential cumulative visual impacts.

## **Data Request**

107. Please provide a map depicting alternative routes of the proposed Desert Xpress Train in the broad ISEGS vicinity; and boundaries of the proposed Ivanpah Valley Airport and Table Mountain Wind Energy Facility.

**Response:** Figure DR107-1 is a map of the proposed DesertXpress High Speed Train Project. The source of this map is:

CirclePoint, 2006. DesertXpress High Speed Train Summary Report. Public Scoping Meetings. July 2006. Prepared for the Federal Railroad Administration. October. Accessed online on January 3, 2008 at <http://www.fra.dot.gov/us/printcontent/1703>.

Figure DR107-2 is a map of the proposed Ivanpah Airport. The source of this map is:

Clark County Department of Aviation, Planning and Construction Division. 2006. Proposed Ivanpah Airport map. Accessed online on January 2, 2008 at [http://www.mccarran.com/images/IVP\\_8x11.jpg](http://www.mccarran.com/images/IVP_8x11.jpg).

Figure DR107-3 is a map of the proposed Table Mountain Wind Energy Project. The source of this map is:

Acciona. No Date. Proposed Table Mountain Wind Energy Project map. Personal communication between Wendy Haydon/CH2M HILL and Lucas Lucero. PMP, National Project Manager, U. S. Bureau of Land Management, Las Vegas Field Office on January 3 and 4, 2008.

108. Please discuss any permit applications or publicly announced proposals for future urban development in the wider Ivanpah Valley and I-15 corridor.

**Response:** Per Loretta Mathieu, Senior Planner at San Bernardino County, the only application that the County has received in the project area was for remodeling and expanding the kitchen at the Primm Valley Golf Club.

109. Please provide a list of other solar and wind development projects known to be under consideration within 30 miles of the project.

**Response:** Per the CEC website, the Ivanpah SEGS is the only solar project which has filed an AFC for a site within 30 miles, and per the BLM California Desert District website, the BLM has not initiated an EIS for any other proposed project within 30 miles. San Bernardino County has not received any wind or solar applications for this area (see 108 above).

There are wind and solar projects which have filed interconnection requests with the CAISO and which have filed ROW applications with the BLM, but have not proceeded further with permitting. These projects may or may not be “under consideration.” There is some evidence that suggests at least one of these projects may have been dropped, but the BLM application has not been withdrawn. There is also an overlap between the land descriptions of several projects (CACA #48759, 49005, 48666), which BLM may be able to clarify.

**Identified Projects in the CAISO Queue and with BLM Applications:**

- PPM Energy, 63 MW wind, near Mountain Pass (CAISO # 131, BLM #CACA 44236)
- OptiSolar / Gen3 Solar Inc., 300 MW solar, near Primm (CAISO #163, BLM # CACA 48669)
- Solar Partners VI, LLC, 400 MW solar, near Jean Lake (CAISO # 234, BLM application at Las Vegas BLM)
- Unidentified Project in the CAISO Queue
- [Owner unknown], 1500 MW wind, in Clark County interconnecting at El Dorado (#126). This project may be within 30 miles if it is located near McCullough Pass, but the exact location is not known. BLM Las Vegas may have information on this project which is not yet public.

**Projects Listed on the BLM website:**

- Solar Investments XIII, LLC, 1000 MW solar, near the New York Mountains T13N, R17E and T14N, R17E (CACA 48759)
- Boulevard Associates, LLC, 1000 MW solar, near Rose, T13 N, R17E and T14N, R17E (CACA 49005)
- PG&E, MW unspecified solar, near Mesquite Lake T19N, R12E; R18N, R13E; T19N, R13E; T18N, R14E (CACA 49429)
- Oak Creek Energy, MW unspecified solar, T13N, R17E; T14N, R17E; T15N, R17E; T14N, R18E; T15N, R18E (CACA 48666)
- Clipper Windpower, 50 MW wind, near Mountain Pass, T16N, R13E, T16 N, R14E; T17N, R14E (CACA 44236) [This project gave up CAISO queue position #15 in July 2007, and may not be “under consideration” but that is not certain.]

**Projects Known on Nevada BLM lands:**

- Solar Investments I, LLC, 1000 MW solar, near Jean lake
- Table Mountain Wind Energy Facility, 150 to 205 MW wind, near Primm and Goodsprings

The BLM is in a better position to determine whether these projects are still under consideration or not, and to clarify whether any are competing for the same land as may be the case with three listed above. As to private land within 30 miles of the project site, there is very little. In Nevada, there is inadequate private land near Primm or Jean for solar development, and the private land in El Dorado Valley is under Boulder City jurisdiction and it is barred from development except for a small area near the El Dorado substation, more than 30 miles away. In California the Mesquite Valley and Lanfair Valley have private land, but these areas are fairly distant from transmission lines. There is also some private land around Cima, which is surrounded by the Mojave National Preserve. The Applicant is not aware of any wind or solar projects under consideration on private land in California within 30 miles. (See communication from Loretta Mathieu, in DR 108 above).

**Background**

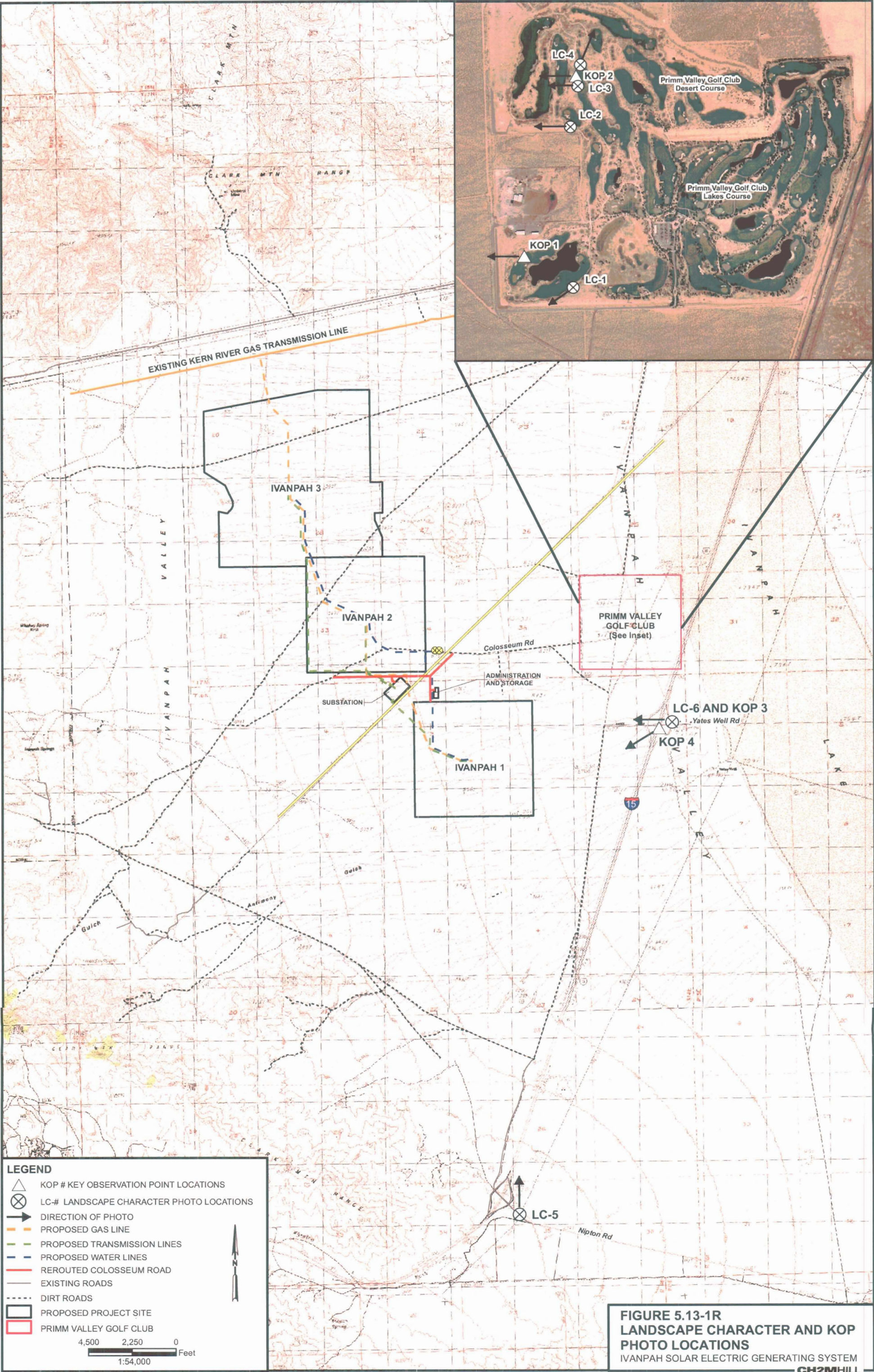
Section 5.13.4.4.6 (p.5.13-29) states that construction could occur 24 hours a day, 7 days a week, at certain periods of project construction. Staff needs an estimate of the duration of these 24/7 construction periods so it can evaluate the potential for nighttime construction glare impacts.

**Data Request**

110. Please discuss the anticipated duration of the 24/7 construction periods for the three project phases.

**Response:** Currently it is anticipated that construction would generally be limited to daylight hours. However, nighttime work may occur in discrete areas for limited periods of time as required to meet the project schedule. It is anticipated that less than 5 percent of construction activities would occur at night.









KOP 3: Existing view looking northwest toward the Ivanpah 2 and 3 project sites from the Yates Well Road exit off I-15. This is the nearest view to the Ivanpah 2 and 3 sites from an I-15 viewpoint (approximately 2.4 miles from the southeastern corner of the Ivanpah 2 site boundary). This photo is also included as a Landscape Character photo (Figure 5.13-8).

**FIGURE DR97-1a**  
**EXISTING VIEW OF IVANPAH 2 and 3**  
**FROM KOP 3 (Yates Well Road Exit off I-15)**  
 IVANPAH SOLAR ELECTRIC GENERATING SYSTEM



KOP 3: Simulated "with-project" view looking west toward the Ivanpah 2 and 3 project sites from the Yates Well Road exit off I-15.

**FIGURE DR97-1b**  
**SIMULATED VIEW OF IVANPAH 2 and 3**  
**FROM KOP 3 (Yates Well Road Exit off I-15)**  
 IVANPAH SOLAR ELECTRIC GENERATING SYSTEM





KOP 4: Existing view looking southwest toward the Ivanpah 1 project site from the Yates Well Road exit off I-15. This is the nearest view to the Ivanpah 1 site from an I-15 viewpoint (approximately 1.25 miles from the eastern Ivanpah 1 site boundary).

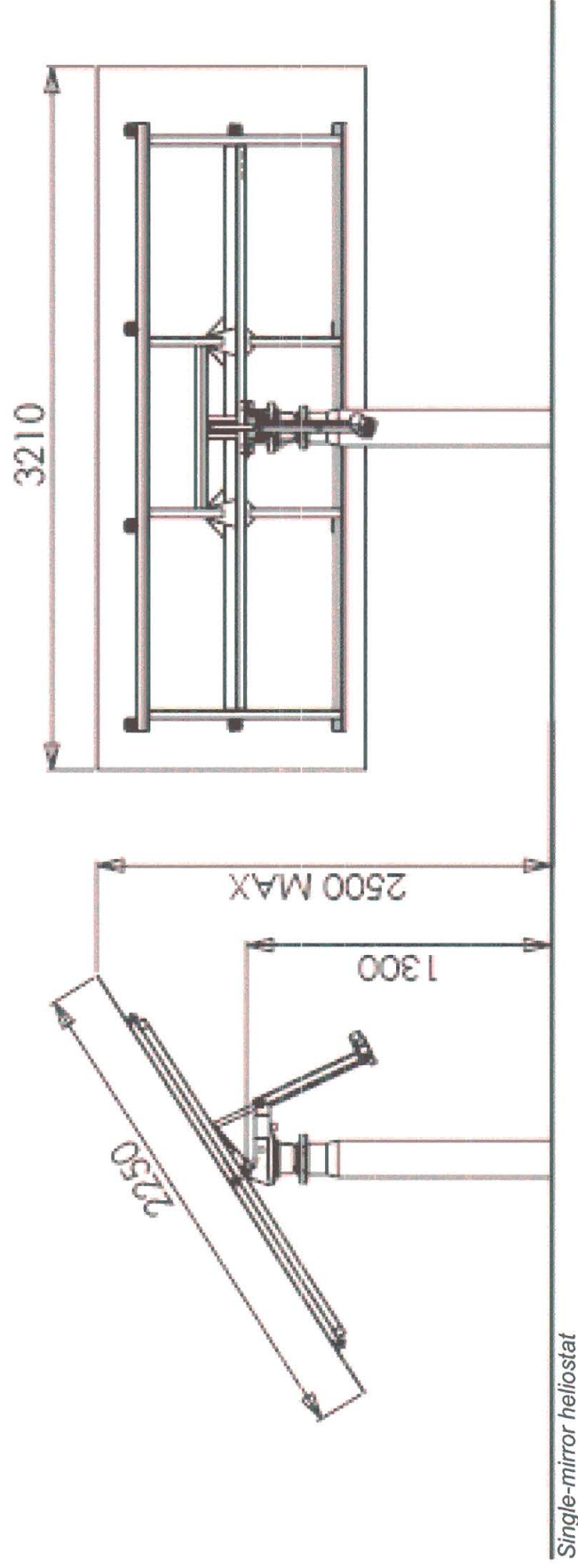
**FIGURE DR97-2a**  
**EXISTING VIEW OF IVANPAH 1**  
**FROM KOP 4 (Yates Well Road Exit off I-15)**  
 IVANPAH SOLAR ELECTRIC GENERATING SYSTEM



KOP 4: Simulated "with-project" view looking southwest toward the Ivanpah 1 project site from the Yates Well Road exit off I-15.

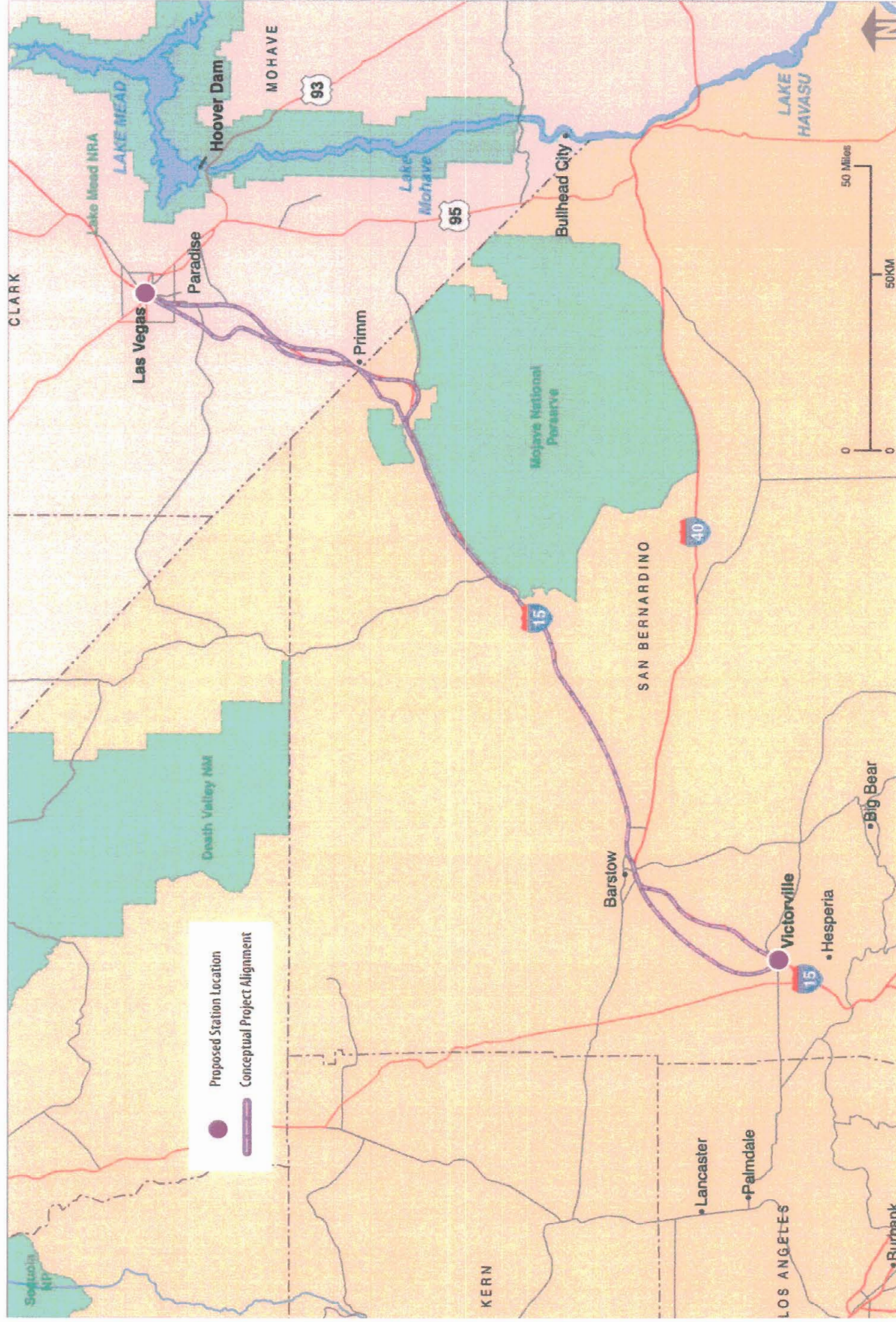
**FIGURE DR97-2b**  
**SIMULATED VIEW OF IVANPAH 1 FROM**  
**KOP 4 (Yates Well Road Exit off I-15)**  
 IVANPAH SOLAR ELECTRIC GENERATING SYSTEM





Note: Units are in millimeters.

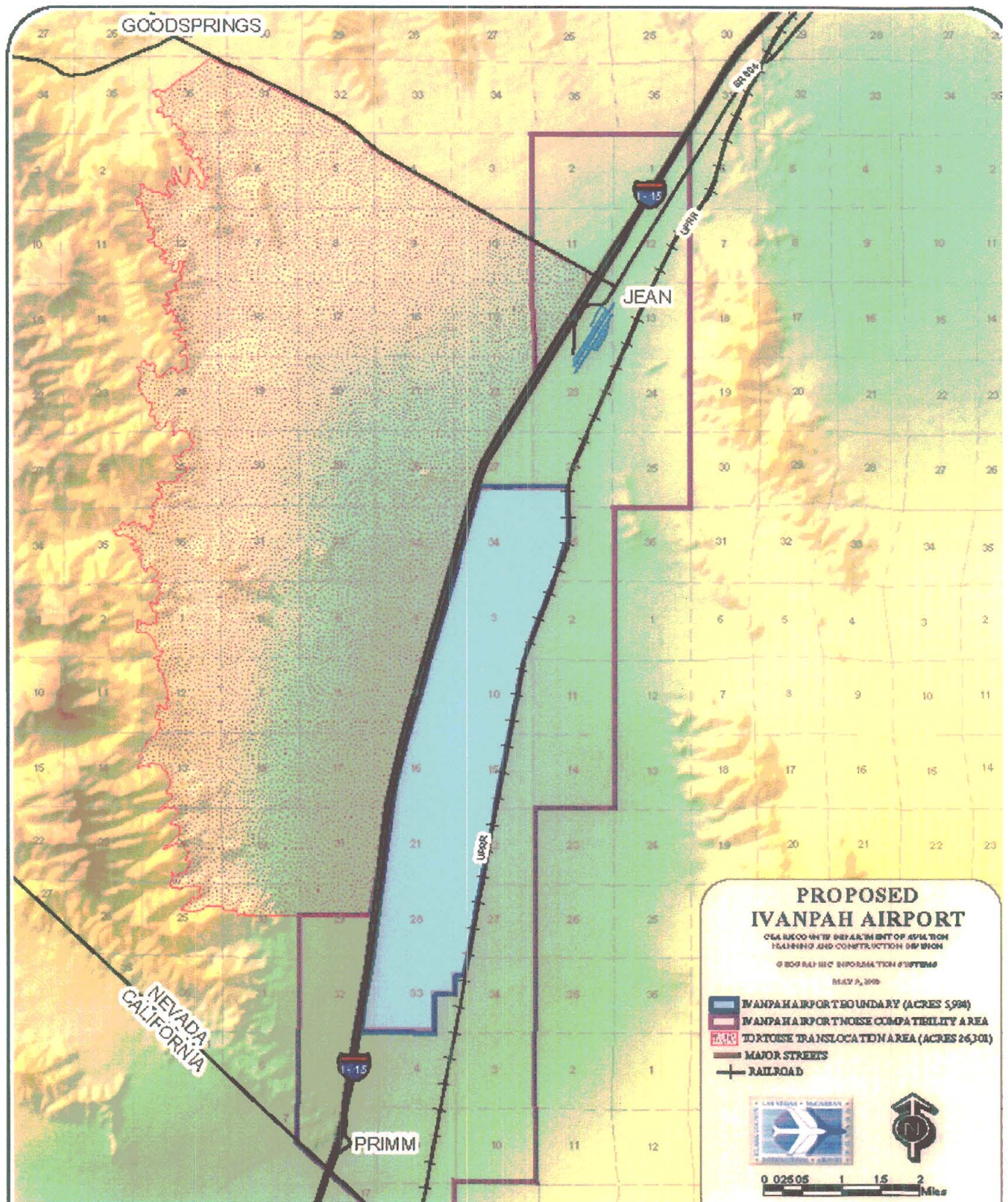
**FIGURE DR102-1**  
**CONCEPTUAL HELIOSTAT**  
**DRAWING**  
 IVANPAH SOLAR ELECTRIC GENERATING SYSTEM



**FIGURE DR107-1  
LOCATION OF PROPOSED  
DESERTXPRESS HIGH SPEED  
TRAIN PROJECT**

Source: CirclePoint, 2006.

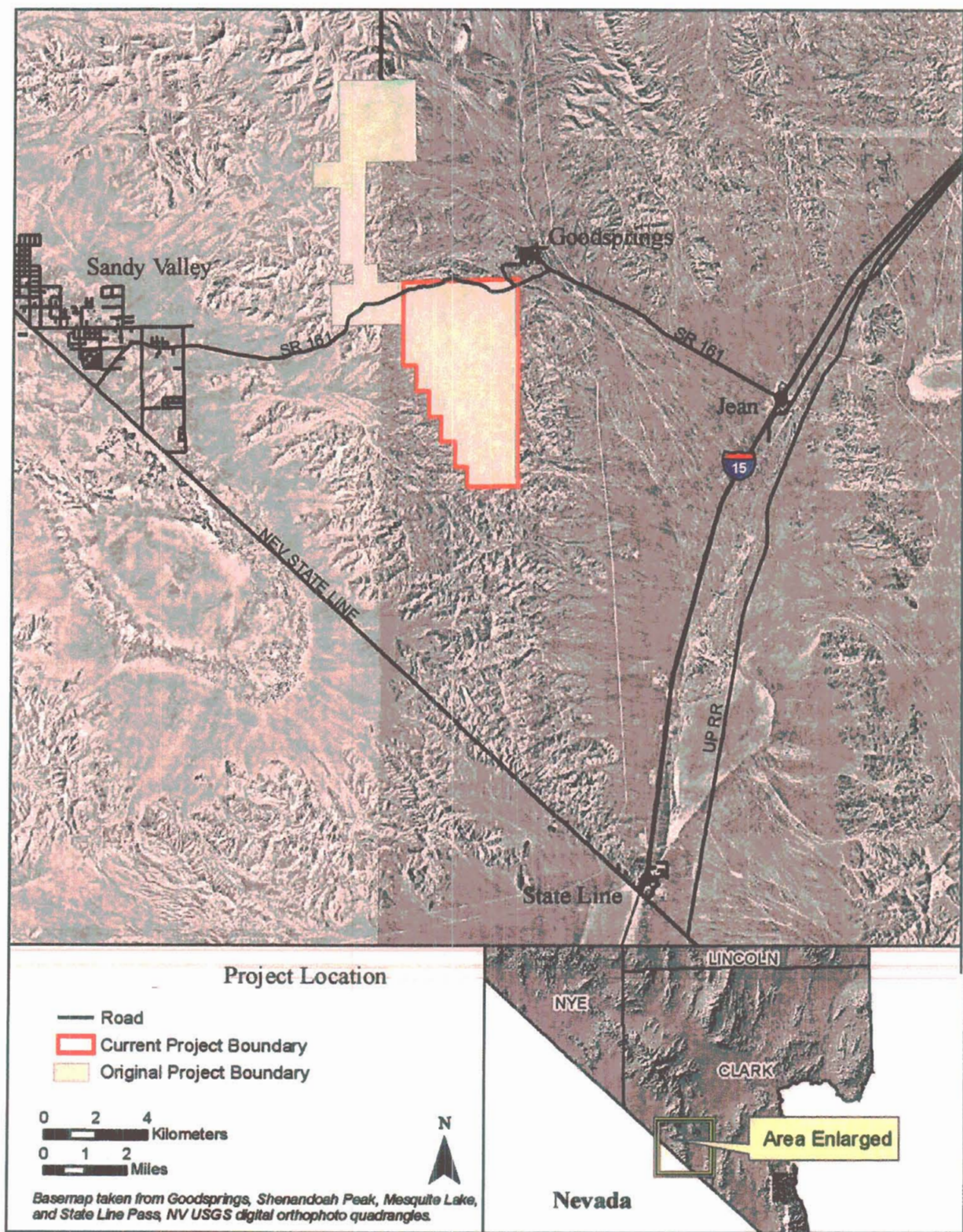




**FIGURE DR107-2**  
**LOCATION OF PROPOSED**  
**IVANPAH AIRPORT**  
 IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

Source: Clark County Department of Aviation,  
 Planning and Construction Division, 2006.





**FIGURE DR107-3  
LOCATION OF PROPOSED TABLE  
MOUNTAIN WIND ENERGY  
PROJECT**

IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

Source: Acciona, No Date.

# Waste Management (111 – 116)

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## Background

The project proposes discharging secondarily treated wastewater from package treatment systems to the power plant landscaping. There will be a package treatment system associated with each of the three heliostats proposed and a larger package treatment system at the administration building area.

## Data Request

111. Please develop and submit a draft Wastewater Discharge Plan for the smaller heliostat package treatment systems and the larger administration building package treatment system. This Plan should include but not be limited to:
  - a) piping diagrams
  - b) whether the discharge from each treatment system will be to the surface or below ground
  - c) if discharge is to the surface, then please describe:
    - the sprinkler/drip system type, coverage, and volume, including illustrating figures, and
    - surface area potentially affected by sprinkler/drip spray during seasonal high winds and during daily average winds
  - d) mitigation and notification procedures in the event of broken lines and/or broken sprinklers/drip nozzles
  - e) control measures to ensure no offsite discharge of effluent wastewater
  - f) structural and mechanical details about the “package treatment system” for each heliostat and for the larger package system that will be located near the administration building. These details should include but not be limited to treatment process diagrams and influent treatment capabilities
  - g) please numerically describe the physical and chemical characteristics of the water quality and organic and inorganic constituents, including trihalomethanes, after treatment by each package treatment system (i.e., the effluent discharge). This description should at a minimum include all the analysis that would be required by the RWQCB as part of the routine effluent discharge monitoring
  - h) please discuss the influent and effluent monitoring requirements associated with each package treatment plant and discharge of secondarily treated water to the power plant landscaping



- i) a detailed discussion of how the wastewater discharge from each package treatment system would comply with California Title 22 wastewater discharge requirements.

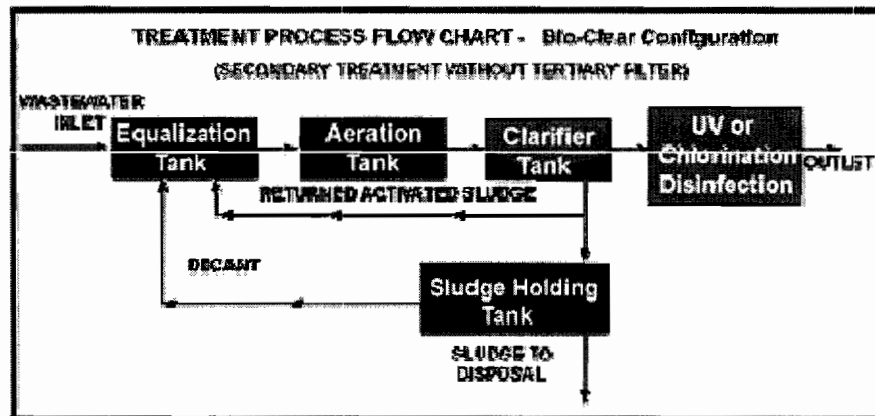
**Response:** The Ivanpah SEGS project will use package treatment systems. All of the wastewater package treatment systems will use the same process, but be sized according to the anticipated flow. A building equipped with kitchen, toilets, and showers can be estimated to consume 75 gallons per day (gpd) of water under maximum flow conditions. For Ivanpah 1, an estimated 20 employees will be on site producing approximately 1,500 gpd of domestic waste. Preliminary sizing is for a 2,000 gpd domestic wastewater treatment plant.

The system will include secondary treatment without a tertiary filter. Pre-treatment will remove large solid objects that float or settle. The waste will then move to an aeration tank where bacteria microbes will dissolve 85 to 98 percent of the solids and organic matter. Before the clean effluent water is distributed to the land irrigation system, it will be disinfected for pathogens using tablets of calcium hypochlorite (or UV light), administered in the chlorination disinfection tank (or UV tank). If necessary, an additional anoxic chamber may be used to remove excess nitrates and oxygen. Discharge to surface will either be a drip (surface or subsurface) or a spray type of system depending on the specific system selected. Either system will also incorporate low angle and low pressure discharge so that wind and other environmental factors will be minimized during water discharge. Irrigation facilities are not anticipated to be located at least 18 inches below the ground surface, and surface discharge requirements are applicable to the project.

Regulations and requirements applicable for water discharged from each package treatment system to the power plant landscaping are specified in the California Code of Regulations, Title 22, Chapter 3-Water Recycling Criteria. As described in the Code, reclaimed water that will be used for irrigation of nonedible vegetation with access control to prevent use as a park, playground or school yard will require treatment to the "Disinfected Secondary-23 Recycled Water" level. Disinfected Secondary-23 Recycled Water will be oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) of 23 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 240 per 100 milliliters in more than one sample in any 30 day period. The Code includes various additional requirements and specifications on the area of use of recycled water that will be following in selecting an appropriate package treatment plant.

All system effluent shall meet the water quality requirements as specified under Titles 22 and 23 and any other additional standards that may apply as determined by the Lahontan Regional Water Quality Control Board (RWQCB) or other regulatory agency. A Waste Discharge Permit will be obtained and a Monitoring and Reporting Program will be established.

A typical system flow diagram is shown below.



## Background

Please review the letter dated October 25, 2007, by the RWQCB posted on the CEC project webpage. Item 2 discusses the use of concrete lined surface impoundments for emergency wastewater discharge. Item 3 of this letter outlines several requirements for using treated domestic wastewater for landscaping.

## Data Request

112. Please discuss in detail the following regarding the two concrete drying beds mentioned in section 2.2.7.4.4 (Drying Beds) of the AFC:

a) what is the quality of water expected to enter these beds?

**Response:** As discussed in Data Response 27a, during commissioning hydrostatic and boiler passivation water is expected to enter the concrete holding basins. While it is not possible to quantify the exact water composition after these procedures, the water will initially be demineralized well water without the addition of chemicals (Please refer to AFC Section 5.15.3.1.2 Groundwater, Table 5.15-3 for a detailed analysis of the well water and its constituents). The discharged water is expected to have some trace amounts of iron, chrome, and nickel impurities from the piping, however this should be minimal and under any levels deemed toxic. All piping will arrive from the fabricator clean and capped to prevent any contamination during handling, storage, or installation.

b) what is the volume of water expected to enter these beds?

**Response:** As discussed in Data Response 27a, during commissioning, approximately 200,000 gallons of water from hydrostatic testing and boiler and piping passivation is expected to enter the concrete holding basins. This is the average volume expected over the entire construction period. During normal operation, the basins are expected to remain empty.



c) how often are these beds expected to be used?

**Response:** During normal plant operation, the concrete holding basins are expected to remain empty except for occasional rain, intermittent equipment wash water and emergency equipment drains.

d) how long is the water expected to remain in the beds?

**Response:** As discussed in Data Response 27a, if the water discharged from hydrostatic testing and boiler and piping passivation is shown to have unacceptable toxicity levels, it will be vacuum trucked to the nearest proper disposal facility. If the discharged water is still of good quality, it will be pumped and discharged to grade or reused. Therefore, during the construction and commissioning period water is not expected to remain in the basins longer than two or three days. During normal plant operation, the basins are expected to remain empty. In the case of water discharged due to equipment malfunction, the water will be returned to the cycle after maintenance is performed, therefore only a few days maximum storage time will be required. In case of major equipment malfunction, water will be stored in the basins until repairs can be made.

e) what is the percentage or ratio of water expected to evaporate from the beds versus water percolating (if the beds have some degree of permeability)?

**Response:** The basins will be concrete lined; therefore there will be no water leakage into the ground. A small amount of water will be evaporated to the atmosphere, due to the minimal time that water will be stored in the basins.

f) why were concrete lined as opposed to unlined beds chosen?

**Response:** Concrete beds were chosen because of permeability and economic issues. A liner is necessary to prevent any leakage and ground contamination. While concrete is more expensive than a traditional HDPE or PVC based liner, it provides better reliability and less maintenance.

113. Please discuss the RWQCB regulations and requirements applicable for water discharged from each package treatment system to the power plant landscaping.

**Response:** Regulations and requirements applicable for water discharged from each package treatment system to the power plant landscaping via surface discharges (ground surface to 18 inches below the ground surface) are specified in the California Code of Regulations, Title 22, Chapter 3-Water Recycling Criteria. As described in the Code, reclaimed water that will be used for irrigation of nonedible vegetation with access control to prevent use as a park, playground or school yard will require treatment to the "Disinfected Secondary-23 Recycled Water" level. Disinfected Secondary-23 Recycled Water will be oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) of 23 per 100 milliliters using the bacteriological results of the last 7 days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 240 per 100 milliliters in more than one sample in any 30-day period. The Code includes

various additional requirements and specifications on the area of use of recycled water.

In addition, the U.S. Environmental Protection Agency (USEPA) has established recommended limits for constituents in reclaimed water for irrigation. These requirements are provided in Table DR113-1 below.

**TABLE DR113-1**

USEPA's Recommended Limits for Constituents in Reclaimed Water for Irrigation

Constituent	Long-Term Discharge/Use (mg/L)
Aluminum	5.0
Arsenic	0.10
Beryllium	0.10
Boron	0.75
Cadmium	0.01
Chromium	0.1
Cobalt	0.05
Copper	0.2
Fluoride	1.0
Iron	5.0
Lead	5.0
Lithium	2.5
Manganese	0.2
Molybdenum	0.01
Nickel	0.2
Selenium	0.02
Vanadium	0.1
Zinc	2.0
Constituent	Recommended Limit
pH	6.0
TDS (total dissolved solids)	500 to 2,000 mg/L
Free Chlorine Residual	< 1 mg/L

Source: U.S. Environmental Protection Agency. Guidelines for Water Reuse. September 2004. Available at: <http://www.epa.gov/ord/NRMRL/pubs/625r04108/625r04108.pdf>

As described in the AFC, landscape may be irrigated below the surface. However, irrigation facilities are not anticipated be located at least 18 inches below the ground surface, and the surface discharge requirements are applicable to the project.

114. Discuss how the proposed treatment systems would comply with RWQCB regulations and requirements.

**Response:** In selecting a package treatment plant, it will be specified that the plant discharge meet or exceed the California Code of Regulations requirements for Disinfected Secondary-23 Recycled Water and meet or exceed the USEPA's recommended limits for constituents in reclaimed water for irrigation.

115. Provide a schedule of when the requirements outlined in the October 25, 2007 RWQCB letter will be fulfilled and a copy of any application or report submitted to either the California Department of Health Services, RWQCB, or San Bernardino County Department of Health Services.

**Response:** The RWQCB October 25, 2007 letter includes the RWQCB's comments and potential issues of concern with respect to the Ivanpah SEGS. Item 3 of the letter outlines requirements for use of recycled treated domestic wastewater for landscape irrigation purposes. It is assumed that Data Request 115 is in reference to Item 3 of the RWQCB's October 25, 2007 letter. The appropriate reports and permit applications will be filed once a package treatment plant has been selected. A certified operator to operate the package treatment plant will be employed prior to start-up of plant.

116. Summarize any discussions to date with the RWQCB regarding the use of domestic wastewater for landscaping

**Response:** At the time of preparation of this Data Response, no discussions have occurred between the Applicant and the RWQCB regarding the use of domestic wastewater for landscape irrigation.

**BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE  
OF CALIFORNIA**

**APPLICATION FOR CERTIFICATION  
FOR THE *IVANPAH SOLAR ELECTRIC  
GENERATING SYSTEM***

Docket No. 07-AFC-5

**PROOF OF SERVICE  
(Revised 12/7/2007)**

**INSTRUCTIONS:** All parties shall 1) send an original signed document plus 12 copies OR 2) mail one original signed copy AND e-mail the document to the web address below, AND 3) all parties shall also send a printed OR electronic copy of the documents that shall include a proof of service declaration to each of the individuals on the proof of service:

CALIFORNIA ENERGY COMMISSION  
Attn: Docket No. 07-AFC-5  
1516 Ninth Street, MS-14  
Sacramento, CA 95814-5512  
[docket@energy.state.ca.us](mailto:docket@energy.state.ca.us)

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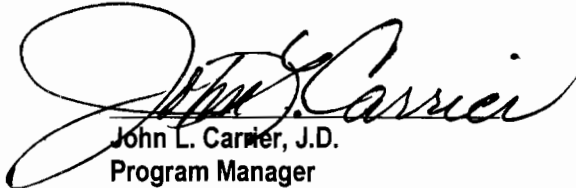
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**DECLARATION OF SERVICE**

I, John L. Carrier, declare that on January 14, 2008, I deposited copies of the attached Data Response, Set 1A in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above.

I declare under penalty of perjury that the foregoing is true and correct.



John L. Carrier, J.D.  
Program Manager