Theodore D. Schade
Air Pollution Control Officer

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

157 Short Street, Bishop, California 93514-3537 www.gbuapcd.org
Tel: 760-872-8211 Fax: 760-872-6109 info@gbuapcd.org

August 1, 2012

Mike Monasmith
Senior Project Manager
California Energy Commission
1516 Ninth Street MS-15
Sacramento, CA 95814-5112

Re: Notice of Final Determination of Compliance (FDOC)
Facility: Hidden Hills Solar Electric Generating System (11-AFC-02)
Location: Southeastern corner of Inyo County, CA

Dear Mr. Monasmith:

The Great Basin Unified Air Pollution Control District (District) has completed the final determination of compliance (FDOC) for the Hidden Hills Solar Electric Generating System in accordance with District Rule 209-A – Power Plants, Section E.7. Please find the enclosed FDOC, including appendices.

If you have any questions regarding this matter, please contact Jon Becknell or myself at (760) 872-8211.

Sincerely,

Theodore D. Schade
Air Pollution Control Officer

Enclosure

Cc: Mike Tollstrup, Chief, Project Assessment Branch, Stationary Source Division, CARB
Gerardo C. Rios, Chief, Permits Office, Air Division, U.S. E.P.A. - Region IX
John M. Woolard, Chief Executive Officer, BrightSource Energy, Inc.
Cindy R. MacDonald, Intervener

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FINAL DETERMINATION OF COMPLIANCE

California Energy Commission Application for Certification № 11-AFC-02

District ATC Permit Applications 1604-00-11, 1605-00-11 and 1606-00-11

Hidden Hills Solar 1 Power Plant, Hidden Hills Solar 2 Power Plant and Common Area

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Prepared by: Jonathan Becknell
Great Basin Unified Air Pollution Control District

August 1, 2012

Dates Application Materials Received:

Original: August 8, 2011: Single application for all facilities, including Application for Certification (AFC) for the Hidden Hills Solar Electric Generating System (HHSEGS) that was submitted to the California Energy Commission (CEC) on August 5, 2011. Application determined to be complete on September 9, 2011.

Supplemental: December 27, 2011: Revised District permit application forms submitted to reflect separate ownership of Hidden Hills Solar 1 Power Plant (1604-00-11), Hidden Hills Solar 2 Power Plant (1605-00-11) and Common Area (1606-00-11)

Revised: March 10, 2012: Boiler optimization, summary tables
April 6, 2012: Boiler optimization, full documentation

Preliminary Determination of Compliance (PDOC)

PDOC Issued: May 8, 2012: Filed with the CEC

Public Notice: May 10, 2012: Published in Inyo Register
May 11, 2012: Published in Pahrump Valley Times
June 11, 2012: End of public comment period

Company Name: Hidden Hills Solar I, LLC
Certified Official: John M. Woolard, Chief Executive Officer of BrightSource Energy, Inc., sole member and manager of Hidden Hills Solar Holdings, LLC, which is sole member and manager of Hidden Hills Solar I, LLC

Company Name: Hidden Hills Solar II, LLC
Certified Official: John M. Woolard, Chief Executive Officer of BrightSource Energy, Inc., sole member and manager of Hidden Hills Solar Holdings, LLC, which is sole member and manager of Hidden Hills Solar II, LLC

Project Name: Hidden Hills Solar Electric Generating System
Mailing Address: c/o BrightSource Energy, Inc.
1999 Harrison Street, Oakland, CA 94612
Phone: (510) 550-8464

Consultant: Nancy Matthews
Company Name: Sierra Research
Phone: (916) 273-5124
Email: NMatthews@sierraresearch.com

CEC Contact: Jacquelyn Leyva
Title: Air Resources Engineer
Phone: (916) 654-3846
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FINAL DETERMINATION OF COMPLIANCE

California Energy Commission Application for Certification № 11-AFC-02
District ATC Permit Applications 1604-00-11, 1605-00-11, 1606-00-11
Hidden Hills Solar 1 Power Plant, Hidden Hills Solar 2 Power Plant and Common Area

1. SCOPE OF DOCUMENT:

The Great Basin Unified Air Pollution Control District (District) is the agency delegated authority to review the application materials and to issue permits containing conditions that will ensure the project's compliance with all applicable District, California Air Resources Board (ARB) and federal Environmental Protection Agency (EPA) air pollution control regulations. Compliance with these rules is considered the legal standard for protecting all persons from the detrimental effects of regulated air pollutants. The following is the District evaluation of the applicant's proposal. This evaluation has been carried out in accordance with the requirements of District Rule 209-A, focusing on the emission sources, calculations and methodologies that contribute to the potential air quality impacts to ensure that the proposed project will comply with all applicable standards, regulation, significance and health risk thresholds and limits.

2. PROJECT DESCRIPTION:

The Hidden Hills Solar Electric Generating System (HHSEGS) project consists of two independently owned and operated facilities, Hidden Hills Solar 1 Power Plant (Solar 1) and Hidden Hills Solar 2 Power Plant (Solar 2), and a Common Area that is jointly owned. The two solar power plants will focus the sun's energy on solar receiver steam generators (SRSGs) that convert water to steam. The steam will be used to drive turbines to generate a net 500 megawatts (MW) of commercially available electrical power. Each 250 MW power plant will have equipment that is regulated as stationary sources of air pollutants, including natural gas-fired boilers and emergency diesel-fired engines that are subject to permit conditions, plus other supporting ancillary equipment that is exempt from permitting.

3. PROJECT LOCATION:

The project will be located in Inyo County, California on private lands of approximately 3,277 acre (5.12 square mile) area, just north of Charleston View (Calvada Springs) and Tecopa Road (Old Spanish Trail Highway), bounded on the northeast by the California-Nevada border.

4. EQUIPMENT SUBJECT TO PERMIT:

Each power plant will have a 249 million Btu per hour natural gas fired boiler that will be used during periods of the solar-powered boiler startup and transient cloudy conditions. Each solar plant will also have a 15 million Btu per hour natural gas fired nighttime preservation boiler to maintain overnight temperatures in the SRSG system and improve system startup efficiency. The common area and both power plants will each have an emergency backup generator and fire pump, all powered by diesel-fueled reciprocating internal combustion engines.

5. ANCILLARY EQUIPMENT:

Each power plant will have a heliostat array with about 90,000 heliostats, a power block containing a Rankine-cycle non-reheat steam turbine, a solar receiver steam generator atop a 750-foot tower, feed water heaters, a deaerator, an air-cooled condenser, a wet surface air cooler

(with high efficiency drift eliminator), small oil-water separators and diesel fuel aboveground storage tanks. The heliostats, steam turbines, SRSG, feed water heaters, dearators and air-cooled condensers are exempt from permitting because they have no air emissions. The oil/water separators and diesel fuel storage tanks are exempt per District Rule 201.H. The wet surface air coolers are exempt from permit requirements per District Rule 201.D.4:

> *The wet portion of the PDCS will be a small wet surface air cooler (WSAC). A WSAC uses mechanical, induced-draft technology in a closed circuit. In the fluid cooler, the process fluid to be cooled is pumped through coils and cooling water passes over the coils, cooling the process fluid by evaporation. In this system, the cooling water does not contact the process fluid.*

6. APPLICABLE RULES:

District Rules:

200	Permits Required	Applies
209-A	Standards for Authority to Construct	Applies
	BACT	Does not Apply
	Offsets	Does not Apply
	Air Quality Impact Analysis	Applies
	Power Plants	Applies
210	Conditional Approval	Applies
216	NSR Requirements for Determining Impact on Air Quality	Applies
217	Additional Procedures for Issuing Permits to Operate for Sources Subject to Title V	Applies
222	Construction or Reconstruction of Major Sources of HAPS	Does not Apply
300	Permit Fees	Applies
301	Permit Fee Schedules	Applies
400	Ringelmann Chart	Applies
402	Nuisance	Applies
403	Breakdown	Applies
404-A	Particulate Matter	Applies
404-B	Oxides of Nitrogen	Applies
416	Sulfur Compounds And Nitrogen Oxides	Applies

California Health & Safety Codes:

42706	Report of Violation of Emission Standard	Applies
44321	List of Substances (AB-2588)	Applies

California Code of Regulations:

13 CCR §2423	Exhaust Emission Standards and Test Procedures--Heavy-Duty Off-Road Diesel Cycle Engines (Tiers)	Applies
17 CCR §93115	Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition (CI) Engines.	Applies

Clean Air Act and Code of Federal Regulations:

CAA Title I, Part C	Prevention of Significant Deterioration	Does not Apply
CAA Title I, Part A	§112.r - Prevention of Accidental Releases	Does not Apply
40 CFR §68.130	List of Substances for Accidental Release Prevention	Does not Apply
CAA Title IV	Acid Deposition Control	Applies
CAA Title V	Permits	Applies
40 CFR 60 Subpart Db	New Source Performance Standards for Industrial-Commercial-Institutional Steam Generating Units	Applies to auxiliary boilers
40 CFR 60 Subpart Dc	New Source Performance Standards for Small Industrial-Commercial-Institutional Steam Generating Units	Applies to nighttime preservation boilers
40 CFR 60 Subpart IIII	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines	Applies
40 CFR 63 Subpart ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines	Applies

----- Compliance with applicable regulations is discussed in the following sections. -----

7. POLLUTANT EMISSIONS ESTIMATES & LIMITS:

A. Emission Standards & Permit Limits

All boiler burners will be rated as Low NOx (9 PPM or less) with flue gas recirculation. Best Available Control Technology (BACT) and offset requirements under District 209-A, Standards for Authority to Construct, § B.2, are not triggered because daily emissions of each pollutant will be limited to below the BACT and offset threshold of 250 lb/day. Compliance with emission limits will be enforced through hourly and daily emission limits; hourly, daily and annual fuel use limits; and a plant-wide NOx predictive emission monitoring system (PEMS). The specific manufacturers and models for the boilers are yet to be determined, but compliance with applicable requirements will be assured through the emissions limitations and the testing, monitoring, recordkeeping and reporting requirements specified in the attached Authorities to Construct (ATCs) 1604-00-11 and 1605-00-11.

The power plant emergency backup generators shall be powered by Tier 2, diesel-fueled, Caterpillar 3516C SCAC engines, 3,633 hp at 1,800 rpm, EPA Family ACPXL78.1T2E, CARB Executive Order U-R-001-0398-1, or equivalent CARB-certified engines that meet the current Tier standards for the given power range. The emergency fire pumps shall be powered by Tier 3, diesel-fueled, Cummins CFP7E-F30 engines, 200 hp at 2,100 rpm, EPA Family ACEXL-0409AAB, CARB Executive Order U-R-002-0516, or equivalent CARB-certified engines that meet the current Tier standards for the given power range. The engines will also be subject to the California Air Resources Board ATCM for Stationary Compression Ignition (CI) Engines in 17 CCR §93115. The engines will also meet the current Tier standards of 13 CCR, §2423 - Exhaust Emission Standards and Test Procedures: Heavy-Duty Off-Road Diesel Cycle Engines.

The limits in Table 7.A.1 were based on the estimated daily emissions in the revised Boiler Optimization tables. Specifically, the values came from the portion of Table 5.1B-12R titled,

"Maximum Daily Emissions, Auxiliary Boiler Cold Startup Day," because they represented the higher predicted daily emission rates than the "Maximum Hourly Emissions, Normal Boiler Operation."

Table 7.A-1: Power Plant Emission Limits per unit in pounds per hour (pounds per million Btu)

Pollutant	Auxiliary Boilers	Nighttime Preservation Boilers	Emergency Backup Engines	Emergency Fire Pump Engines
NOx as NO_2	2.74 (0.0110)	0.17 (0.0110)	38.4	1.3
CO	4.55 (0.0183)	0.55 (0.0366)	20.8	1.15
VOC as CH_4	1.34 (0.0054)	0.08 (0.0053)	1.3	0.08
$PM_{10}/PM_{2.5}$	1.25 (N/A)	0.08 (N/A)	1.2	0.07
SO_2	0.52 (0.0021)	0.03 (0.0021)	0.04	0.003

The Common Area emergency backup generator shall be powered by a Tier 3, diesel-fueled, Caterpillar C9 ATAAC, 398 hp at 1,800 rpm, EPA Family ACPXL08.8ESX, CARB Executive Order U-R-001-0373, or an equivalent CARB-certified engine that meets the current Tier standards for the given power range. The engines shall meet the limits specified in the application and Condition 8 of the attached ATC 1606-00-11.

Table 7.A-2: Common Area Emission Limits in pounds per hour

Pollutant	Emergency Backup Engine	Emergency Fire Pump Engine
NOx as NO_2	2.6	1.3
CO	2.28	1.15
VOC as CH_4	0.15	0.08
$PM_{10}/PM_{2.5}$	0.13	0.07
SO_2	0.004	0.003

The total plant-wide combined criteria pollutant emissions from the auxiliary and nighttime preservation boilers, emergency and fire pump engines shall not exceed the limits in Table 7.A-3.

Table 7.A-3: Criteria Pollutant Emission Limits in pounds per day

Pollutant	All Fuel Burning Equipment
NOx as NO_2	116.0
CO	156.1
VOC as CH_4	37.8
$PM_{10}/PM_{2.5}$	21.3
SO_2	7.4

The above Tables 7.A-1 and 7.A-2 list the emission rate limits proposed by the applicant and accepted by the District for the stationary sources of criteria pollutants. These emission rates were input into dispersion modeling to determine the worst-case short-term (maximum 1-, 3- and

8-hour) ambient impacts for each pollutant for which there is state and/or federal ambient standard. Rather than limit the operating hours of the individual boilers on a daily, monthly or annual basis, the District also accepted the application's estimated hours of operation. From the estimates, daily and annual natural gas fuel limits were derived in Table 5.1B - 9R of the revised Boiler Optimization tables that will act as surrogate emission control limits for ensuring the 24-hour and annual impacts will be below the state and/or federal ambient standard standards. The total natural gas fuel consumption, expressed as heat input rates, shall not exceed 3,440 MMBtu/day or 746,400 MMBtu/year for combustion in the burners of all auxiliary and nighttime preservation boilers in the Solar 1 facility and the adjacent Solar 2 facility.

Hours of operation of the diesel-fueled emergency backup and fire pump engines are limited by the requirements of the California Code of Regulations, Title 17 (17 CCR) § 93115 - Airborne Toxic Control Measure for Stationary Compression Ignition (CI) Engines.

B. Boiler Criteria Pollutant Emissions

Certified emissions from specific makes/models of the diesel engines were provided in the application materials and were accepted by the District (or other engines with equivalent or lesser emissions). The boilers will be required to meet low-NOx standards with a concentration of 9 parts per million on a dry volumetric basis (ppmvd, corrected to 3% O_2). The District performed calculations to ensure that the emissions stated in the application, though not accompanied by manufacturer data, were reasonably representative from an engineering standpoint. The following example calculations are for the NOx emission rate from the auxiliary boilers. The other criteria pollutants were also checked similarly for the auxiliary and nighttime preservation boilers. With a given concentration, exhaust flow rate is necessary to calculate the mass flow rate in pounds per hour (lb/hr).

Boiler Example Calculations:

EPA's Appendix F to 40 CFR Part 75 - Conversion Procedures provides an exhaust flow estimate for natural gas combustion of 8,710 dry standard cubic feet per million Btu (dscf/MMBtu). With the auxiliary boiler rated fuel combustion of 249 MMBtu per hour:

$$\text{exhaust flow} = \frac{36{,}146\ \text{dscf}}{\text{min}} = \frac{249\ \cancel{\text{MMBtu}}}{\text{hr}} \times \frac{8{,}710\ \text{dscf}}{\cancel{\text{MMBtu}}} \times \frac{\cancel{\text{hr}}}{60\ \text{min}}$$

The application listed the exhaust flow (Q) as 72,426 actual cubic feet per minute (acf/min), which is reasonable, although conservatively overestimating flow and emissions, after adjusting to dry standard conditions with temperature (300 °F) and moisture (16.3%):

$$\text{exhaust flow} = \frac{42{,}115\ \text{dscf}}{\text{min}} = \frac{72{,}426\ \text{acf}}{\text{min}} \times \frac{528\ \cancel{^{\circ}\text{R}}}{(460 + 300)\ \cancel{^{\circ}\text{R}}} \times (1 - 0.163)$$

$$\text{where,} \qquad Q_{std}\frac{\text{dscf}}{\text{min}} = Q\frac{\text{acf}}{\text{min}} \times \frac{T_{std}{}^{\circ}\text{R}}{T\ {}^{\circ}\text{R}} \times (1 - \%\ H_2O)$$

Then, calculating the auxiliary boiler NOx emission rate using the application's exhaust flow rate:

$$\text{NOx} = 9\ \cancel{\text{ppmvd}} \times \frac{10^{-6}}{\cancel{\text{ppmvd}}} \times \frac{46\ \cancel{\text{g}}}{\cancel{\text{g(mol)}}} \times \frac{2.596 \times 10^{-3}\ \text{lb}\cancel{\text{(mol)}}}{\cancel{\text{dscf}}} \times \frac{42{,}115\ \cancel{\text{dscf}}}{\cancel{\text{min}}} \times \frac{60\ \cancel{\text{min}}}{\text{hr}}$$
$$= 2.72\ \frac{\text{lb}}{\text{hr}}\ (\text{as}\ NO_2)$$

where the NO_2 molecuar weight $= 46$ and the conversion

$$\text{factor} = 2.596 \times 10^{-3}\ \frac{\text{lb(mol)}}{\text{dscf}} = \frac{\text{lb}}{453.6\ \cancel{\text{g}}} \times \frac{\cancel{\text{g}}\text{(mol)}}{22.414\ \cancel{\text{l}}} \times \frac{28.32\ \cancel{\text{l}}}{\text{dscf}} \times \frac{492.27\ ^{\circ}\cancel{\text{R}}}{528.27\ ^{\circ}\cancel{\text{R}}}$$

This result is essentially the same as the application's NOx emission rate of 2.74 lb hr.

C. Non-criteria Pollutant Emissions from Boilers

The District approves the use of the Ventura County APCD AB-2588 Combustion Emission Factors for Natural Gas Fired External Combustion Equipment to estimate boiler non-criteria pollutant emission rates. The document, published on May 17, 2001, is believed to be more reliable than the July 1998 EPA AP-42, Section 1.4 – Natural Gas Combustion. Table 7.C-1 below shows a summary of the Ventura County factors and the resulting emissions for each type of boiler.

Table 7.C-1: Boiler Non-Criteria Pollutants

	Ventura County AB-2588 Emission Factors (lb/MMcf)		Auxiliary Boiler	Nighttime Boiler
Pollutant	10-100 MMBtu/hr	>100 MMBtu/hr	249 MMBtu (lb/hr)	15 MMBtu (lb/hr)
propylene	5.30E-01	1.55E-02	3.79E-03	7.79E-03
HAPs				
acetaldehyde	3.10E-03	9.00E-04	2.20E-04	4.56E-05
Acrolein	2.70E-03	8.00E-04	1.95E-04	3.97E-05
Benzene	5.80E-03	1.70E-03	4.15E-04	8.53E-05
ethylbenzene	6.90E-03	2.00E-03	4.88E-04	1.01E-04
formaldehyde	1.23E-02	3.60E-03	8.79E-04	1.81E-04
Hexane	4.60E-03	1.30E-03	3.17E-04	6.76E-05
naphthalene	3.00E-04	3.00E-04	7.32E-05	4.41E-06
PAH's (excluding naphthalene)	1.00E-04	1.00E-04	2.44E-05	1.47E-06
Toluene	2.65E-02	7.80E-03	1.90E-03	3.90E-04
Xylenes	1.97E-02	5.80E-03	1.42E-03	2.90E-04

Total HAPs per boiler type (lb/hr):	5.93E-03	1.21E-03	
x 2 units each type (Solar 1 & 2):	1.19E-02	2.42E-03	= 1.43E-02 lb/hr
Annual HAPs with variable operating hours[1]:	7.17E-03	5.82E-03	= 1.30E-02 ton/yr

Example calculation for propylene from the auxiliary boiler with the Ventura County factor in pounds per million cubic feet of natural gas:

$$\text{emission rate} = 3.79 \times 10^{-3} \frac{\text{lb}}{\text{hr}} = \frac{1.553 \times 10^{-2} \text{ lb}}{\cancel{10^6}\ \cancel{\text{scf}}} \times \frac{249 \times \cancel{10^6}\ \cancel{\text{Btu}}}{\text{hr}} \times \frac{\cancel{\text{scf}}}{1{,}020\ \cancel{\text{Btu}}}$$

The total hazardous air pollutants (HAPs) are orders of magnitude below the major source thresholds of 25 tons per year (ton/yr) combined or 10 ton/yr per single HAP.

D. Emissions from Construction Activities

The District does not directly regulate mobile equipment that is associated with construction activities. Instead, it enforces District Rule 401 which requires reasonable precautions be taken to prevent visible particulate matter from being airborne, under normal wind conditions, beyond the property from which the emission originates. Condition 30 of the attached ATCs 1604-00-11 and 1605-00-11 state that the staff conditions of certification required by the CEC for construction fugitive dust control shall be deemed by the District to be reasonable precautions under Rule 401. The District accepts the calculation methodologies used in the application to estimate emissions from construction activities in order to assess the modeled ambient impacts and health risk. The approach and the values derived appear to be both comprehensive and accurate. The mitigated emissions will not cause exceedances of the state or federal Ambient Air Quality Standards.

8. COMPLIANCE WITH DISTRICT RULES

The general prohibitory rules in Regulation IV applicable to the project include the following:

Rule 400—Ringelmann Chart

Prohibits visible emissions as dark as, or darker than, Ringelmann No. 1 for periods greater than three minutes in any hour.

The use of natural gas in the boilers and good combustion tuning practices will minimize the possibility of any visible emission exceedance.

The proposed diesel fired emergency engines will be required to meet the highest available off-road EPA Tier engine rating standards, and to only burn California diesel fuel, not to

[1] Boiler Optimization revised tables: Table 5.1B-15R for the auxiliary boilers and Table 5.1B-16R for the nighttime preservation boilers.

exceed 15 ppm sulfur content. Along with proper operation, and maintenance, the visible emissions from these engines are not expected to exceed the visible emission standards.

Furthermore, pursuant to this rule, Permit conditions for all combustion equipment shall prohibit visible emissions exceedances.

Rule 402—Nuisance

Prohibits the discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

The Hidden Hills facility shall not emit odorous pollutants, and is expected to comply with this rule.

Rule 403—Breakdown

Defines breakdown conditions and describes procedures to be followed by the owner/operator and by the APCO in the event of occurrence of breakdown conditions.

Permit conditions shall set forth requirements for compliance with this rule.

Rule 404-A—Particulate Matter

Prohibits PM emissions in excess of the concentrations and emission rates shown in the rule.

The proposed PM emission limits for the boilers and engines will maintain PM emissions well below the limits of this rule.1604-00-11

Rule 404-B—Oxides of Nitrogen

Limits NOx emissions from combustion sources to 125 ppmvd @ 3% O_2.

The proposed NOx emission limits for the combustion equipment will maintain NOx emissions well below the limits of this rule:

Equipment	ppmvd @ 3% O_2
boilers	9
plant backup generator	119
common area backup generator	54
fire pump engines	21

Rule 416 – Sulfur Compounds and Nitrogen Oxides

Limits SO_2 and NOx emissions from any single source to 0.2% by volume and 140 lb/hr, respectively.

The use of natural gas fuel and the proposed NOx emissions limits for the boilers and engines will maintain SO_2 and NOx emissions well below the limits of this rule.

9. COMPLIANCE WITH BOILER NSPS

A. Emission Standards

By having a heat input capacity greater than 100 MMBtu/hr but less than 250 MMBtu/hr, the auxiliary boilers are subject to the requirements of 40 CFR 60 Subpart Db – New Source Performance Standards (NSPS) for Industrial-Commercial-Institutional Steam Generating Units. The emission limits in the NSPS that apply to the boilers, 0.20 lb/MMBtu of NOx [40 CFR §60.44b(a)] and 0.20 lb/MMBtu SO_2 [40 CFR §60.42b(k)], are less rigorous than the emissions limits based on the boiler technology and approved by the District in Condition10 of the attached ATCs 1604-00-11 and 1605-00-11.

The nighttime preservation boilers are subject to the requirements of 40 CFR 60 Subpart Dc – NSPS for Small Industrial-Commercial-Institutional Steam Generating Units. Because they will burn only natural gas, the boilers are not subject to the sulfur dioxide (SO_2) emission limit.

Because they will burn only natural gas, neither the auxiliary nor the nighttime boilers are subject to the particulate matter standards in their respective NSPS subparts. Testing, monitoring and recordkeeping will apply to all boilers.

B. Continuous NOx Predictive Emission Monitoring

Owners and operators of boilers greater than 250 MMBtu/hr heat input and subject to the NOx standard of this rule would have to demonstrate continuous compliance by use of a continuous emissions monitoring system (CEMS). Such a CEMS would be subject to all the requirements of 40 CFR 75. Because the auxiliary boilers are rated at 249 MMBtu/hr, the applicant has elected, under 40 CFR 60.48b(g), to use a continuous predictive emissions monitoring system (PEMS), specified in more detail in 40 CFR 60.49b(c) and §60.49b(g). During the required initial compliance testing, operating parameters will be monitored. The applicant is required to submit a PEMS plan detailing how these operating parameters will be monitored, recorded and utilized to continuously estimate NOx emissions with respect to the District permit limit. Condition 18 of the attached ATCs 1604-00-11 and 1605-00-11 specifies this requirement. The total combined NOx emissions from the auxiliary and nighttime preservation boilers, emergency and fire pump engines shall not exceed the limits in Table 7.A-3.

C. Initial Compliance Testing

In accordance with 40 CFR 60.45b, 60.46b and District Rule 108.2.b, initial testing for the all the boilers shall be performed in accordance with the methods specified in Condition19 of the attached ATCs 1604-00-11 and 1605-00-11, or other District-approved methods:

- PM_{10} emissions: EPA Method 5, Methods 201/202 or CARB Method 5
- NOx emissions: EPA Method 7, 7A, 7E
- SO_2 emissions: EPA Method 6, 6A, 6B or 6C
- CO emissions: EPA Method 10
- VOC emissions: EPA Method 25A

10. COMPLIANCE WITH CLEAN AIR ACT'S TITLE IV AND TITLE V

The auxiliary boilers, by providing steam to a steam turbine having a capacity greater than 25 megawatts of electrical output, trigger Title IV – Acid Deposition Control for this project. Title V permitting is thereby also required for the project. Requirements for these regulations will be addressed in separate Title V permits that will be submitted by the District to EPA Region 9.

11. PSD CONSIDERATIONS

For the purposes of Prevention of Significant Deterioration (PSD) applicability the three facilities, Solar 1, Solar 2 and Common Area, are combined though permitted separately.

- When combined, the two solar power plants' auxiliary boilers put the project into the first of the 28 listed categories, "Fossil fuel-fired steam electric plants of more than 250 million Btu/hr heat input." This makes the PSD major source threshold for any regulated pollutant 100 tons per year (ton/yr). The highest regulated pollutant from the combined facilities is CO at 12.9 ton/yr. As of July 1, 2011, there is an additional greenhouse gas major source threshold of 100,000 ton/yr CO_2 equivalent (CO_2e) emissions. The combined facilities' CO_2e, as revised in April 2012, is 44,394 ton/yr. The project is therefore not a PSD major source and is not subject to PSD review.

- The nearest Federal Class I Area boundary is the Domeland Wilderness 200 kilometers (km) to the west (double the 100 km distance at which a Class I area would have to be considered for visibility impacts). The closer Nopah Range Wilderness and Pahrump Valley Wilderness are not designated Class I areas.

12. DISPERSION MODELING

Dispersion modeling of the ambient impact of criteria pollutants was performed in AERMOD to determine whether the proposed facility would cause or contribute to an exceedance of any Ambient Air Quality Standard (AAQS). All the modeling input parameters appear to be consistent with accepted modeling guidelines.

Impacts from project construction were modeled separately because of the shorter-term duration estimated at 29 months. Each of the project's pollutant maximum impacts, when combined with its respective ambient background, was below the standards with the exception of the 24-hour state PM_{10} standard. (See discussion below)

Various operating conditions were used, including normal, startup and hot standby, to model pollutant maximum operating impacts against the state CAAQS and federal NAAQS. The highest resultant concentration was selected from the various operating modes for each pollutant and averaging period to represent the project's maximum impact. Each of the project's pollutant maximum impacts, when combined with its respective ambient background, was below the standards with the exception of the 24-hour state PM_{10} standard. (See discussion below)

The state 24-hour PM_{10} standard of 50 $\mu g/m^3$ is exceeded by the highest 24-hour background concentration alone of 96 $\mu g/m^3$. This highest PM_{10} background concentration is not likely to occur at the same time as the highest project PM_{10} impact because of the dust mitigation permit conditions.

13. SCREENING HEALTH RISK ANALYSIS

By making use of the CARB/OEHHA-approved Hotspots Analysis and Reporting Program (HARP) (Version 1.4d) and the modeled maximum project impacts of each toxic non-criteria pollutant, the screening health risk analysis was conducted in accordance with the OEHHA's "Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments." This methodology is conservative by design and yet the cancer risk at the point of maximum impact on the facility's fence line was only 2.8 per million. At the nearest residential receptor, it was 0.5 per million. The acute and chronic hazard indices of 0.003 and 0.001, respectively, are orders of magnitude below the significance level of 1.0. These low results are to be expected because there are very low toxic emissions from natural gas combustion in the boilers and the most toxic substance is diesel particulate matter from the emergency backup and fire pump engines, which have very limited hours of operation.

14. CEQA COMPLIANCE/CEC REVIEW

Rule 209-A.E. establishes a procedure for coordinating GBUAPCD review of power plant projects with the California Energy Commission (CEC)'s environmental review process. Under this rule, the GBUAPCD reviews the Application for Certification (AFC) that is submitted to the CEC and conducts a Determination of Compliance review that is identical to that which would have been performed if an application for authority to construct had been received for the project. This Preliminary Determination of Compliance (PDOC) is the preliminary decision under Subsection B(1) of Rule 205. A Final Determination of Compliance shall be issued only after the PDOC is subjected to the public notice and comment requirements of Subsections B(2) through B(6) of Rule 205.*

The CEC has the statutory responsibility for licensing thermal power plants 50 megawatts and larger and the plants' related facilities (such as transmission lines, fuel supply lines, water pipelines, etc). The Commission's siting process has been determined to be a certified regulatory program under the California Environmental Quality Act (CEQA) and the functional equivalent of preparing environmental impact reports. The Final Determination of Compliance shall be considered a District Authority to Construct for each of the facilities upon certification of the Project by the CEC.

* Rule 209A.E contains an outdated reference to Subsection G(2) of Rule 209A, which does not exist. The correct reference is to Subsection B of Rule 205.

15. COMPLIANCE (PERMIT CONDITIONS):
Compliance with these regulations will be ensured by enforcement of the conditions in the District Authorities to Construct (Appendices A and B), which will be incorporated into the final District Permits to Operate.

APPENDIX A: ATCs 1604-00-11 and 1605-00-11
Solar 1 and Solar 2 (identical ATCs, only equipment ID numbers differ)

REGULATED EQUIPMENT: 250 Megawatt Solar Power Plant with the following equipment:

ID №	Function	Make & Model	Serial Number	Fuel Type	Fuel Use
B1A	Auxiliary Boiler	TBD	TBD	Natural Gas	249 MMBtu/hr
B2A	Nighttime Preservation Boiler	TBD	TBD	Natural Gas	15 MMBtu/hr
EG1A	Backup Generator	Tier 2, Caterpillar 3516C, 3633 hp (or equivalent)	TBD	CARB Diesel	24 MMBtu/hr
FP1A	Fire Pump Engine	Tier 3, Cummins CFP7E-F30, 200 hp (or equivalent)	TBD	CARB Diesel	2 MMBtu/hr
				Total	**290 MMBtu/hr**

ANCILLARY EQUIPMENT: A heliostat array with about 90,000 heliostats, a power block containing a Rankine-cycle non-reheat steam turbine, a solar receiver steam generator atop a 750-foot tower, feed water heaters, a deaerator, an air-cooled condenser, wet surface air cooler (with high efficiency drift eliminator), oil-water separator and diesel fuel aboveground storage tanks.

EMISSIONS CONTROL: Low NOx (9 PPM) boiler burners with flue gas recirculation, annual and daily NOx emission limits, hours of operation limits, and a plantwide NOx emission monitoring system.

CONDITIONS: This ATC is subject to the attached approval conditions.

COMMENCEMENT OF CONSTRUCTION: The permittee shall not begin actual on-site construction of the equipment authorized by this Authority to Construct until the lead agency satisfies the requirements of the California Environmental Quality Act (CEQA).

A PERMIT TO OPERATE the above equipment shall be issued only after an inspection to determine if the equipment has been constructed according to the approved plans and specifications and the equipment can be operated in compliance with all Rules and Regulations of the Great Basin Unified Air Pollution Control District. Notify the District at (760) 872-8211 when construction is complete and the equipment is ready for operation.

GENERAL CONDITIONS

1. **Facility Startup**
   The permittee shall notify the District in writing when construction is complete and the equipment is ready for commissioning operations. Operation of this equipment shall be conducted in accordance with all data and specifications submitted with the application under which this ATC is issued unless otherwise noted. Notification shall be given to the District office by email, Postal Service delivery or telephone facsimile transmission at least 72 hours prior to equipment start-up. Operation of this equipment without a written Permit to Operate is a violation of District Rule 200 B, and can result in civil and criminal penalties under California Health & Safety Code (H&SC) § 42400.

2. **Commissioning Period under Temporary Permit to Operate:**
   Following a District inspection verifying that the facility is constructed in a manner consistent with the specifications in the application and with this Authority to Construct, a

temporary Permit to Operate (TPO) shall be issued. The TPO shall be valid for the duration of the commissioning period defined below and until a Permit to Operate is issued or denied.

A. Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable steady state operation of the boilers and associated control systems.

B. The commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a boiler is first fired, whichever occurs first. The commissioning period shall terminate when the plant has completed initial source testing, completed final plant tuning, and is available for commercial operation.

C. During the commissioning period, the owner or operator shall keep records of the natural gas fuel combusted in the boilers on hourly and daily basis. The natural gas fuel combusted during the commissioning period shall accrue towards the annual fuel use limit.

3. Right-of-Entry

The "Right of Entry", as defined by California H&SC § 41510 of Division 26, shall apply at all times with respect to the equipment and the Control System. Representatives of the Great Basin Unified Air Pollution Control District shall be permitted to enter the facility to inspect and copy any record required to be kept under the terms of this permit. District staff shall also be permitted to inspect any equipment, work practices, air emission-related activity or method dictated by this permit. If deemed necessary by the District to verify compliance with these conditions, the permittee shall within 7 days notice be available to open any sample extraction port, or exhaust outlet for the purpose of conducting source tests or to collect samples. In enforcing the terms of this permit, any cost incurred in collecting samples, source testing and laboratory analysis fees shall be the responsibility of the applicant. [District Rules 210 and 302 Analysis Fee]

4. Copy of Permit Onsite

A copy of the permit shall be maintained readily available at all times on the operating premises. [District Rule 200.D]

5. Report Violation of Emission Standard

Any violation of any emission standard to which the stationary source is required to comply, as indicated by the records of the monitoring device, shall be reported by the operator of the source to the district within 96 hours after such occurrence. The district shall, in turn, report the violation to the state board within five working days after receiving the report of the violation from the operator. [Cal H&S § 42706]

6. Severability Clause

If any provision of this permit is found invalid, such finding shall not affect any remaining provisions. [District Rule 107]

7. Right to Revise Permit

The provisions of this permit may be modified by the District if it determines the stipulated conditions are inadequate. [District Rule 210.C]

8. Breakdown (or Emergency) Reporting Conditions

A breakdown condition means an unforeseeable failure or malfunction of: 1) any air pollution control equipment or related operating equipment which causes a violation of any emission limitation or restriction prescribed by this permit or District rules and regulations, or by State law, or 2) any in-stack continuous monitoring equipment.

A. The permittee shall comply with the breakdown requirements of District Rule 403 (Breakdown), which shall include notifying the Air Pollution Control Officer of a breakdown condition within an hour of detection, unless it can be demonstrated that a longer reporting period is necessary -- not to exceed two (2) days.

B. Notification shall identify the time, location, equipment involved, and to the extent possible the cause of the breakdown and steps taken to correct the breakdown condition.

C. Within one (1) week after the breakdown occurrence, the permittee shall submit a written report to the Air Pollution Control Officer which includes: date of correction of the breakdown, determination of the cause of the breakdown, corrective measures to prevent a recurrence, an estimate of the emissions caused by the breakdown condition, and pictures of the failed equipment, if available.

D. Breakdown conditions shall not persist longer than 24 hours or the end of the production run, whichever is sooner, except for continuous monitoring equipment, for which the period shall be ninety-six (96) hours, unless the permittee obtains an Emergency Variance pursuant to District Rule 617. [District Rule 403]

FACILITY OPERATING CONDITIONS

9. Visible Emissions Opacity Limit

Visible emissions from any source shall not exceed a Ringelmann 1 (20% opacity) for a period or periods aggregating more than three minutes in any one hour. [District Rule 400]

10. Unit Emission Limits

To demonstrate consistency with the ambient air quality modeling and the screening health risk assessment provided in the application for certification to the California Energy Commission, the pound per hour equipment emission rate limits in Table 1 shall apply. Except during the commissioning period, startup/shutdown conditions and standby conditions, the pound per million Btu limits shall also apply. Compliance with these lb/MMBtu limits will also ensure compliance with the limits in the applicable New Source Performance Standards (NSPS).

Table 1: Criteria pollutant emission limits per unit in pounds per hour (pounds per million Btu)

Pollutant	Auxiliary Boiler	Nighttime Preservation Boiler	Emergency Backup Engine	Emergency Fire Pump Engine
NOx as NO_2	2.74 (0.0110)	0.17 (0.0110)	38.4	1.3
CO	4.55 (0.0183)	0.55 (0.0366)	20.8	1.15

VOC as CH_4	1.34 (0.0054)	0.08 (0.0053)	1.3	0.08
$PM_{10}/PM_{2.5}$	1.25 (N/A)	0.08 (N/A)	1.2	0.07
SO_2	0.52 (0.0021)	0.03 (0.0021)	0.04	0.003

11. Combined Plant-wide Daily Emission Limits

A. "Plant-wide" shall mean this Solar 1 Power Plant facility, GBUAPCD № 1604-00-11, plus the adjacent Solar 2 Power Plant and Common Area facilities (permitted separately, GBUAPCD № 1605-00-11 and 1606-00-11, respectively).

B. The total plant-wide combined emissions from the auxiliary and nighttime preservation boilers, emergency and fire pump engines shall not exceed the limits in Table 2.

Table 2: Criteria pollutant emission limits in pounds per day

Pollutant	All Fuel Burning Equipment
NOx as NO_2	116.0
CO	156.1
VOC as CH_4	37.8
$PM_{10}/PM_{2.5}$	21.3
SO_2	7.4

C. Compliance demonstration with these plant-wide limits shall entail the monitoring, recordkeeping and reporting requirements specified later in this permit.

D. Compliance with the NOx limit shall be demonstrated via the use of a plant-wide NOx Predictive Emission Monitoring System (PEMS), in accordance with Condition 18, that totals both power plants' boiler emission rates.

12. Boiler Fuel Use Limits

The total natural gas fuel consumption, expressed as heat input rates, shall not exceed 3,440 MMBtu/day or 746,400 MMBtu/year for combustion in the burners of all auxiliary and nighttime preservation boilers in the Solar 1 facility plus the adjacent Solar 2 facility (permitted separately, GBUAPCD № 1605-05-11).

13. Toxic Hot Spots Program (AB 2588)

In lieu of an emissions inventory plan, the District accepts the screening health risk assessment provided in the application for certification to the California Energy Commission. The combined Solar 1 and Solar 2 facilities shall be categorized under AB 2588 as "Intermediate Level" and shall meet the reporting requirements under Section V of the Emission Inventory Criteria and Guidelines for the Air Toxics "Hot Spots" Program.

BOILER SPECIFICATIONS AND NSPS STANDARDS

14. Boiler Specifications

Each 249 MMBtu/hr auxiliary boiler (Unit B1A) and each 15 MMBtu/hr nighttime preservation boiler (Unit B2A) shall be equipped with low-NOx burners, 9 ppmvd NOx at

3% O_2 or less at loads exceeding 25% maximum continuous rating (MCR), and flue gas recirculation (FGR). The boilers shall meet all specifications stated in the permit application, including stack dimensions and pollutant emission rates.

15. New Source Performance Standards (NSPS) for Auxiliary Boiler

Each auxiliary boiler shall comply with the requirements of 40 CFR 60 Subpart Db – NSPS for Industrial-Commercial-Institutional Steam Generating Units. The boiler shall meet the following emission standards at all times except during periods of startup, shutdown, or malfunction:

- NOx: 0.20 lb/MMBtu (30-day average) [40 CFR §60.44b(a)]
- SO_2: 0.20 lb/MMBtu [40 CFR §60.42b(k)]

16. New Source Performance Standards (NSPS) for Nighttime Preservation Boiler

Each nighttime preservation boiler shall comply with the requirements of 40 CFR 60 Subpart Dc – NSPS for Small Industrial-Commercial-Institutional Steam Generating Units. The SO_2 emission limit in this subpart does not apply because the unit is rated below 30 MMBtu/hr.

BOILER MONITORING CONDITIONS

17. Fuel Type and Flow Monitoring

A. The burners for the auxiliary and nighttime preservation boilers shall be fueled with natural gas that meets the standards of the California Public Utilities Commission (CPUC).

B. Each boiler shall be equipped with a continuous flow monitoring system to measure and record fuel consumption in million standard cubic feet per hour (MMscf/hr).

18. Boiler Predictive NOx Emission Rate Monitoring Plan

A. As an element of the PEMS required by Condition 11.D, the permittee shall estimate the boiler emissions by continuously monitoring parameters indicative of emissions and maintaining records of the amount of natural gas combusted. The permittee shall monitor the boiler operating conditions and predict NOx emission rates as specified in a plan that shall:

(1) Be submitted to the District within 360 days of initial startup in accordance with 40 CFR Subpart Db §60.49b(c) and §60.49b(g);

(2) Identify the specific operating conditions to be monitored and the relationship between these operating conditions and NOx emission rates (i.e., lb/MMBtu heat input). Steam generating unit operating conditions include, but are not limited to, the degree of staged combustion (i.e., the ratio of primary air to secondary and/or tertiary air) and the level of excess air (i.e., flue gas O_2 level);

(3) Include the data and information that the permittee used to identify the relationship between NOx emission rates and these operating conditions; and

(4) Identify how these operating conditions, including steam generating unit load, will be monitored on an hourly basis by the permittee during the period of operation of the

affected facility; the quality assurance procedures or practices that will be employed to ensure that the data generated by monitoring these operating conditions will be representative and accurate; and the type and format of the records of these operating conditions, including steam generating unit load, that will be maintained by the permittee under 40 CFR §60.49b(g). [40 CFR Subpart Db §60.48b(d)]

B. If the permittee elects to estimate NOx emissions from the Nighttime Preservation Boilers using the pound per hour emission limit in Table 1, then the Plan may require continuous monitoring of only operating hours and fuel use for the Nighttime Preservation Boilers.

BOILER TESTING CONDITIONS

19. Initial Boiler Testing

Initial performance testing shall be completed on each auxiliary and nighttime preservation boiler to demonstrate compliance with the emission limits specified in Condition 10 at each boiler's maximum achievable production rate.

A. The initial performance test is to be scheduled within 60 days after achieving the maximum continuous rating (MCR) at which the affected facility will be operated, but not later than 180 days after initial startup of the facility. [§60.45b and 60.46b]

B. The permittee shall provide safe and accessible sampling ports that comply with California Industrial Safety Orders and Uniform Building Code and 40 CFR 60, Appendix A, Test Method 1.

C. A test protocol must be submitted to the Air Pollution Control District not later than 30 days before the proposed test date. This test protocol shall be approved by the District before testing begins and shall include the following, or other District-approved methods:

(5) PM_{10} emissions: EPA Method 5, Methods 201/202 or CARB Method 5

(6) NOx emissions: EPA Method 7, 7A, 7E

(7) SO_2 emissions: EPA Method 6, 6A, 6B or 6C

(8) CO emissions: EPA Method 10

(9) VOC emissions: EPA Method 25A

D. A copy of the test results shall be submitted to the District within 60 days following test completion. [District Rule 200.C, and Cal H&S Code § 44340]

DIESEL BACKUP GENERATOR AND FIRE PUMP ENGINE CONDITIONS

20. Emergency Backup Generator Engine

Each emergency backup generator shall be powered by a Tier 2, diesel-fueled, Caterpillar 3516C SCAC, 3,633 hp at 1,800 rpm, EPA Family ACPXL78.1T2E, CARB Executive Order U-R-001-0398-1, or an equivalent CARB-certified engine that meets the current EPA Tier standards for the given power range.

21. Emergency Fire Pump Engine

Each emergency fire pump shall be powered by a Tier 3, diesel-fueled, Cummins CFP7E-F30, 200 hp at 2,100 rpm, EPA Family ACEXL0409AAB, CARB Executive Order U-R-002-0516, or an equivalent CARB-certified engine that meets the current EPA Tier standards for the given power range.

22. Airborne Toxics Control Measure

The permittee shall operate the diesel emergency backup generator and fire pump engines in compliance with the California Code of Regulations, Title 17 (17 CCR) § 93115.

23. Particulate Matter Limit

Each emergency engine shall not discharge into the atmosphere particulate matter in excess of 0.3 grains per dry standard cubic foot of exhaust gas. [Rule 404-A].

24. CARB Diesel Fuel

Each engine shall be fueled with CARB diesel fuel with 15 parts-per-million sulfur content by weight or less, or an alternative diesel fuel that meets the requirements of the Standard of Motor Vehicle Fuel found in Title 13, CCR (13 CCR) § 2281. The amount of sulfur dioxide exhausted to the atmosphere shall not exceed 0.2% by volume. The permittee shall keep records of the composition of purchased fuel. [District Rules 210 and 416; 17 CCR § 93115.5(a)(1)]

25. Hour Meter Required

A non-resettable totalizer elapsed time meter shall be installed and maintained on each engine to indicate the cumulative hours of engine operation. [District Rule 210.A, 17 CCR § 93115].

26. Non-Emergency Use Limitation

A. Each emergency backup generator engine shall be allowed to operate up to 50 hours per year for maintenance and testing purposes. Operation of the engine beyond the 50 hours shall be allowed only by the events as defined in Condition 27 for what constitutes emergency use. [District Rule 210.A, 17 CCR § 93115.6(a)(3)(A)].

B. Each fire pump engine shall not operate more than the number of hours (up to 30 hours per year) necessary to comply with the testing requirements of the National Fire Protection Association (NFPA). [District Rule 210.A, 17 CCR § 93115.6(a)(4)(A)].

27. What Constitutes Emergency Use

Emergency use of the engines is not limited and is defined in 17 CCR § 93115 as providing electrical power or mechanical work during any of the following events and subject to the following conditions that:

A. the failure or loss of all or part of normal electrical power service or normal natural gas supply to the facility:

(1) which is caused by any reason other than the enforcement of a contractual obligation the permittee has with a third party or any other party; and

(2) which is demonstrated by the permittee to the district APCO's satisfaction to have been beyond the reasonable control of the owner or operator;

B. the failure of a facility's internal power distribution system:

(1) which is caused by any reason other than the enforcement of a contractual obligation the permittee has with a third party or any other party; and

(2) which is demonstrated by the permittee to the district APCO's satisfaction to have been beyond the reasonable control of the owner or operator.

C. the pumping of water for fire suppression or protection;

D. the pumping of water to maintain pressure in the water distribution system for the following reasons:

(1) a pipe break that substantially reduced water pressure; or

(2) high demand on the water supply system due to high use of water for fire suppression; or

(3) the breakdown of electric-powered pumping equipment at sewage treatment facilities or water delivery facilities.

[District Rule 210.A, 17 CCR § 93115].

28. Required Records for Emergency Engines

The permittee shall keep a monthly log of usage that shall list and document the nature of use for each of the following:

A. emergency use hours of operation;

B. maintenance and testing hours of operation;

C. hours of operation for emission testing to show compliance with the applicable standard;

D. initial start-up testing hours;

E. hours of operation for all uses other than those specified above; and

F. the fuel used.

(1) For engines operated exclusively on CARB Diesel Fuel, the owner or operator shall document the use of CARB Diesel Fuel through the retention of fuel purchase records indicating that the only fuel purchased for supply to an emergency standby engine was CARB Diesel Fuel; or

(2) For engines operated on any fuel other than CARB Diesel Fuel, fuel records demonstrating that the only fuel purchased and added to an emergency standby engine or engines, or to any fuel tank directly attached to an emergency standby engine or engines, meets the requirements of section 93115.5(b).

[District Rule 210.A, 17 CCR § 93115.10(g)(1)].

29. Record Retention

Log entries shall be retained for a minimum of 36 months from the date of entry. Log entries made within 24 months of the most recent entry shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request. Log entries made from 25 to 36 months from most recent entry shall be made

available to District staff within 5 working days from request. [Rule 210.A, 17 CCR § 93115.10(g)(2)].

PARTICULATE MATTER MITIGATION CONDITIONS

30. Fugitive Dust Mitigation

The permittee shall take reasonable precautions during construction activities to prevent visible particulate matter from being airborne, under normal wind conditions, beyond the HHSEGS property line, in accordance with the requirements for dust control in Rule 401.A. The District deems the California Energy Commission (CEC) staff conditions of certification (HHSEGS) AQ-SC1 through AQ-SC5 for construction and operation mitigation methods to be reasonable precautions under Rule 401. The permittee shall submit the Air Quality Construction Mitigation Plan, required by AQ-SC2 to the District after its approval by the CEC. The permittee shall make available to the District, upon request, copies of the CEC-required Monthly Compliance Report containing documentation of the actions taken to comply with these conditions.

FACILITY RECORDKEEPING & REPORTING CONDITIONS

31. Natural Gas Heat Input Records

Records for demonstrating compliance with the plant-wide natural gas combustion heat input, required by Condition 12, shall be presented in MMBtu/day, MMBtu/month and MMBtu per rolling 12-month period.

32. Plant-wide Emission Records

Emission records for the plant-wide NOx PEMS, required by Condition 11, shall be presented in pounds per hour (lb/hr), pounds per day (lb/day) and pounds per million Btu (lb/MMBtu) for each individual boiler in the Solar 1 and Solar 2 facilities. The sum total of NOx for all boilers shall be presented in pounds per day (lb/day) for each calendar day, midnight to midnight.

Data obtained to estimate boiler NOx emissions shall be presented as specified in the plant-wide NOx PEMS plan required by Condition 18.

33. Monitoring Record Retention

Required recordkeeping information shall be retained by the permittee in a form suitable for inspection for a period of at least two (2) years from the end of the calendar year of the journal entry. [Rule 206.B, Cal H&S Code § 42705]

34. Reporting of Monitoring Records

All monitoring records shall be made immediately available to the District staff upon request.

APPENDIX B: ATC 1606-00-11, Common Area

REGULATED EQUIPMENT:

ID №	Function	Make & Model	Serial Number	Fuel Type	Fuel Use
EG1C	Backup Generator	Tier 3, Caterpillar C9 ATAAC, 398 hp (or equivalent)	TBD	CARB Diesel	2.7 MMBtu/hr
FP1C	Fire Pump Engine	Tier 3, Cummins CFP7E-F30, 200 hp (or equivalent)	TBD	CARB Diesel	1.6 MMBtu/hr
				Total	**4.3 MMBtu/hr**

ANCILLARY EQUIPMENT: An administration, warehouse, and maintenance complex, and an onsite switchyard for the Hidden Hills Solar 1 and Hidden Hills Solar 2 power plants (permitted separately, GBUAPCD № 1604-00-11 and 1605-00-11, respectively).

EMISSIONS CONTROL: The two diesel-fueled engines are Tier 3 and are compliant with the California Air Resources Board ATCM for Stationary Compression Ignition Engines, CCR § 93115. The two engines' non-emergency hours of operation shall be limited.

CONDITIONS: This ATC is subject to the attached approval conditions.

COMMENCEMENT OF CONSTRUCTION: The permittee shall not begin actual on-site construction of the equipment authorized by this Authority to Construct until the lead agency satisfies the requirements of the California Environmental Quality Act (CEQA).

A PERMIT TO OPERATE the above equipment shall be issued only after an inspection to determine if the equipment has been constructed according to the approved plans and specifications and the equipment can be operated in compliance with all Rules and Regulations of the Great Basin Unified Air Pollution Control District. Notify the District at (760) 872-8211 when construction is complete and the equipment is ready for operation.

GENERAL CONDITIONS

1. **Facility Startup**
   The permittee shall notify the District in writing when construction is complete and the equipment is ready for commissioning operations. Operation of this equipment shall be conducted in accordance with all data and specifications submitted with the application under which this ATC is issued unless otherwise noted. Notification shall be given to the District office by email, Postal Service delivery or telephone facsimile transmission at least 72 hours prior to equipment start-up. Operation of this equipment without a written Permit to Operate is a violation of District Rule 200 B, and can result in civil and criminal penalties under California Health & Safety Code (H&SC) § 42400.

2. **Right-of-Entry**
   The "Right of Entry", as defined by California H&SC § 41510 of Division 26, shall apply at all times with respect to the equipment and the Control System. Representatives of the Great Basin Unified Air Pollution Control District shall be permitted to enter the facility to inspect and copy any record required to be kept under the terms of this permit. District staff shall also be permitted to inspect any equipment, work practices, air emission-related activity or method dictated by this permit. If deemed necessary by the District to verify compliance with these conditions, the permittee shall within 7 days notice be available to open any sample extraction port, or exhaust outlet for the purpose of conducting source tests or to

collect samples. In enforcing the terms of this permit, any cost incurred in collecting samples, source testing and laboratory analysis fees shall be the responsibility of the applicant. [District Rules 210 and 302 Analysis Fee]

3. **Copy of Permit Onsite**
   A copy of the permit shall be maintained readily available at all times on the operating premises. [District Rule 200.D]

4. **Report Violation of Emission Standard**
   Any violation of any emission standard to which the stationary source is required to comply, as indicated by the records of the monitoring device, shall be reported by the operator of the source to the district within 96 hours after such occurrence. The district shall, in turn, report the violation to the state board within five working days after receiving the report of the violation from the operator. [Cal H&S § 42706]

5. **Severability Clause**
   If any provision of this permit is found invalid, such finding shall not affect any remaining provisions. [District Rule 107]

6. **Right to Revise Permit**
   The provisions of this permit may be modified by the District if it determines the stipulated conditions are inadequate. [District Rule 210.C]

7. **Breakdown (or Emergency) Reporting Conditions**
   A breakdown condition means an unforeseeable failure or malfunction of: 1) any air pollution control equipment or related operating equipment which causes a violation of any emission limitation or restriction prescribed by this permit or District rules and regulations, or by State law, or 2) any in-stack continuous monitoring equipment.

   A. The permittee shall comply with the breakdown requirements of District Rule 403 (Breakdown), which shall include notifying the Air Pollution Control Officer of a breakdown condition within an hour of detection, unless it can be demonstrated that a longer reporting period is necessary -- not to exceed two (2) days.
   B. Notification shall identify the time, location, equipment involved, and to the extent possible the cause of the breakdown and steps taken to correct the breakdown condition.
   C. Within one (1) week after the breakdown occurrence, the permittee shall submit a written report to the Air Pollution Control Officer which includes: date of correction of the breakdown, determination of the cause of the breakdown, corrective measures to prevent a recurrence, an estimate of the emissions caused by the breakdown condition, and pictures of the failed equipment, if available.
   D. Breakdown conditions shall not persist longer than 24 hours or the end of the production run, whichever is sooner, except for continuous monitoring equipment, for which the period shall be ninety-six (96) hours, unless the permittee obtains an Emergency Variance pursuant to District Rule 617. [District Rule 403]

APPENDIX B: ATC 1606-00-11, Common Area

FACILITY OPERATING CONDITIONS

8. Unit Emission Limits

To demonstrate consistency with the ambient air quality modeling and the screening health risk assessment provided in the application for certification to the California Energy Commission, the pound per hour equipment emission rate limits in Table 1 shall apply.

Table 1: Common Area Emission Limits in pounds per hour

Pollutant	Emergency Backup Engines	Emergency Fire Pump Engines
NOx as NO_2	2.6	1.3
CO	2.28	1.15
VOC as CH_4	0.15	0.08
$PM_{10}/PM_{2.5}$	0.13	0.07
SO_2	0.004	0.003

DIESEL BACKUP GENERATOR AND FIRE PUMP ENGINE CONDITIONS

9. Visible Emissions Opacity Limit

Visible emissions from each engine shall not exceed a Ringelmann 1 (20% opacity) for a period or periods aggregating more than three minutes in any one hour. [District Rule 400]

10. Emergency Backup Generator Engine

The emergency backup generator (Unit EG1C) shall be powered by a Tier 3, diesel-fueled, Caterpillar C9 ATAAC, 398 hp at 1,800 rpm, EPA Family ACPXL08.8ESX, CARB Executive Order U-R-001-0373, or an equivalent CARB-certified engine that meets the current EPA Tier standards for the given power range.

11. Emergency Fire Pump Engine

The emergency fire pump (Unit FP1C) shall be powered by a Tier 3, diesel-fueled, Cummins CFP7E-F30, 200 hp at 2,100 rpm, EPA Family ACEXL0409AAB, CARB Executive Order U-R-002-0516, or an equivalent CARB-certified engine that meets the current EPA Tier standards for the given power range.

12. Airborne Toxics Control Measure

The permittee shall operate the diesel emergency backup generator and fire pump engines in compliance with the California Code of Regulations, Title 17 (17 CCR) § 93115.

13. Particulate Matter Limit

Each emergency engine shall not discharge into the atmosphere particulate matter in excess of 0.3 grains per dry standard cubic foot of exhaust gas. [Rule 404-A].

14. CARB Diesel Fuel

Each engine shall be fueled with CARB diesel fuel with 15 parts-per-million sulfur content by weight or less, or an alternative diesel fuel that meets the requirements of the Standard of

Motor Vehicle Fuel found in Title 13, CCR (13 CCR) § 2281. The amount of sulfur dioxide exhausted to the atmosphere shall not exceed 0.2% by volume. The permittee shall keep records of the composition of purchased fuel. [District Rules 210 and 416; 17 CCR § 93115.5(a)(1)]

15. Hour Meter Required

A non-resettable totalizer elapsed time meter shall be installed and maintained on each engine to indicate the cumulative hours of engine operation. [District Rule 210.A, 17 CCR § 93115].

16. Non-Emergency Use Limitation

A. The emergency backup generator engine shall be allowed to operate up to 50 hours per year for maintenance and testing purposes. Operation of the engine beyond the 50 hours shall be allowed only by the events as defined in Condition 16 for what constitutes emergency use. [District Rule 210.A, 17 CCR § 93115.6(a)(3)(A)].

B. The fire pump engine shall not operate more than the number of hours (up to 30 hours per year) necessary to comply with the testing requirements of the National Fire Protection Association (NFPA). [District Rule 210.A, 17 CCR § 93115.6(a)(4)(A)].

17. What Constitutes Emergency Use

Emergency use of the engines is not limited and is defined in 17 CCR § 93115 as providing electrical power or mechanical work during any of the following events and subject to the following conditions that:

A. the failure or loss of all or part of normal electrical power service or normal natural gas supply to the facility:

(3) which is caused by any reason other than the enforcement of a contractual obligation the permittee has with a third party or any other party; and

(4) which is demonstrated by the permittee to the district APCO's satisfaction to have been beyond the reasonable control of the owner or operator;

B. the failure of a facility's internal power distribution system:

(3) which is caused by any reason other than the enforcement of a contractual obligation the permittee has with a third party or any other party; and

(4) which is demonstrated by the permittee to the district APCO's satisfaction to have been beyond the reasonable control of the owner or operator;

C. the pumping of water for fire suppression or protection;

D. the pumping of water to maintain pressure in the water distribution system for the following reasons:

(1) a pipe break that substantially reduces water pressure; or

(2) high demand on the water supply system due to high use of water for fire suppression; or

(3) the breakdown of electric-powered pumping equipment at sewage treatment facilities or water delivery facilities.

[District Rule 210.A, 17 CCR § 93115].

18. Required Records for Emergency Engines

The permittee shall keep a monthly log of usage that shall list and document the nature of use for each of the following:

A. emergency use hours of operation;

B. maintenance and testing hours of operation;

C. hours of operation for emission testing to show compliance with the applicable standard;

D. initial start-up testing hours;

E. hours of operation for all uses other than those specified above; and

F. the fuel used.

(1) For engines operated exclusively on CARB Diesel Fuel, the owner or operator shall document the use of CARB Diesel Fuel through the retention of fuel purchase records indicating that the only fuel purchased for supply to an emergency standby engine was CARB Diesel Fuel; or

(2) For engines operated on any fuel other than CARB Diesel Fuel, fuel records demonstrating that the only fuel purchased and added to an emergency standby engine or engines, or to any fuel tank directly attached to an emergency standby engine or engines, meets the requirements of section 93115.5(b).

[District Rule 210.A, 17 CCR § 93115.10(g)(1)].

19. Record Retention

Log entries shall be retained for a minimum of 36 months from the date of entry. Log entries made within 24 months of the most recent entry shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request. Log entries made from 25 to 36 months from most recent entry shall be made available to District staff within 5 working days from request. [Rule 210.A, 17 CCR § 93115.10(g)(2)].

APPENDIX C: Responses to the Air Quality section of Cindy MacDonald's Preliminary Public Comments, Technical Analysis & Recommendations (Pages 1-35), Posted March 29, 2012 and Submitted directly to the Great Basin Unified Air Pollution Control District on April 12, 2012.

1. AIR EMISSIONS LIMITATIONS

Question 1.1: Where are the discussions specific to limitations and restrictions regarding the use of the boilers via air emissions?

Response: The applicant included proposed emissions and fuel use limitations in the application. The District will ensure compliance with the proposed limitations through hourly and daily emission limits; hourly, daily and annual fuel use limits; and a plant-wide NOx predictive emission monitoring system (PEMS). The District has included conditions in the draft Authorities to Construct that will impose these limitations and require testing, monitoring, recordkeeping and reporting requirements. Please see Section 7 of the District engineering evaluation and Conditions 10, 11, 12, 17, 18 and 19 of the draft ATC for the boilers. These conditions will also be included in the CEC license, should the project be approved by the CEC.

Question 1.2: Who is responsible for monitoring and enforcing these limitations and restrictions and how will this be accomplished in this remote area?

Response: The District will have primary authority for monitoring compliance with permit conditions. In addition, the CEC will have a Compliance Project Manager (CPM) who will be responsible for overseeing compliance with all conditions of the CEC license, including air quality conditions. As indicated in the response to Question 1.1, the Authorities to Construct (and the CEC license) will include testing, monitoring, recordkeeping and reporting requirements to demonstrate compliance with the permit requirements and limitations. Some of the reports are required to be submitted directly to the District and the CPM; other records must be maintained for a minimum of two years and made available to the District upon request.

2. SF_6 MODELING PARAMETERS

Question 2.1: What were the lbs. of SF_6 per circuit breaker used to create the emissions model analysis?

Response: First we must note that the District has no authority over greenhouse gas emissions (GHG). GHG emissions from stationary sources are regulated by EPA through the Prevention of Significant Deterioration (PSD) program.[2] The District has not been delegated the authority to implement the PSD program for sources within its jurisdiction, so PSD requirements for stationary sources within the GBUAPCD are implemented by EPA Region 9. The applicant's calculations demonstrate that GHG emissions from the project are well below the PSD applicability threshold.

Although the District has no authority over GHG emissions, we did review the applicant's calculations, and those calculations indicate that the highest value in the range referenced by the commentor, 208 pounds per circuit breaker, was used in the calculations.

[2] EPA has also proposed to adopt a new source performance standard (NSPS) relating to GHG emissions from certain stationary sources, but the NSPS has not yet been adopted.

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Question 2.2: Since the lbs. of SF_6 vary depending on the manufacture, what is the range of SF_6 emissions the HHSEGS can potentially emit, depending on the specifications of the manufacturers cited?

Response: The applicant used the high end of the ranges of SF_6 contents and leakage rates referenced by the commentor to calculate maximum potential SF_6 emissions of $2.0x10^{-3}$ metric tons/yr from circuit breakers at the proposed project. Potential SF_6 emissions could theoretically be as low as zero.

Question 2.3: If each lb. of SF_6 is the equivalent of 11 tons of CO_2 as described by the EPA and the applicant estimates SF_6 requirements for the HHSEGS project are estimated to yield 48 metric tons of CO_2 p/year, does this indicate that only a little over 4 lbs. of SF_6 were modeled to derive the annual CO_2 yield? If not, why not? Please explain.

Response: Yes, the calculation of 4.4 lb/yr of SF_6 is consistent with the applicant's calculations.

Question 2.4: According to the EPA's conversion factor for each lb. of SF_6, the site will store the equivalent of 2,200 tons of potential CO_2 emissions. What is the applicants CO_2 equivalent of 200 lbs. of the SF_6 that will be stored onsite? Please explain.

Response: All of the SF_6 at the project site will be contained within the circuit breakers, as indicated in Table 5.5-2 of the AFC—there will be no additional SF_6 stored at the site. As shown in Note 6 to Table 5.1B-13 of the AFC, the project will include 4 breakers that contain up to 208 lb of SF_6 each and 2 breakers that contain up to 24.2 lb of SF_6 each. Total SF_6 contained within the circuit breakers is 880.4 lb, calculated as follows:

(4 * 208 lb) + (2 * 24.2 lb) = 880.4 lb

The quantity of SF_6 in Table 5.5-3 of the AFC should be shown as 880.4 lb. Converting this amount to CO_2 equivalents is not appropriate, since this equivalence occurs only when the SF_6 is released to the atmosphere, and not when it it stored.

Question 2.5: Does any of the SF_6 stored onsite have the potential to create emissions? If so, by what percent?

Response: Please see the responses to Questions 2.3, 2.4 and 2.6.

Appendix A **Question 2.6:** While the NEMA leakage standard for new circuit breakers is 0.1%, will this percentage degrade over the life of the project? If so, by how much and what are the cumulative impacts of the projected degradation?

Response: The applicant assumed a leakage rate of 0.5% over the life of the project. This accounts for any degradation beyond the NEMA leakage standard.

Question 2.7: While the applicant assumes an annual SF_6 1eakage rate of 0.5%, based on the EPA approved permit for the Palmdale Hybrid Power plant, is it more realistic to assume an annual leakage rate of 10%? If not, why not?

Response: The applicant's assumed leakage rate of 0.5% is documented and appears to be conservative. As discussed above, the District has no authority over GHG emissions.

3. CONDENSATE/FLASH TANKS

Question 3.1: Are air emissions specific to condensate and flash tanks included in the emissions evaluations for the HHSEGS? If so, where are they located?

Response: According to the applicant's documentation, the flash tanks will contain boiler blowdown, which will include steam that contains dissolved solids and silica. The water treatment chemicals will be in the form of dissolved solids. The tanks will not contain any volatile organic compounds and therefore are not regulated by the District.

Question 3.2: Prior to condensate being "flashed into the atmosphere", will the flash tanks vent any emissions? If so, what kind, how much and for how long?

Response: The flash tanks are not expected to vent any air pollutant emissions.

Question 3.3: What are the projected atmosphere emissions from the flashing process including kind of chemical, amount and duration?

Response: As indicated in the response to question 3.2 above, the flash tanks are not expected to vent any air pollutant emissions.

Question 3.4: Where are the flash tanks located at the project site?

Response: These tanks are too small to be seen on the plant layout figures. The flash tanks for the solar receiver steam generators are located next to each solar tower. The small flash tanks for the natural gas-fired boilers are located near the boilers.

4. THERMAL EVAPORATOR

Question 4.1: Does the use of thermal evaporators result in additional emissions/pollutants dispensed into the air? If so, how much and what kinds of emissions?

Response: According to the applicant, the thermal evaporators will use a distillation process to recover water from the wastewater and will be heated using an electric heat source. The distillation is a closed-loop process so the thermal evaporators will not generate any air pollutants.

Question 4.2: Are air emissions specific to the thermal evaporators included in the emissions evaluations for the HHSEGS? If so, where are they located?

Response: Please see the response to Question 4.1. The thermal distillation units will be located near the water treatment building at each power block.

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5. PIGGING FACILITIES

Question 5.1: Why are pigging facilities merely described as "possibly"?

Response: This question relates to the natural gas fuel system. Because the District rules exempt this type of equipment from permitting requirements (Rule 201 (d)(20): Equipment used exclusively to compress or hold dry natural gas), the District does not regulate this equipment. Potential environmental impacts of the fuel system are being evaluated by the CEC staff as part of their CEQA-equivalent review.

Question 5.2: What are the impacts of including pigging facilities at the HHSEGS site, i.e., construction, emissions, hazardous wastes, etc.?

Response: Emissions from construction of the onsite natural gas metering station were included in the evaluation of project construction emissions. With respect to hazardous waste and other environmental impacts, please see the response to Question 5.1 above.

6. EPA TOOLS: NATURAL GAS EMISSIONS

Question 6.1: How many of the EPA Recommended Tools will the HHSEGS incorporate?

Response: This question relates to the natural gas fuel system. Because the District rules exempt this type of equipment from permitting requirements (Rule 201 (d)(20): Equipment used exclusively to compress or hold dry natural gas), the District does not regulate this equipment. Potential environmental impacts of the fuel system are being evaluated by the CEC staff as part of their CEQA-equivalent review.

Question 6.2: Are there places within the current design system that do not incorporate these tools that can be redesigned to incorporate them?

Response: Please see the response to Question 6.1 above.

Question 6.3: How will each portion of the HHSEGS system comply and/or compare to all applicable recommendations on this page?

Response: Please see the response to Question 6.1 above.

7. DIESEL EXHAUST

Question 7.1: Since Table 5.1F-2 specifically cites "Inyo County, CA" Tons Per Year, were the "offsite emissions" calculations site-specific to the Inyo County portion of the project or did they include emissions produced from the Nevada side as well?

Response: The District has authority over stationary sources of emissions within the GBUAPCD; we have no authority over emissions from mobile sources, such as exhaust emissions from worker travel or truck deliveries, or over emissions sources within Nevada. The offsite emissions calculations do not include emissions in Nevada.

Question 7.2: What are the diesel exhaust PM_{10} concentrations in terms of daily and annual emissions?

Response: Although the District does not have authority over mobile sources of emissions, we did review the applicant's calculations of diesel exhaust PM_{10} during construction. Diesel exhaust PM_{10} emissions during construction is equivalent to the combustion portion of PM_{10} shown in Tables 5.1F-1 and 5.1F-2 of the AFC: 15.2 pounds per day and 1.3 tons per year.

Question 7.3: If diesel exhaust PM_{10} concentrations were included in the cumulative totals presented in Table 5.1F-2, what would the daily and annual cumulative emissions results be?

Response: As indicated in the response to Question 7.2, diesel exhaust PM_{10} is included in the cumulative totals presented in Tables 5.1F-1 and 5.1F-2 of the AFC as the combustion portion of PM_{10}. Therefore the daily and annual cumulative emissions are as presented in those tables.

Question 7.4: What were the parameters and inputs used to model the Health Risk of Diesel Exhaust to determine the applicants' conclusions, ie., areas of concentration, operations emissions, vehicular travel, mirror washing activities, etc.?

Response: With regard to diesel exhaust emissions from vehicular traffic, including mirror washing activities, please see the response to Question 7.1 above. Although the District does not have authority over mobile sources of emissions, we did review the applicant's description of the modeling analysis for construction emissions in Appendix F. The parameters and emission rates used to model vehicle exhaust emissions are described on page 5.1F-6 of the AFC (Dispersion Model).

Diesel exhaust will also be emitted by the emergency diesel generators and fire pump engines that will be part of the operational power plant equipment. The diesel particulate matter emissions from these diesel-fueled stationary engines were included in the applicant's screening health risk assessment. The parameters used in modeling those units are shown in Tables 5.1E-3 and 5.1E-5 of the AFC.

8. WORKER TRAVEL/TRUCK DELIVERIES: MAXIMUM DAILY EMISSIONS

Question 8.1: How does the applicants' use of averages accurately represent "maximum" and "peak" emissions impacts during the construction phase of the HHSEGS?

Response: The District has authority over stationary sources of emissions within the GBUAPCD; we have no authority over emissions from mobile sources, such as exhaust emissions from worker travel or truck deliveries. However, the District did evaluate the applicant's calculations of fugitive dust emissions from construction activities and believes that the calculations are based on reasonable assumptions and produce a reasonable estimate of peak fugitive emissions and impacts during

construction. For example, regarding peak daily emissions associated with worker travel during the construction phase of the project, the applicant's peak daily emissions calculations are based on 1,033 workers per day. This corresponds to the peak workforce estimate during the entire construction period (May 2014). The same is true for peak daily emissions associated with delivery truck emissions: the applicant's daily emission calculations are based on 384 truck deliveries occurring on a single day. This is clearly a peak daily number given that the total number of monthly truck deliveries range from 55 to 717 truck deliveries occurring during an entire month.

Annual emissions from worker and truck deliveries during the construction period are also based on the peak 12-month period. For example, the annual emissions for truck deliveries are based on a total of 6,151 deliveries per year. This represents the highest rolling 12-month total (May 2013 to April 2014) during the entire construction period. The same is true for annual emissions associated with worker travel—the calculation of annual worker travel emissions assumes 961 workers per day over a 12-month period. This represents the average number of workers per day occurring during the peak 12-month period (October 2013 to September 2014).

Question 8.2: Why is the applicant allowed to omit 2-3 days per month of emissions calculations for Worker Travel/Truck Deliveries?

Response: As discussed in the response to Question 8.1, the annual emissions are based on the peak number of workers and truck deliveries over a 12-month period. Therefore, the number of days per month is not a factor in these calculations.

Question 8.3: Were other emission calculations performed using 288 days in the year? If so, which ones?

Response: Because the District has no authority over mobile sources of emissions, the district has no information regarding other calculations of emissions from construction-related mobile source exhaust emissions. The 288 days per year referenced by the commentor is used by the applicant to convert annual emissions to g/sec emission rates for air quality dispersion modeling purposes. Given that construction work may not occur during some weekends over the course of a year, this number appears reasonable because it results in an average of 24 work days per month averaged over an entire year. This number does not appear to be directly used by the Applicant in other construction emission calculation.

Question 8.4: Has the use of "rolling averages" and other averages allowed the applicant to reduce maximum projected emissions in other calculations concerning actual impacts of the HHSEGS?

Response: As discussed in the responses to Question 8.1, the District believes that the construction calculations are based on reasonable assumptions and produce a reasonable estimate of peak fugitive emissions and impacts during construction. In addition, the District will ensure that the applicant's calculations of emissions from stationary sources represent maximum potential emissions form those sources. Emissions from the permitted stationary sources at the facility will be limited by the limitations and restrictions in the Authorities to Construct, so maximum emissions from those sources cannot exceed the emissions upon which the analyses in the application were based.

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9. PRODUCE EXPOSURE PATHWAYS

Question 9.1: Gardens were included in the applicant's own descriptions of the goals of the St. Theresa Mission, yet a health screening risk to local food production from the HHSEGS was not evaluated. Why not?

Response: The screening health risk assessment did not include the potential for exposure through the produce pathway because the applicant had no information to indicate that the gardens at St. Therese Mission would be producing food.

Question 9.2: What are going to be the impacts to local food production for residents in Charleston View?

Response: The District believes that the project will have no significant impacts on local food production for residents in Charleston View. The applicant's screening health risk assessment showed that the maximum potential cancer risk at any residential receptor is well below one in one million. The "Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments,"[3] which is the regulatory guidance used for preparation of screening health risk assessments, indicates that the only substance potentially emitted from the proposed project that may have health effects through produce ingestion is PAHs (see Table 5.1 of the Hot Spots Guidance Manual). As shown in Table 5.1E-2R of the AFC, PAH emissions from the project will be orders of magnitude below the emissions of other noncriteria pollutants, so we believe that consideration of the produce ingestion pathway for PAHs will not affect our conclusion that emissions from the project will not pose a health risk to the community.

10. PUBLIC NOTICE: AQIA TRIGGER LEVELS

Air Quality Impact Analysis (AQIA)

Question 10.1: How will project emissions and trigger levels be monitored to provide public notice as there is no air quality monitoring station within the area?

Response: The reference from the application does not relate to monitored ambient air quality. The reference is instead to a requirement under Rule 209-A for providing public notice of intent to issue an Authority to Construct (that permits a project to have emissions exceed the AQIA trigger levels in Rule 216). The proposed HHSEGS project has estimated NOx emissions exceeding the AQIA trigger levels, so the District reviewed the air quality impact analysis prepared by the applicant. The analysis demonstrates that the maximum impacts from NOx are below the ambient air quality standards (AAQS). The District Air Pollution Control Officer (APCO) will be issuing a public notice, to be published in two local newspapers (the Pahrump Valley Times and the Inyo Register) regarding his intent to issue permits to the project.

[3] Office of Environmental Health Hazard Assessment, "Air Toxics Hot Spots Program Risk Assessment Guidelines: The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments," August 2003, available at *http://oehha.ca.gov/air/hot_spots/pdf/HRAguidefinal.pdf.*

Question 10.2: Will residents be dependent on the owners of the plant as the sole source of monitoring air quality?

Response: The Authorities to Construct and subsequent Permits to Operate will not require ambient monitoring at the facility because the maximum modeled impacts are below the AAQS. Permit conditions ensure compliance with these standards. With respect to monitored air quality, air pollution control agencies monitor ambient concentrations of criteria air pollutants and post those concentrations on their websites and through printed publications. All of that information will be available to the public. CARB posts air quality data for locations throughout California at *http://www.arb.ca.gov/aqmis2/aqmis2.php*.

Question 10.3: What method(s) will the GBUAPCD Air Pollution Control Officer use to notify the residents of Charleston View in the event the project exceeds air quality standards?

Response: Please see the response to Questions 10.1 and 10.2.

Question 10.4: Will the GBUAPCD Air Pollution Control Officer also be required to notify residents of Pahrump?

Response: Please see the response to Questions 10.1 and 10.2.

Question 10.5: What is the definition and specific parameters of "timely manner"?

Response: In the cited instance, a “timely manner” means in accordance with the timeline provided the District’s rules. The District’s rules require the APCO to publish a notice in a newspaper of general circulation and to accept comments for 30 days after publication.

11. PSD CLASS I WILDERNESS AREAS

Question 11.1: Why is the Maximum Allowable Class II significant impact levels provided but not Class I?

Response: As discussed in the Preliminary Determination of Compliance (Section 11, p. 10), the Pahrump Valley Wilderness is not a designated Class I area. Because there are no designated Class I areas within 100 km of the project, comparison of project impacts with Class I significant impact levels is not required.

12. PSD SIGNIFICANT THRESHOLD TRIGGERS

Question 12.1: Why aren't CO_2 emissions included in the PSD Significant Thresholds in Table 5.1-1?

Response: CO_2 is included as part of greenhouse gases (GHG), which are shown in the cited table. GHG (which includes CO_2, CH_4, N_2O, SF_6 and others) is shown in the table because GHG and not CO_2 is the regulated pollutant. CO_2 emissions are shown separately in Table 5.1B-13 of the AFC.

Question 12.2: Are the PSD Significant Emissions Threshold tpy in Table 5.1-1 listed as metric tpy, a "short" ton p/y, or are they CO_2 equivalents?

Response: The thresholds listed are all listed in short tons per year. GHG is defined in terms of CO_2 equivalence, so the GHG threshold shown in the table on a CO_2e basis.

Question 12.3: Why are the PSD Significant Emissions Threshold trigger levels different in Table 5.1-1 versus Table 5.1-29?

Response: The trigger levels are different in the two tables because the tables are showing thresholds that apply for different purposes in the PSD program. Table 5.1-1 of the AFC shows PSD significant emissions thresholds, while Table 5.1-29 of the AFC shows PSD major source thresholds.

Question 12.4: Under what authority did changes to PSD Significant Emissions Threshold levels become effective as of July 1, 2011; federal, state, regional?

Response: The change to the GHG significant emissions threshold was made by a federal regulation.

Question 12.5: Why did Table 5.1-28 provide metric tons p/y for Nitrous Oxide and Methane but only provided a formula for the SF_6 emissions?

Response: Table 5.1-28 of the AFC shows SF_6 emissions of $2.0x10^{-3}$ metric tons per year.

13. INSUFFICIENT DATA: MODELING PARAMETERS

Question 13.1: Why is annual SO_2 and CO data missing from 2010?

Response: At the time the AFC was prepared, the final, quality-assured annual SO_2 and 8-hour CO were not available from the Air Resources Board (ARB) iADAM website. The District reviewed the complete 2010 data to ensure that the background concentrations used in the AFC were conservative. The 2010 annual average SO_2 concentration at Trona and 8-hour average CO concentration at Barstow were 0.001 ppm (2.7 $\mu g/m^3$) and 0.89 ppm (989 $\mu g/m^3$), respectively—equal to or lower than the background concentrations that were used in the applicant's modeling analysis.

Question 13.2: With 2010 annual NO_2 data classified as "insufficient", was this where the applicant filled in "missing data" during the modeling analysis? If so, why are the 2010 NO_2 values still missing?

Response: No. The annual NO_2 concentrations shown in Table 5.1-34 of the AFC are annual averages of monitored concentrations measured at nearby, representative air quality monitoring stations, and these averages are calculated and reported by the ARB—they are not updated or recalculated by the applicant. The modeling analysis relies on hourly NO_2 data. The discussion of filling in missing data refers to using conservative hourly NO_2 concentrations to fill in individual missing hours of measured NO_2 concentrations, following District-approved procedures.

14. UPPER AIR DATA: REPRESENTATIVE MODELING

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Question 14.1: What section of the Clean Air Act and/or Code of Federal Regulations requires upper air data to meet a 90% completeness data threshold?

Response: Upper air data is part of the meteorological data set that is used in ambient air quality modeling. 40 CFR Part 51 Appendix W contains EPA's permit modeling guidance, and refers to a specific meteorological monitoring guidance document, "Meteorological Monitoring Guidance for Regulatory Modeling Applications."[4] The 90% completeness requirement appears in Section 5.3.2 of the guidance document (p. 5-4), and reads as follows:

> "Regulatory analyses for the short-term ambient air quality standards (1 to 24-hour averaging) involve the sequential application of a dispersion model to every hour in the analysis period (one to five years); such analyses require a meteorological record for every hour in the analysis period. Substitution for missing or invalid data is used to meet this requirement. Applicants in regulatory modeling analyses are allowed to substitute for up to 10 percent of the data; conversely, ***the meteorological data base must be 90 percent complete (before substitution) in order to be acceptable for use in regulatory dispersion modeling***." [emphasis added]

Question 14.2: What section of the Clean Air Act and/or Code of Federal Regulations requires upper data used for site-specific modeling purposes to be exclusively taken from the three years closest to the proposed project?

Response: Upper air data is part of the meteorological data set that is used in ambient air quality modeling. Both Appendix W and the meteorological monitoring guidance document cited above recommend the use of a five-year meteorological data set.

> Appendix W:
>
> > 8.3.1.2 Recommendations
> > a. Five years of representative meteorological data should be used when estimating concentrations with an air quality model. Consecutive years from the most recent, readily available 5-year period are preferred. The ***meteorological data should be adequately representative***, and may be site specific or ***from a nearby NWS station***…
> >
> > b. ***The use of 5 years of NWS meteorological data or at least l year of site specific data is required…*** [emphasis added]

[4] Publication No. EPA–454/R–99–005. Office of Air Quality Planning & Standards, Research Triangle Park, NC. (PB 2001–103606). Available at *http://www.epa.gov/ scram001/*

"Meteorological Monitoring Guidance for Regulatory Modeling Applications:"

5.3.1 Length of Record

The duration of a meteorological monitoring program should be set to ensure that worst-case meteorological conditions are adequately represented in the data base; the minimum duration for most dispersion modeling applications is one year. Recommendations on the length of record for regulatory dispersion modeling as published in The Guideline on Air Quality Models **[1]** are: ***five years of National Weather Service (NWS) meteorological data*** or at least one year of site-specific data. Consecutive years from the most recent, readily available 5-year period are preferred. [emphasis added]

15. $PM_{10}/PM_{2.5}$ SUBSTITUTIONS

Question 15.1: Is PM_{10} and $PM_{2.5}$ data available from the Pahrump monitoring station that would satisfy a 90% data completeness threshold for EPA regulatory air quality monitoring standards for the years 2003-2010?

Response: $PM_{2.5}$ is not monitored at Pahrump; therefore no $PM_{2.5}$ data is available from Pahrump.

Data used to represent existing background concentrations is not required to meet a 90% completeness criterion. The 90% criterion is applicable only to the individual meteorological data elements that are used in ambient air quality modeling (such as surface and upper air wind speeds, wind directions, etc.). The applicant explained why PM_{10} concentrations from Pahrump were not used to represent existing background concentrations at the project site. The District concurs in the applicant's assessment that PM_{10} concentrations monitored at Jean better represent conditions in the project area than PM_{10} concentrations monitored at Pahrump.

Question 15.2: Even though the southern end of Pahrump is cited as 4 miles away, no analysis, discussion or cumulative analysis was applied to HHSEGs impacts to Pahrump's air quality. Why?

Response: The ambient air quality impact analysis included receptors in California and Nevada, and the air quality impacts of the project reported in Table 5.1-36R of the AFC represent the highest modeled concentrations at any receptor. The highest PM_{10} and $PM_{2.5}$ modeled impacts form the project are below the levels considered by EPA to be significant. Based on this, we conclude that the project will not have significant PM_{10} or $PM_{2.5}$ impacts anywhere, including in Pahrump. Because there will be no significant impacts, the District determined that no additional analysis, discussion or cumulative analysis of impacts at Pahrump were necessary.

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16. FINAL GEOTECHNICAL ANALYSIS: ADDITIONAL AIR-QUALITY MODELING

Question 16.1: Will the applicant remodel all PM_{10} and $PM_{2.5}$ air quality and fugitive dust emission calculations after reviewing the final Geotechnical Report?

Response: The District does not intend to require remodeling of fugitive dust emissions. The draft Authorities to Construct include conditions that require mitigation of dust emissions, including the use of best practices to minimize fugitive dust emissions during construction and operation. The District believes these conditions will be adequate to ensure that fugitive dust emissions are minimized.

17. SOIL LOSS. WIND EROSION: AFFECTED ACREAGE

Question 17.1: What is the unnumbered/unnamed table in Appendix 5.11A soil loss calculations in reference too?

Response: Soil loss and water erosion are not within the jurisdiction of the District. Soil loss and water erosion issues are being addressed by the CEC staff in the context of their CEQA-equivalent review.

Question 17.2: Why does this unnumbered/unnamed table have significantly less notes, project assumptions and description of input parameters than Table 5.11-3 for Water Erosion?

Response: Please see the response to Question 17.1.

Question 17.3: Why, in all modeling for soil loss calculations in Appendix 5.11A, did the applicant use the input of "dense grass, not harvested" as representing the No Project parameters when this fails to represent site-specific arid environmental conditions?

Response: Please see the response to Question 17.1.

Question 17.4: Why does the affected acreage total in Table 6 (412 acres) differ from the individual acreage breakdown in Table 5.11-3 and the unnumbered/unnamed table in the Soil Loss Calculation Appendix (418 acres)?

Response: Please see the response to Question 17.1. The District has relied on the emissions calculations and ambient air quality impact analysis in Appendix 5.1F of the AFC for conclusions regarding construction fugitive dust impacts, including $PM_{2.5}$ and PM_{10} impacts. There is no longer an ambient air quality standard for Total Suspended Particulates.

Question 17.5: In what section of the applicants documents is the total suspended particles (TPS) modeled and what methods/input was used to determine Table 6's conclusions?

Response: Please see the responses to Questions 17.1 and 17.4.

APPENDIX C: Responses to the Air Quality section of Cindy MacDonald's Preliminary Public Comments, Technical Analysis & Recommendations (Pages 1-35), Posted March 29, 2012 and Submitted directly to the Great Basin Unified Air Pollution Control District on April 12, 2012.

Question 17.6: How does the total suspended particles calculated at tons p/year differ from soil loss estimates calculated as tons p/year?

Response: Please see the response to Question 17.1.

18. LEVEL 2 EMISSION FACTOR

Question 18.1: What is the correct value assigned by the Midwest Research Institute, 0.11 tons/acre/month as stated in the URBEMIS software-or 0.011 tons/acre/month as used by the applicant?

Response: The correct value is 0.011 tons/acre/month, as used by the applicant. This is the Level 2 value shown in Table ES-2 of the 1996 Midwest Research Institute report, reproduced below. As indicated in the table, the Level 1 emission factor should be used if only the disturbed area and duration are known. However, the Level 2 emission factor was used since the applicant had specific data about other equipment operation, such as the activity for scrapers, graders, and other off-road equipment traveling on unpaved surfaces and roadways

Table ES-2. Recommended Emission Factors

Basis for emission factor	Recommended PM_{10} construction emission factor
Level 1—Only area and duration known	Apply 0.11 ton/acre-month (average conditions) 0.42 ton/acre-month (worst-case conditions)
Level 2—Area and amount of earthmoving known	Apply 0.011 ton/acre-month for each month of construction activity Plus 0.059 ton/1,000 $yard^3$ of on-site cut/fill 0.22 ton/1,000 $yard^3$ of off-site cut/fill These values are based on an assumption that one scraper can move 70,000 $yard^3$ of earth in one month and 35,000 $yard^3$ of material can be moved by truck in one month. If the on-/off-site fraction is not known, assume 100% on-site.
Level 3—More detailed information available on duration of earthmoving and other material movement.	Apply 0.13 lb/acre-work hr plus 49 lb/scraper-hr for on-site haulage[a] 94 lb/hr for off-site haulage[b]
Level 4—Detailed information on number of units and travel distances available	Apply 0.13 lb/acre-work hr plus 0.21 lb/ton-mile for on-site haulage 0.62 lb/ton-mile for off-site haulage[b]

[a] If the number of scrapers in use is not known, a default value of 4 may be used. In addition, if the actual capacity of earthmoving units is known, values given in the body of the report should be used.

[b] Factor for use with over-the-road trucks. If "off-highway" trucks are used haulage should be considered "on-site."

19. ACRES: WINDBLOWN DUST EMISSIONS MODELING

Question 19.1: Why is only 276,744 sq-ft or 6.35 acres used to calculate windblown PMI0 dust emissions from active construction sites?

Response: The area used to calculate windblown dust emissions corresponds to the maximum expected disturbed area resulting from active construction activities. This area is significantly smaller than the total area that will be disturbed during all construction activities due to mitigation requirements to minimize the area of disturbance and to replace ground cover and stabilize disturbed surfaces to the extent feasible. Therefore, it was estimated that 276,744 square feet (or 6.35 acres) would be actively disturbed at any one time. This value was calculated from the total disturbed area (3,202 acres) divided by the total months of expected active surface disturbance (21 months) and the total number of working days per month during expected active surface disturbance (24 days).

Question 19.2: Why do the windblown dust values never change in the PM10 analysis, despite increases in construction activities over the course of the construction phase of the project?

Response: The windblown dust emissions are proportional to the total area of active disturbance and are not directly related to the level of other construction activities. As discussed in the response to Question 19.1, this value was estimated at 6.35 acres disturbed at any time throughout the life of the project. The level of other construction activities during the various phases of construction may be estimated by the level of off-road and on-road vehicle use. Fugitive dust emission from these vehicles are calculated separately and added to the windblown dust emissions. Therefore, months with higher off-road and on-road vehicle use will result in higher total dust emissions. However, increased vehicle activity and travel on unpaved surfaces does not suggest an increased active area of surface disturbance. Rather, increased vehicle activity simply represents more VMT within the active disturbed area, which is assumed to remain constant.

Question 19.3: Is the value assigned by the applicant for windblown dust PM_{10} emissions (2.51E-06) the same as the 0.11 tons/acre/month value cited by the Midwest Research Institute?

Response: The controlled PM_{10} emission factor of 2.51 E-6 lbs PM_{10}/sf of active construction area is neither equivalent to, nor based on, an emission factor of 0.11 tons/acre-month. The emission factor of 0.11 tons/acre-month is the Level 1 emission factor reported by Midwest Research Institute. As explained under the response to Question 18.1, the Level 2 emission factor of 0.011 tons/acre-month was used by the applicant, in addition to additional fugitive dust emissions calculated from off-road and on-road vehicle travel on unpaved surfaces and roads. The emission factor of 2.51 E-6 lbs PM_{10}/sf of active construction area is equivalent to 0.011 tons PM_{10}/acre-month (0.73 lbs PM_{10}/acre-day or 1.68 E-5 lbs PM_{10}/sf-day) after applying an 85 percent control factor for watering and other soil stabilization measures.

Question 19.4: Does the 0.11 tons/acre/month value translate into 10 lbs p/day? If so, how is this applied to dust emission calculations for active construction areas at the HHSEGS project site?

Response: As explained in the response to question 19.3, the HHSEGS construction analysis did not rely on an emission factor of 0.11 tons/acre-month.

Question 19.5: In calculating disturbed acreage and emissions factors, has the applicant factored in perimeter disturbance areas that extend beyond the buildings, heliostat placement, electrical trenching, etc.? If so, by what factors?

Response: Construction of the project will not require mass grading of the entire solar field—this type of activity will be reserved only for the power blocks and common area. Nevertheless, the active construction areas were estimated to be nearly the entire project site area—an area larger than the building areas, heliostat placement areas, and areas of onsite trenching. The total disturbed area from construction activities was assumed to be 3,202 acres, consisting of 1,482 acres for Solar Plant 1, 1,509 acres for Solar Plant 2, 108 acres of temporary construction areas, and 103 acres of common area. It is noted that the final site area used in the AFC document was 3,277 acres—or 2.3 percent larger than the area used for windblown dust emission factors, but nonetheless accounting for perimeter areas. However, as noted in the answer to Question 19.1, only a fraction of the total site area will be actively disturbed at any one time, with the remainder of the area stabilized to prevent wind erosion.

20. WORKER TRAVEL/TRUCK DELIVERIES: DUST EMISSIONS

Question 20.2: Is there an analysis for PM_{10} and $PM_{2.5}$ dust emissions for Delivery Trucks? If so, where is it located?

Response: For the most part, trucks delivering power plant components are not anticipated to travel on unpaved roads or surfaces, and therefore will not significantly contribute to onsite PM_{10} or $PM_{2.5}$ emissions. Rather, delivery trucks are expected to remain on the internal paved roads and surfaces within the project boundaries and deliver their loads to those areas. From those paved areas, the power plant components will be transported to their installation locations via (largely off-road) vehicles for which PM_{10} and $PM_{2.5}$ emissions were calculated in the analysis. These fugitive PM_{10} and $PM_{2.5}$ emissions are shown in Tables 5.1F-1 and 5.1F-2 of the AFC. It is noted that certain “on-road” vehicles were also accounted for in this analysis (as operating on unpaved surfaces). These on-road vehicles include up to 20 transmix trucks, one semi-truck/tractor, up to three water trucks, and up to six pickup trucks.

21. AWD GATORS/ATV DUST EMISSIONS

Question 21.1: What is an "AWD Gator" and what function will it perform during the HHSEGS construction phase of the project?

Response: The term “Gator” refers to a small, lightweight, utility vehicle, with the “AWD” designating that the vehicles are all-wheel drive. This type of vehicle is most commonly used on golf courses, for landscaping, and for internal transport on large campuses. These vehicles are expected to be used at the project in much the same way—to deliver personnel, light tools, and small quantities of materials to various locations internal to the project area.

Question 21.2: If the John Deere "Gator" is what the applicant is referencing in their construction equipment, why are there no dust emissions calculations included in their impact analysis?

Response: Similar to delivery vehicles, the utility vehicles are not expected to operate excessively on active disturbed surfaces, and therefore would not contribute significantly to onsite fugitive PM_{10} and $PM_{2.5}$ emissions. Rather, these vehicles will operate mainly on paved, improved, and stabilized surfaces. Their emissions are accounted for under Fugitive Dust in Tables 5.1F-1 and 5.1F-2 of the AFC.

Question 21.3: If the AWD Gator is not an ATV, where has the applicant listed and calculated impacts from ATV use at the HHSEGS project site, including estimated acreage disturbances and PM_{10} and $PM_{2.5}$ dust emissions?

Response: As stated in the answer to the previous question, the Gator vehicles are utility vehicles that will operate internally to deliver personnel, light tools, and small quantities of material to various locations internal to the project. These utility vehicles are not engaged in activities that create additional active construction or disturbed areas beyond those already accounted for in the analysis and shown in Tables 5.1F-1 and 5.1F-2 of the AFC.

22. FUGITIVE DUST: CUMULATIVE IMPACTS

Question 22.1: Was an air dispersion model performed that incorporated fugitive dust and emissions impacts occurring within the HHSEGS project site combined with impacts at the fenceline? If not, why not?

Response: Yes, the ambient air quality impact analyses evaluated the impacts of all on-site activities and emissions to off-site air quality. The construction impacts analysis included exhaust emissions from the construction equipment, mechanically generated fugitive dust emissions (from the activities of the construction equipment, such as grading, excavation and travel), and windblown fugitive dust. The air quality impact analysis for the operational phase of the project included the boilers, the engines, the wet surface air coolers, and both exhaust and fugitive dust emissions from activities of the mirror washing machines. These project impacts were then added to background concentrations to estimate total impacts; the results are shown in the AFC at Table 5.1-38.

23. FUGITIVE DUST CONTROL: WATER TRUCK MODELING

Question 23.1: If the water trucks will only be operational 10 hours a day, what happens with dust emissions during the other 14 hours water is not being applied?

Response: The analysis assumes that up to three water trucks will each operate up to 10 hours per day (for a total of 30 truck-hours/day) during all phases of the project when disturbed active construction areas will occur. The water trucks were assumed to travel a combined 90 miles per day while performing their intended function. Operation of the water trucks is not limited to ten consecutive hours of simultaneous operation. Rather, operation of the trucks will be staggered, and likewise, will be intermittent throughout the construction day to ensure that the actively disturbed areas will be adequately wetted to minimize fugitive dust emissions.

Question 23.2: To determine dust emissions, was the equation that used water applications every 6 hours applied to a 24-hour period or was it only for the 10 hours the water trucks will actually be operational?

Response: The watering frequency is expected to be once every six hours (during a 24-hour period) rather than once every six hours during a 10-hour period of consecutive operation. The latter would

equate to only one watering event per calendar day, which is a much lower level of control than what is assumed in the analysis.

Question 23.3: Water trucks will only be operational for 10 hours. If water is only applied every 6 hours, is it reasonable to assume that the water trucks will only apply water once on an exposed area during their shift?

Response: Water trucks will be available for operation, as needed on a continuous basis, and not only during a consecutive ten-hour period during a 24-hour calendar day. Therefore, it is incorrect to assume that water will be applied only once per shift. As previously stated, water will be applied, as needed, on average of once every six hours. The watering frequency may be more frequent if activities and conditions dictate. Watering will be reduced during wet periods, during calm periods, and during periods of minimal surface disturbance.

24. FUGITIVE DUST CONTROL: INADEQUATE IMPACT ANALYSIS

Question 24.1: Since Bright Source is farther along in the construction phase of the Ivanpah SEGS, has the demands of its construction yielded any more specific plans, product information and safety data regarding similar mitigation measures to be utilized for fugitive dust control and soil erosion at the Ivanpah site?

Response: As discussed in the response to Question 17.1, the question of soil erosion control is outside the jurisdiction of the District and will be addressed by the CEC in their CEQA-equivalent review. The District is proposing to adopt by reference the CEC's mitigation measures for fugitive dust control at HHSEGS (see Condition 30 of the draft ATC). These mitigation measures are expected to be essentially identical to the construction fugitive dust mitigation measures imposed by the CEC in their license for the Ivanpah SEGS project (and other, similar projects located in desert areas). The District understands from the CEC staff that these conditions have been successful in minimizing fugitive dust emissions from construction activities at Ivanpah and other desert solar projects. Typical fugitive dust mitigation conditions are as follows:

> The following fugitive dust mitigation measures shall be included in the Air Quality Construction Mitigation Plan (AQCMP) prepared by the applicant …
>
> > a) The main access roads through the facility to the power block areas will be either paved or stabilized using soil binders, or equivalent methods, to provide a stabilized surface that is similar for the purposes of dust control to paving, that may or may not include a crushed rock (gravel or similar material with fines removed) top layer, prior to initiating construction in the main power block area, and delivery areas for operations materials (chemicals, replacement parts, etc.) will be paved prior to taking initial deliveries.
> >
> > b) All unpaved construction roads and unpaved operational site roads, as they are being constructed, shall be stabilized with a non-toxic soil stabilizer or soil weighting agent that can be determined to be both as efficient or more efficient for fugitive dust control as ARB approved soil stabilizers, and shall not increase any other environmental impacts

including loss of vegetation. All other disturbed areas in the project and linear construction sites shall be watered as frequently as necessary during grading; and after active construction activities shall be stabilized with a non-toxic soil stabilizer or soil weighting agent, or alternative approved soil stabilizing methods, in order to comply with the dust mitigation objectives of Condition of Certification AQ-SC4. The frequency of watering can be reduced or eliminated during periods of precipitation.

c) No vehicle shall exceed 10 miles per hour on unpaved areas within the construction site, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

d) Visible speed limit signs shall be posted at the construction site entrances.

e) All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.

f) Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

g) All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.

h) All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the CPM and BLM Authorized Officer.

i) Construction areas adjacent to any paved roadway below the grade of the surrounding construction area or otherwise directly impacted by sediment from site drainage shall be provided with sandbags or other equivalently effective measures to prevent run-off to roadways, or other similar run-off control measures as specified in the Storm Water Pollution Prevention Plan (SWPPP), only when such SWPPP measures are necessary so that this condition does not conflict with the requirements of the SWPPP.

j) All paved roads within the construction site shall be swept daily or as needed (less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.

k) At least the first 500 feet of any paved public roadway exiting the construction site or exiting other unpaved roads en route from the construction site or construction staging areas shall be swept as needed (less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff resulting from the construction site activities is visible on the public paved roadways.

l) All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered, or shall be treated with appropriate dust suppressant compounds.

m) All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least one foot of freeboard.

n) Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

APPENDIX D: Responses to Intervener Cindy MacDonald's June 5, 2012, Comments to the Great Basin Unified Air Pollution Control District Regarding the Preliminary Determination of Compliance for the Hidden Hills Solar Electric Generating Project

RESPONSE PREPARERS

Question 1.1: Who are the responsible parties for developing and preparing the responses given in the GBUAPCD's PDOC, Appendix A? Please provide names of all organizations, consultants, groups and individual preparers.

Response: The District asked the applicant to provide draft responses to the air quality-related questions raised in Cindy MacDonald's March 9, 2012, letter to the California Energy Commission (CEC) and subsequent (April 12, 2012) submittal to the District. The applicant's consultant, Sierra Research, provided draft responses as requested. The final responses included in Appendix A (Responses to the Air Quality Section of Cindy MacDonald's Preliminary Public Comments) of the PDOC were prepared by Jon Becknell of the District staff as part of compiling the PDOC and were approved by Duane Ono, Deputy Air Pollution Control Officer.

2. NON-DISCLOSURE PLANS

Question 2.1: How many plans total, which are integral to operations and compliance of the proposed project, are incorporated in the PDOC as being required to be submitted and/or incorporated after the CEC CEQA equivalent process and the GBUAPCD's public process and disclosure periods have been closed?

Response: The PDOC requires two plans to be submitted after the final permit has been issued: a Boiler Predictive NOx Emission Rate Monitoring Plan and an Air Quality Construction Mitigation Plan.

Question 2.2: How does these preliminary permit conditions (such as allowing the applicant to submit a NOx emissions rate plan up to one year after initial startup), comply with CEC CEQA equivalent compliance or NEPA requirements that mandate environmental impact analysis of the proposal be publicly disclosed, examined and reviewed prior to approval?

Response: CEQA requires that the potential environmental impacts of a project be disclosed and, if required, mitigated to a level that is less than significant. If mitigation is necessary, verification (mitigation monitoring) measures are adopted to ensure that the mitigation is performed as required. The project's potential air quality impacts have been evaluated and examined by staff of both the District and the CEC, and disclosed to the public through the District's PDOC and CEC staff's Preliminary Staff Assessment in accordance with CEQA and NEPA. The staffs of the CEC and District have proposed mitigation measures and verification (monitoring) conditions they believe are necessary and adequate to mitigate potentially significant impacts. Among the mitigation monitoring measures are the requirements to prepare and submit to the District and the CEC for approval the two plans identified in Response 2.1. The PDOC and the CEC's proposed staff conditions related to air quality (Conditions AQ-SC1 through AQ-SC5 of the PSA, incorporated by reference in Condition 30 of the PDOC; and Conditions 18 and AQ-18 of the PDOC and PSA, respectively) include requirements for these mitigation monitoring plans. The public has the opportunity to review and comment on the

requirements for the plans before the conditions become final. Plans that do not meet the requirements of the conditions will not be approved by the District.

3. SF6 MAINTENANCE, REPLACEMENT AND WITHDRAWAL REQUIREMENTS

Question 3.1: While the GBUAPCD lacks enforcement authority over the proposed project regarding Green House Gases (GHG) of which SF6 contributes too, are they still required to evaluate the applicant's data and make determinations of accuracy regarding the application of a proposed project in their District?

Response: While the District has no direct authority over GHG emissions, as stated in pages 1-3 of Appendix A, the District did review the applicant's calculations of potential GHG emissions from the project and determined that the calculations were reasonable.

Question 3.2: What are the annual anticipated maintenance, replacement and withdrawal requirements of SF_6 at the proposed project site as well as over the life of the project, where has the applicant disclosed this information in the AFC files or subsequent documents and where has the GBUAPCD accounted for them in their PDOC?

Response: The SF_6-containing circuit breakers will be sealed. No SF_6 withdrawal is anticipated. SF_6 recharge (maintenance or replacement) may be required periodically to replace the SF_6 lost to leakage or contamination, but would not be expected to result in any additional emissions of SF_6. Therefore, no disclosure or accounting is necessary.

4. CHANGES IN SF6 STORAGE QUANITIES

Question 4.1: Was the GBUAPCD aware of this change? If so:

a) What are the GBUAPCD's projected annual GHG operating emissions from the proposed project resulting from this revision in terms of tons and where is the GBUAPCD's evaluation and/or findings of this increase located in the PDOC?

Response: The District is aware that the amount of SF_6 listed in Table 5.5-3R1 is different from amount of SF_6 discussed in Appendix A. It is the District's understanding that Table 5.5-3R1 simply corrected the maximum projected onsite storage quantity to match the quantity assumed for the GHG emissions calculations in the air quality section, and did not affect the calculation of potential GHG emissions from SF_6. Therefore, there was no "increase" to be evaluated. The revised facility GHG emissions, reflecting the reduction in annual natural gas used due to elimination of the two largest boilers, are 44,394 tons per year of CO_2 equivalent (CO_2e). The PDOC evaluates the emissions of CO_2e, as revised in the April 2012 boiler optimization filing, in Section 11, PSD Considerations, on pp. 10 and 11.

b) Why did the GBUAPCD limit their response in Appendix A regarding SF_6 emissions to only include SF_6 onsite storage within the parameters of the original AFC files versus the proposed projects revisions?

Response: As discussed in the preceding response, the boiler optimization revisions did not affect the quantity of SF_6 to be used in the breakers, and therefore did not affect the potential SF_6 emissions from the project. No additional SF_6 beyond that in the breakers themselves will be stored onsite.

5. MOBILE EMISSIONS SOURCES

Question 5.1: Who is the responsible agency for monitoring and regulating mobile sources and offsite emissions resulting from the proposed project. Please also include those that cross state/county lines?

Response: Following is a list of agencies with authority over mobile sources and offsite emissions related to the proposed project:

Agency	Authority
U.S. Environmental Protection Agency	Emission standards for new motor vehicles, new non-road engines and new off-road engines
California Air Resources Board (California only)	Emission standards for new motor vehicles, new non-road engines and new off-road engines; in-use on-road and off-road engines; in-use off-road vehicle fleets
Great Basin Unified Air Pollution Control District (California only)	Fugitive dust mitigation
California Energy Commission (California only)	Construction exhaust and fugitive dust mitigation
Clark County Air Pollution Control District (Clark County, NV only)	Fugitive dust mitigation
Nevada Department of Environmental Protection (Nye County, NV)[1]	Fugitive dust mitigation
Bureau of Land Management (Federal lands)	Fugitive dust mitigation
1. Nevada DEP has jurisdiction over fugitive dust emissions in all of Nevada except for Clark and Washoe Counties.	

6. TEMPORARY CONSTRUCTION/COMMON AREA EMISSIONS

Question 6.1: Under which "heading" in Appendix 5.1F, has the applicant included the emissions impacts from construction and development of the temporary construction site and common area and where has the GBUAPCD addressed these emissions in the PDOC?

Response: Construction-related emissions for the temporary construction site and the common area are included in the equipment loadings for "Solar Field Assembly and Installation," "Concrete Batch Plant," and "Miscellaneous," as well as in the calculation of $PM_{10}/PM_{2.5}$ emissions under "Windblown Dust (active construction area)." Emissions from construction activities are addressed in Section 7.D of the PDOC (page 8). All construction activities at the project site, including at the temporary construction

site and in the common area, will have to comply with District Rule 401 (fugitive dust) and PDOC Condition 30.

7. HELIOSTAT COMMUNICATIONS SYSTEM

Question 7.1: If the applicant chooses to directly wire the heliostats, how many feet/yards/miles of trenching will be required and were they accounted for in the PDOC? If so, where?

Response: If the applicant chooses to directly wire the heliostats, the wiring between the control power distribution unit and the heliostats and the wiring between the heliostats will be above ground. The analysis reviewed for the PDOC assumed the entire project site would be disturbed so no further analysis required.

Question 7.2: How much additional land disturbance would result from direct wiring and was this accounted for in the PDOC? If so, where?

Response: The analysis reviewed for the PDOC assumed that the entire project site would be disturbed.

Question 7.3: If the applicant chooses to directly wire the heliostats, what heavy equipment will be required to install it, what is the projected increase in construction emissions associated with the proposed project and was this accounted for in the PDOC? If so, where?

Response: If the applicant chooses to directly wire the heliostats, installation will be done using vehicles such as the tractors and pickup trucks that are already included in the construction equipment schedule. The construction emissions will be the same as those for a wireless system and no increase in emissions would be expected.

Question 7.4: What is the estimated number of additional workers trenching would require, what hours of the day would they trench, what months would this affect during the construction portion of the project, how many feet/yards/miles is projected to be completed each day and was this accounted for in the PDOC? If so, where?

Response: If the applicant chooses to directly wire the heliostats, the wiring will be above ground. The construction activities and emissions will be the same as those for a wireless system and no increase in emissions would be expected.

8. ANNUAL CONSTRUCTION EMISSIONS

Question 8.1: What were the methods and how did the GBUAPCD determine consistency and conformance as a result of the applicant's use of these two different formulas to determine project emissions impacts with almost a 100-day variable between the two methods?

Response: The two formulas cited in the comment were used for different purposes. Total annual emissions from construction activities were calculated from daily equipment loadings assuming 16 construction days per month. Those total annual emissions were then distributed to individual hours for modeling purposes using 24 days per month during which construction could take place. Total annual emissions used for modeling were the same as total annual emissions calculated for the project, but emissions were allocated to more hours to ensure that the full range of meteorological conditions would be represented in the modeling results.

Question 8.2: Does the GBUAPCD find the applicant's use of a 16-day a month construction schedule believable or realistic for annual emissions calculations? In relation to the applicants projected time frame for project completion, including times of high intensity construction activity such as concrete batch production such as will occur in the summer of 2013? If so, please explain why?

Response: The hourly and daily construction equipment activity schedules were developed from the initial annual estimates based on a 16-day-per-month (4 days per week, 10 hours per day) operating schedule in order to conservatively overestimate worst case hourly and daily emissions. If a 5-day-per-week schedule had been assumed, the number of concurrently operating vehicles and/or the number of vehicle operating hours per day (or some combination of the two), would be reduced by 20 percent to accomplish the scheduled weekly construction tasks. For example, with a 5-day work week, daily working hours would be reduced from 10 to 8 (to maintain a 40 hour work week) and peak daily emissions would be 20 percent lower than the emissions analyzed.

9. MILES PER HOUR

Question 9.1: In the Construction Equipment Emission Factors, what is the column title, "Tier (Nonroad), Avg. mph (Onroad)", referring too – average miles per hour the vehicle is estimated to travel or average speed of the vehicle?

Response: The column shows the US EPA/California ARB engine certification tier (mainly Tier 3) for nonroad vehicles, and the average miles traveled per hour of travel for onroad vehicles. The differing units are needed because the conventions for calculating emissions from nonroad and offroad equipment differ. Exhaust emissions from nonroad equipment are typically calculated per unit of operating time (i.e., grams per horsepower *per hour*); whereas, exhaust emissions from onroad vehicles are calculated per distance the vehicle travels (i.e., grams *per mile*).

Question 9.2: If the Construction Equipment Emission Factors in the column titled, "Tier (Nonroad), Avg. mph (Onroad)", is referring to emissions resulting from the speed of the vehicle, how accurate are these emissions when the conditions of the permit authorize speeds up to 10-25 mph, depending on surface type?

Response: For on-road vehicles, the average miles traveled during an hour of travel (10) is an activity level, not a speed. The distance (in vehicle miles traveled per hour) is multiplied by the emission factors (in grams per vehicle mile traveled) to calculate pounds per hour of emissions from on-road-type vehicles. The speed limit of 25 mph applies to instantaneous speed, while the average miles the vehicle

is estimated to travel during an hour reflects the average distance traveled over an entire hour, including stops.

Question 9.3: If the emissions were calculated for non-road vehicles using a 10 mph vehicle speed, what is the difference (if any) in emissions impacts?

Response: Emissions from non-road vehicles were not calculated using a 10 mph vehicle speed—they were calculated using Tier-specific emission factors that are not speed-based.[5]

10. CONCRETE BATCH, EMISSIONS CALCULATIONS AND HOURS OF OPERATION

Question 10.1: If the Concrete Batch Plant is estimated to operate for 21 hours per day, why is its associated equipment only projected to operate for 8 and 5 hours a day? Please explain timetables and operating procedures and explain why the GBUAPCD found them acceptable for emissions calculations in the PDOC.

Response: The analysis assumes that up to two loaders and 20 transmix trucks will <u>each</u> operate up to 8 and 5 hours per day, respectively. This results in a total of 16 loader-hours per day and 100 transmix vehicle-hours per day of operation when the concrete batch plant is in operation. Because the plant operates in batch and not continuous mode, the loaders would not be expected to operate continuously for 21 hours. Rather, only up to 16 hours of active loading during the 21 hours of concrete batching is anticipated, which is an extremely conservative assumption. The five operating hours per day (when loading is not occurring) represents periods of time throughout the day when the plant has an adequate quantity of aggregate stored in its hopper for the current (or next) batch, and the loaders may be turned off. On the other hand, the transmix trucks will be in relatively continuous operation, and this is accounted for in the up to 100 vehicle-hours per day of activity per day assumed for these vehicles.

11. DIESEL EXHAUST

Question 11.1: What are the specific parameters, definitions, criteria, complaint remedies and penalties the GBUAPCD has established for non-compliance with Rule 402 in order to prevent nuisance odors and associated impacts from diesel exhaust such as those outlined above?

Response: The parameters, definitions and criteria that define a nuisance are included in the language of the rule, as cited on page 8 of the PDOC: "quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which

[5] The original calculations assumed that most of the construction equipment would be equipped with Tier 3 engines. At the request of the CEC, the applicant revised the analysis to reflect some limitations on the ability of construction contractors to obtain Tier 3 engine-equipped vehicles. The revised construction impacts analysis, which reflects the use of some higher-emitting Tier 2 engines, was submitted in response to Data Request 8 (Set 1A) in November 2011, and was reflected in the boiler optimization filing.

cause, or have a natural tendency to cause, injury or damage to business or property." Procedures and activities related to complaints are described on the District's website at http://www.gbuapcd.org/complaint.htm. The site provides contact names, addresses and telephone numbers that may be used in filing a nuisance compliant and indicates that following a nuisance report, "Great Basin Air Quality Specialists will inspect the site as soon as possible." The District has the right of entry to the project site under District rules and PDOC Condition 3. If the District determines that non-compliance has occurred, a Notice to Comply may be issued in accordance with District Rule 109 (C) and (D). Penalties may be assessed in accordance with Division 26 of the Health and Safety Code, Section 42400, et seq.[6]

Question 11.1: Did the GBUAPCD analyze/or model emissions for months with significantly "higher than average" emissions or request quarterly emissions profiles in efforts to ascertain direct, indirect and/cumulative impacts to local air quality and public health such as those that occur in summer of 2013 due to heightened construction activity? If not, why not?

Response: As stated in our responses to the questions on the topic of worker travel and truck deliveries (Question 8) in Cindy MacDonald's April 12, 2012, submittal, the figure of 717 truck deliveries reflects monthly, not daily, deliveries. It is not apparent that there are months with "significantly higher than average" emissions. In addition, the health-based standards that apply to diesel particulate matter (DPM) are long-term and not short-term standards. As a result, all analyses of health risk of DPM evaluated impacts on only an annual or longer-term basis (chronic risk is evaluated on an annual basis, cancer risk over a 9- to 70-year period) as there are no air quality-related regulatory thresholds that apply to shorter exposures.[7]

12. FOOD PRODUCTION/PRODUCE EXPOSURE PATHWAYS

Question 12.1: While it is acknowledged that serpentine habitat containing specialized soils and adaptive plant species related to those soils may be adversely affect from NOx emissions, could the NOx emissions and their cumulative impacts over the life of the project effect the wide variety of fruits and vegetables grown in the area for local food production (as detailed in my April 12, 2012 submission)?

Response: Ambient air quality standards are set at levels that are protective of public health and welfare.[8] The District is responsible for evaluating the compliance of proposed stationary sources with these ambient air quality standards. The ambient air quality impact assessment submitted for the HHSEGS project demonstrates that project impacts will be below the most stringent state and federal NO_2 standards, even when combined with existing background ambient NO_2 levels. On this basis, we

[6] Available at http://law.justia.com/codes/california/2010/hsc/42400-42410.html.
[7] The District's responsibility is limited to ambient air—that is, air in locations to which the public has access. Safety and health of onsite workers is within the jurisdiction of Cal/OSHA and is addressed in the Worker Safety and Fire Protection section of the CEC staff's Preliminary Staff Assessment.
[8] Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings.

have concluded that NOx emissions from the proposed project will not result in NO_2 concentrations that would cause damage to fruits, vegetables, or other crops or vegetation in the area.

Question 12.2: Are there species of fruits, vegetables or alternative types of vegetation that may be highly sensitive to nutrient absorption via roots or leaves as described in the "serpentine habitats" that may also be affected by annual or cumulative emissions from the proposed project? If so, what are they and what are the emissions impact levels that could trigger adverse effects?

Response: The District is not aware of any specific species of fruits, vegetables or alternative types of vegetation that may be highly sensitive to nutrient absorption via roots or leaves.

Question 12.3: As NOx builds within the soils in the area as well as other non-criteria pollutants and PAHs, (i.e., diesel particulate matter, non-criteria pollutants, etc.), over the life of the project, can these cumulative impacts cause our fruit trees or vegetable gardens from obtaining the nutrients they need to grow and/or produce fruit via the root systems, clog the leaves thereby preventing adequate photosynthesis, or potentially impact flower production that may in turn cause reductions in product yield or plant death?

Response: Oxides of nitrogen (NOx) are comprised of nitric oxide (NO) and nitrogen dioxide (NO_2), both of which are gases at standard conditions. Consequently, NOx emissions are not expected to build up within soils. In addition, please see the response to Question 12.1.

Question 12.4: Are there models for air emissions impacts on species-specific fruit/vegetable production and yield that could tell those in the community that produce food more about the potential direct, indirect and cumulative impacts to our food production over the life of the project?

Response: The District is not aware of any models for air emissions impacts on species-specific fruit/vegetable production and yield.

Question 12.5: If these models on food production exist, would the GBUAPCD recommend the applicant perform a modeling analysis for direct, indirect and cumulative impacts to community food production over the life of the project? If not, why not?

Response: The District uses models, analytical procedures and standards reviewed, approved and recommended by other air regulatory agencies, such as U.S. EPA, ARB and the Office of Environmental Health Hazard Assessment (OEHHA). Since the analyses prepared by the applicant, and reviewed by the District, do not indicate the potential to concentrations in excess of state or federal ambient air quality standards, the District does not believe such additional modeling analyses are necessary at this time.

Question 12.6: Are there other sources of air pollution, such as the fugitive dust example given by the Charpieds who claim they lost 30% of their crops through false pollination, which may also adversely impact local food production if the proposed project is approved?

Response: Since the analyses prepared by the applicant, and reviewed by the District, do not indicate the potential to concentrations in excess of state or federal ambient air quality standards, the District

does not believe that the proposed project will result in fugitive dust or other impacts that would adversely impact local food production.

Question 12.7: What does the GBUAPCD define as a "significant impact" on food production? 10% loss of crops/vegetation? 20% loss of crops/vegetation? 50% loss of crops/vegetation?

Response: Since the analyses prepared by the Applicant, and reviewed by the District, do not indicate the potential to concentrations in excess of state or federal ambient air quality standards, the District does not believe that the impacts from the proposed project would be sufficient to cause any loss of crops or vegetation in the area. This is the basis for the District's conclusion that the project will have no significant impact on food production in the area.

Question 12.8: Can single source emissions, cumulative emissions or other impacts from the proposed project reduce local pollinators (insects) to a significant degree that in turn would cause a reduction and/or prevent of pollination of food crops?

Response: The District is not aware of any evidence relating air pollution impacts at the levels anticipated from the proposed project to significant reductions in local pollinators.

13. DUST MITIGATION MEASURES

Question 13.1: What are the wind speeds that the GBUAPCD define as "normal" and what are the wind speeds that meet the criteria of "non-normal" that the proposed dust mitigation measures won't cover?

Response: "Normal" wind speeds are those that occur under meteorological conditions typical of the project site. The meteorological data set used in evaluating fugitive dust emissions from the project included wind speeds above 11.1 meters per second (25 mph).

Question 13.2: What mitigation measures, if any, does the GBUAPCD propose for dust impacts in "worse-case scenarios" that result from construction and/or operation activities such as wind events that result in wind speeds in excess of 25 mph?

Response: The District is proposing PDOC Condition 30, which incorporates by reference the CEC staff's proposed Condition AQ-SC4, Dust Plume Response Requirement. This condition would require the following procedures to be implemented in the event visible dust plumes are observed, such as during high wind events or any other conditions under which typical fugitive dust mitigation measures may not be adequate:

> "Observations of visible dust plumes that have the potential to be transported off the project site and within 400 feet upwind of any regularly occupied structures not owned by the project owner… indicate existing mitigation measures are not resulting in effective mitigation… The AQCMM or Delegate shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed:

Step 1: The AQCMM or Delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or Delegate shall direct implementation of additional methods of dust suppression if Step 1, specified above, fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM or Delegate shall direct a temporary shutdown of the activity causing the emissions if Step 2, specified above, fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or Delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The owner/operator may appeal to the CPM any directive from the AQCMM or Delegate to shut down an activity, if the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time."

Question 13.3: Will the water trucks be maintained at the site after construction is finished as a component of continued fugitive dust mitigation measures during normal operations over the life of the project? If not, what mitigation measures does the GBUAPCD recommend during the operational portion of the proposed project?

Response: While dust control measures will be required during project operation, it is unlikely that water trucks will be used for that purpose. The CEC staff has proposed Condition AQ-SC7, which would require the applicant to prepare and submit a site operations dust control plan. The plan would require the use of "durable non-toxic soil stabilizers on all regularly used unpaved roads and disturbed off-road areas within the project boundaries, and shall include the inspection and maintenance procedures that will be undertaken to ensure that the unpaved roads remain stabilized." The District expects that these soil stabilizers will be more effective than water in controlling fugitive dust during project operation.

14. LOCAL AIR QUALITY MONITORING/REPORTING

Question 14.1: What were the reasons why the GBUAPCD shut down the air quality monitoring station in Tecopa?

Response: The PM10 monitor in Tecopa was removed in June 2008 after completing a one year special purpose monitoring study to assess the sources and impacts of dust in the Tecopa area. The results of the study are summarized in the attached report (GBUAPCD, 2008).

Question 14.2: Does the GBUAPCD plan to resume air quality monitoring in Tecopa and/or Charleston View if the proposed project is approved?

Response: There are currently no plans to monitor ambient air quality in the Tecopa area.

Question 14.3: Why did the GBUAPCD refer the public to a site that has no viable information regarding air quality data anywhere near the proposed project area?

Response: The The site referred to was incorrect. For current PM10 concentrations in the District you can go to http://www.gbuapcd.org/data/pm10missioncontrol.htm. The District has no sites currently operating in the project area. The closest air monitoring sites to the project area are operated by the Nevada Division of Environmental Protection in Pahrump, NV and by the Clark County Department of Air Quality in the Las Vegas area. Current air quality information for Pahrump, NV can be found at http://nvair.ndep.nv.gov/ and for Clark County at http://ccaqapps5m.co.clark.nv.us/cgi-bin/aqi_map.pl.

Question 14.4: What specifically will the GBUAPCD independently do to monitor and protect local air quality and protect public trust values from possible adverse impacts of the proposed project?

Response: The District will enforce the conditions in the Authority to Construct and subsequent Permit to Operate through periodic inspections to ensure that the facility complies with all District, state and federal air quality regulations. In addition to inspections, the District will also respond to citizen complaints that might be triggered by uncontrolled fugitive dust that is seen crossing the property boundary.

Question 14.5: Since the GBUAPCD only had less than one-third of the funding it needed to address previously approved projects affecting local air quality within its District, wouldn't this reasonably suggest the GBUAPCD has previously failed to protect the public interest through inadequately evaluating and/or mitigating adverse air quality impacts within their jurisdiction?

Response: CAPP funds are separate from the budget for the District's permitting and enforcement activities. The CAPP funds ($6.5 million total) were paid by the City of Los Angeles to offset their PM10 emissions associated with missing dust control measure deadlines at Owens Lake, CA. For information on CAPP, go to http://capp.gbuapcd.org/. The District takes compliance with air quality regulations seriously. The District believes the existing funds for permitting and enforcement are sufficient to ensure that the proposed facility will comply with air quality regulations.

Question 14.6: If the proposed project results in adverse impacts to local air quality and the GBUAPCD already significantly lacks sufficient funding to address other air quality issues and concerns affecting their District, why do they believe - or better yet - why should the public believe the District has the resources necessary to insure compliance and standards are met or that they can appropriately mitigate adverse impacts in the proposed project area should they occur?

Response: See response to Question 14.5.

15. UPPER AIR DATA

Question 15.1: How does the Elko site conform to "adequate representation" of the proposed project site? Please be as specific as possible in terms of all relative factors and relationships as well as including any information that may indicate areas how the Elko site may not "adequately represent" the proposed project site.

Response: Meteorological data are required from two different types of monitoring locations: surface data that are representative of meteorological conditions near the earth, and upper air data that are representative of meteorological conditions well above the earth's surface. For the HHSEGS project, data from the Elko site were only used for upper air data.

There are many factors that go into a determination that meteorological data is "representative" of conditions in an area. Determinations are made on a case-by-case basis, following EPA guidance. EPA's meteorological monitoring guidance for permit modeling[9] states:

> "Issues of representativeness will always involve case-by-case subjective judgments; consequently, experts knowledgeable in meteorological monitoring and air quality modeling should be included in the site selection process. The following information is provided for consideration in such decisions…
>
> - Although proximity of the meteorological monitoring site is an important factor, representativeness is not simply a function of distance. In some instances, even though meteorological data are acquired at the location of the pollutant source, they may not correctly characterize the important atmospheric dispersion conditions; e.g., dispersion conditions affecting sources located on the coast are strongly affected by off-shore air/sea boundary conditions - data collected at the source would not always reflect these conditions.
>
> - Representativeness is a function of the height of the measurement. For example, one can expect more site-to-site variability in measurements taken close to the surface compared to measurements taken aloft. As a consequence, upper-air measurements are generally representative of much larger spatial domains then are surface measurements…"

There are few locations where upper air data are available; when looking at the representativeness of upper air data, the most important factors are distances relative to large urbanized areas and coastal zones. The Elko site would not be considered to adequately represent upper air conditions at the project site if it were located in a coastal area or in or near a large urban area because those locations are not climatically similar to the project site. However, the District and the ARB consider the Elko location to be climatically similar to the project site and therefore have determined that it is acceptable to use upper air data from Elko in the modeling analysis for the proposed project.

Question 15.2: What is the definition and parameters that qualifies a NWS station as being "nearby"?

[9]U.S. EPA, "Meteorological Monitoring Guidance for Regulatory Modeling Applications," EPA-454/R-99-005, February 2000; available at http://www.epa.gov/ttn/scram/guidance/met/mmgrma.pdf.

Response: The term "nearby" is not defined in EPA's modeling guidance. The most important determination is whether the meteorological data are representative. As stated above, determination of whether data are representative is made on a case by case basis. The monitoring guidance quoted above also states,

> "One would hope that such examples could be used in formulating objective criteria for use in evaluating representativeness in general. Though this remains a possibility, it is not a straight forward task - this is due in part to the fact that representativeness is an exact condition; a meteorological observation, data base, or monitoring site, either is, or is not representative within the context of whatever criteria are prescribed. It follows that, ***a quantitative method does not exist for determining representativeness absolutely***. Given the above, it should not be surprising that ***there are no generally accepted analytical or statistical techniques to determine representativeness of meteorological data or monitoring sites***."[emphasis added]

The representativeness of the meteorological data used in the ambient air quality modeling analysis is discussed in Section 5.1.4.5.4 of the AFC. As noted above, the District has reviewed the applicant's meteorological data and concluded that it is representative of conditions in the project area.

Question 15.3: Why didn't the GBUAPCD require the applicant to also use slightly older available meteorological data from the Desert Rock NWS station in order to ensure adequate representation of the Pahrump Valley was modeled for the proposed project site?

Response: The upper air data must be contemporaneous with the surface data to create a valid meteorological data set—data from different years cannot be combined. The applicant proposed, and the District concurred, that the most recent five-year set of meteorological data was preferable to older data, and that this was consistent with EPA guidance.

16. FINAL GEOTECHNICAL ANALYSIS: ADDITIONAL AIR-QUALITY MODELING

Question 16.1: If the GBUAPCD knows that a working knowledge of site-specific soil types are required to properly evaluate PM10 fugitive dust emissions, why wouldn't they require a site specific Final Geotechnical Report be prepared prior to authorizing a permit?

Response: The District requires more sophisticated monitoring techniques at Owens Lake because Owens Lake has a severe and longstanding PM_{10} fugitive dust problem that has been the subject of extensive study. Fugitive dust from construction projects are an entirely different and, in many respects, a much simpler class of fugitive dust problem and can be addressed through enforcement of Rule 401 (Fugitive Dust), which is intended to minimize the formation and transport of fugitive dust from anthropogenic activity, and Rule 402 (Nuisance), which is intended to minimize emissions that would cause injury, and through the imposition of the mitigation measures required by PDOC Condition 30.

Question 16.2: Wouldn't including the findings of the Final Geotechnical Report impact the emissions analysis of the projects emissions compliance as well as insuring appropriate dust mitigation measures

that are tailored for the soil types of the area in the Conditions of the Permit versus the current generic "one-size-fits-all" approach?

Response: The District does not believe it is necessary to have a Final Geotechnical Report or to prepare a more detailed analysis of potential fugitive dust emissions to ensure that appropriate dust mitigation measures are imposed for this project. The District and the CEC have proposed performance-based mitigation requirements. Please see the response to Question 13.2.

Question 16.3: What will be the GBUAPCD's proposed PM10 limits for the proposed project during construction and operations should it be approved?

Response: Please see the response to Questions 13.2 and 16.2.

Question 16.4: How does the GBUAPCD define and interpret "soil loss not within their jurisdiction"?

Response: The District's comment regarding soil loss and water erosion jurisdiction was made in response to questions in Cindy MacDonald's April 12, 2012 submittal regarding soil loss calculations presented in Appendix 5.11A of the applicant's AFC. The calculations in AFC Section 5.11 approach soil loss and water erosion from a different technical perspective than the analytical procedures used for air emissions calculations. The District did not review the assessment in Section 5.11.

Question 16.5: What is the GBUAPCD's definition of "emissions caused by the movement of soil" as defined in Rule 502.3.16 and how does it apply or not apply with respect to potential emissions resulting from the movement, replacement and/or stabilizing of soil as outlined in the applicant's Preliminary Geotechnical Report?

Response: District Rule 502 applies to agricultural operation sites (see Section 2.0 of the rule), and the purpose of the rule "is to limit fugitive dust emissions from agricultural operation sites…"(Section 1.0) The rule does not apply to activities or emissions from facilities other than agricultural operation sites.

17. VALLEY FEVER

Question 17.1: Is the GBUAPCD one of the regulatory agencies CEC Staff is referring to in the above quote?[10]

Response: Since the CEC staff wrote the section quoted, the GBUAPCD is not aware of which regulatory agencies the CEC staff is referring to. The GBUAPCD has not issued such recommendations.

[10] The referenced quote is found on page 4.8-13, of the Air Quality section of CEC Staff's Preliminary Staff Assessment of the project, and states: "Staying indoors during dust storms and closing all doors to avoid dust inhalation are measures recognized by the regulatory agencies as effective against Valley Fever in endemic areas where the risk of human exposure cannot be eliminated altogether."

Question 17.2: If not, does the GBUAPCD have any regulations, policies, or adopted guidelines that protect or advocate protection of public health within its jurisdiction from being infected due to air borne contamination resulting from soil movement, fugitive dust or other soil disturbances in the project area?

Response: The District has Rule 401 (Fugitive Dust), which is intended to minimize the formation and transport of fugitive dust from anthropogenic activity, and Rule 402 (Nuisance), which is intended to minimize emissions that would cause injury. Both of these rules are intended to protect public health.

Question 17.3: What regulatory agencies is the GBUAPCD aware of that advocate the affected public becoming "shut ins" in their own homes in efforts not to breath the local air in order to prevent fungal inhalation and consequently, illness?

Response: The District is not aware of any regulatory agencies that advocate the public becoming shut-ins.

Question 17.4: Does the GBUAPCD agree with the CEC Staff's assessment of how the local population can protect themselves from Valley Fever once construction on the proposed project begins? Please explain GBUAPCD's position as to why or why not they believe this is a feasible mitigation measure and what measures (if any) would they add for consideration.

Response: The CEC staff's public health assessment suggests that on-site construction workers at the HHSEGS site could be exposed to fungal spores, if present on the site, from wind-blown dust generated during project construction, and indicates that the applicant's dust suppression plans are considered adequate to minimize any risk of on-site construction workers catching Valley Fever. The CEC staff does not suggest that project construction would expose the local population to Valley Fever. The District agrees with the CEC staff that the applicant's dust suppression plans are adequate to minimize any risk to construction workers. The District does not believe that construction or operation of the project will expose the public to the fungal spores that cause Valley Fever, and does not believe that any additional, specific mitigation measures are necessary.

18. CONSTRUCTION DUST: T&E SPECIES

Question 18.1: Does the GBUAPCD have any similar Rules that mandate construction emissions must not be in conflict with the California or Federal Endangered Species Acts? If so, which ones?

Response: No, the District has no similar rules.

Question 18.2: Are there any studies that have analyzed the impacts of construction emissions, fugitive dust, or chemical dust suppressants in relation to respiratory trends and impacts to Desert Tortoise that the GBUAPCD is aware of and might apply to the project?

Response: No, the District is not aware of any of these types of studies.

19. COMMUNITY HEALTH RISK ASSESSMENT

Question 19.1: What does this chart reflect and model besides cancer risks?

Response: The table shows acute (short-term) risks and chronic (long-term) non-cancer risks, in addition to cancer risks.

Question 19.2: What chemicals (by specific component) and emissions does this chart represent under "Acute Health Hazard Index" and "Chronic Health Hazard Index"?

Response: The chemicals included in the health risk assessment are shown in Table 5.9-4, under the heading, "Non-criteria Pollutants" (reproduced below) and Table 5.9-5 of the AFC.[11] Emissions are quantified in Table 5.1-30 (Summary of Toxic Air Contaminant Emissions from Project Operation).

Non-criteria Pollutants
Acetaldehyde
Acrolein
Benzene
Ethylbenzene
Formaldehyde
Hexane
Naphthalene
PAHs
Propylene
Toluene
Xylene
Diesel Particulate Matter

Question 19.3: Does it incorporate just carcinogenic risks exclusively or does it incorporate other health risks such as respiratory conditions? If so, which ones?

Response: As indicated in the response to Question 19.1, the screening health risk includes long-term (chronic) and short-term (acute) non-carcinogenic health impacts from non-carcinogenic emissions. Chronic and acute impacts include respiratory and other non-cancer health effects. Additional information can be found in Sections 5.9.4.4.1 and 5.9.45, 5.1.4.6 and Appendix 5.1E of the AFC.

Question 19.4: Did the applicant model or provide any Health Risk of Diesel Exhaust assessment for potential respiratory impacts or other health impacts to workers or local populations resulting from diesel emissions besides cancer? If not, why not?

[11] Polycyclic aromatics include numerous individual compounds. The seven PAHs that are associated with natural gas combustion are benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene. See Table 5.1E-2R of the boiler optimization submittal.

Response: Yes, potential health risks from diesel exhaust particulate were also considered in the evaluation of chronic risks. See Table 5.9-5 of the AFC.

Question 19.5: Did the GBUAPCD request any additional Health Screening Risks of Diesel Exhaust from the applicant besides the supplied cancer risk assessment or consult with the applicant in any way prior to the applicant initiating the parameters for the Health Screening Risk modeling? If not, why not?

Response: The GBUAPCD did not request any additional health risk assessment of diesel exhaust emissions beyond the cancer and chronic risk assessments presented in the AFC. The applicant consulted with the District prior to preparing the screening health risk assessment. Prior to preparing the analyses, the applicant submitted a modeling protocol to the District which addressed the procedures to be followed in preparing the health risk assessment. In addition to describing the modeling procedures and receptor grid layout that were proposed to be used in the screening health risk assessment, the protocol stated that the risk assessment would:

> "…assess cancer risk as well as non-cancer chronic and acute health hazards. Because the TACs emitted by the project include PAHs, the HRA will address not only the inhalation pathway, but also the following three pathways: dermal absorption, soil ingestion, and mother's milk ingestion." (p. 20)

The protocol further stated that "[c]ombustion Diesel PM_{10} emission impacts from construction equipment will be evaluated to demonstrate that the cancer risk from construction activities will be below ten in one million at all receptors." (p. 21)

The District reviewed the protocol and determined that the procedures were consistent with ARB and OEHHA guidance.

Question 19.6: Where is the "produce ingestion pathway" referred to in the GBUAPCD's response or in the AFC files or subsequent documents?

Response: As indicated in our response to Question 9 of Cindy MacDonald's April 2012, April submittal, the screening health risk assessment did not include the potential for exposure through the produce pathway. The District believes that the project will have no significant impacts on local food production for residents in Charleston View. The applicant's screening health risk assessment showed that the maximum potential cancer risk at any residential receptor is well below one in one million. The "Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments,"[12] which is the regulatory guidance used for preparation of screening health risk assessments, indicates that the only substance potentially emitted from the proposed project that may have health effects through produce ingestion is PAHs (see Table 5.1 of the Hot Spots Guidance Manual). As shown in Table 5.1E-2R of the AFC, PAH emissions from the project will be orders of magnitude below the emissions of other noncriteria pollutants, so we believe that consideration of the produce ingestion pathway for PAHs will not affect our conclusion that emissions from the project will not pose a health risk to the community.

[12] Office of Environmental Health Hazard Assessment, "Air Toxics Hot Spots Program Risk Assessment Guidelines: The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments," August 2003, available at *http://oehha.ca.gov/air/hot_spots/pdf/HRAguidefinal.pdf.*

APPENDIX E: Boiler Optimization Tables

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Table 5.1B-2R

Emissions and Operating Parameters for Auxiliary Boilers[1]

Hidden Hills Solar Electric Generating System

Revised April 2012

Boiler Emission Characteristics			
		Normal	Startup
Heat Input, MMBtu/hr (HHV)		249.0	31
Boiler Rating, lb/hr		*174,000*	--
NOx, ppmvd @ 3% O2		9	72
CO, ppmvd @ 3% O2		25	200
VOC (as CH4), ppmvd @ 3% O2		12.6	101
NOx (as NO2), lb/hr		2.74	2.74
NOx, lb/MMBtu		0.0110	0.088
CO, lb/hr		4.55	4.55
CO, lb/MMBtu		0.0183	0.146
VOC (as CH4), lb/hr		1.34	1.34
VOC, lb/MMBtu		0.0054	0.043
PM10, lb/hr		1.25	0.31
PM10, lb/MMBtu		0.005	0.01
SO2, grains/100 scf		0.75	0.75
SO2, lb/hr		0.52	0.07
SO2, lb/MMBtu		0.0021	0.0021
Boiler Stack Parameters			
Exhaust temp	deg F	*300*	300
Exhaust volume	cfm	*72,426*	10,001
Stack diameter	inches	*66*	*66*
Exhaust velocity	ft/sec	*51*	*7.0*

Note:

1. These 249 MMBtu/hr boilers were called "startup boilers" in the original project design.

Table 5.1B-3R
Emissions and Operating Parameters for Nighttime Preservation Boilers
Hidden Hills Solar Electric Generating System
Revised April 2012

Boiler Emission Characteristics			
		Normal	**Cold Startup**
Heat Input, MMBtu/hr (HHV)		*15*	*1.9*
Boiler Rating, lb/hr		*10,000*	--
NOx, ppmvd @ 3% O2		9	72
CO, ppmvd @ 3% O2		50	400
VOC (as CH4), ppmvd @ 3% O2		10	80
NOx (as NO2), lb/hr		*0.17*	*0.17*
NOx, lb/MMBtu		0.0113	0.091
CO, lb/hr		*0.55*	*0.55*
CO, lb/MMBtu		0.0366	0.292
VOC (as CH4), lb/hr		*0.08*	*0.08*
VOC, lb/MMBtu		0.0053	0.043
PM10, lb/hr		*0.08*	*0.02*
PM10, lb/MMBtu		0.005	0.01
SO2, grains/100 scf		0.75	0.75
SO2, lb/hr		*0.03*	*0.004*
SO2, lb/MMBtu		0.0021	0.0021
Boiler Stack Parameters			
Exhaust temp	deg F	*300*	*300*
Exhaust volume	cfm	*4,363*	*602*
Stack diameter	inches	*18*	*18*
Exhaust velocity	ft/sec	*41*	*6*

Table 5.1B-4R
Diesel Emergency Generators, Power Blocks
Hidden Hills Solar Electric Generating System
Revised April 2012

Engine				
Engine Mfr		Caterpillar		
Model		*3516C or equivalent*		
Emissions Cert		Tier 2		
Useable Horsepower	hp	*3633*		
Generator Power Output	kW	2500		
Fuel		CA Diesel		
Specific Gravity		0.825		
Fuel Sulfur Content	wt %	0.0015%		
Fuel Consumption	gph	175		
	MMBtu/hr	23.8		
	Btu/bhp-hr	*6,551*		
Emissions				
NOx	g/bhp-hr	*4.8*		
CO	g/bhp-hr	*2.6*		
VOC	g/bhp-hr	*0.1669*		
PM10	g/bhp-hr	*0.15*		
NOx	lb/hr	*38.4*	lb/yr	*1922*
CO	lb/hr	*20.8*	lb/yr	*1041*
VOC	lb/hr	*1.3*	lb/yr	*67*
PM10	lb/hr	*1.2*	lb/yr	*60*
SO2	lb/hr	0.04	lb/yr	2
Exhaust Parameters				
Exhaust temp	deg F	*925*		
Stack height	feet	18		
Exhaust volume	cfm	*19,600*		
Stack diameter	inches	*18.0*		
Exhaust velocity	ft/sec	*185*		

Daily ops:	0.5	hrs/day per engine
Annual ops	50	hrs/yr per engine

Table 5.1B-5R
Emergency Diesel Generator, Common Area
Hidden Hills Solar Electric Generating System
Revised April 2012

Engine		
Engine Mfr		Caterpillar
Model		C9 ATAAC *or equivalent*
Emissions Cert		Tier 3
Useable Horsepower	hp	*398*
Generator Power Output	kW	250
Fuel		CA Diesel
Specific Gravity		0.825
Fuel Sulfur Content	wt %	0.0015%
Fuel Consumption	gph	*20*
	MMbtu/hr	2.7
	Btu/bhp-hr	*6,834*

Emissions				
NOx	g/bhp-hr	*3*		
CO	g/bhp-hr	*2.6*		
VOC	g/bhp-hr	*0.1669*		
PM10	g/bhp-hr	*0.15*		
NOx	lb/hr	*2.6*	lb/yr	*132*
CO	lb/hr	*2.28*	lb/yr	*114*
VOC	lb/hr	*0.15*	lb/yr	*7*
PM10	lb/hr	*0.13*	lb/yr	*7*
SO2	lb/hr	0.004	lb/yr	0

Exhaust Parameters		
Exhaust temp	deg F	*855*
Stack height	feet	18
Exhaust volume	cfm	*2,250*
Stack diameter	inches	*8*
Exhaust velocity	ft/sec	*107*

Daily ops:	0.5	hrs/day per engine
Annual ops	50	hrs/yr per engine

Table 5.1B-6R
Diesel Fire Pump Engines, Power Blocks
Hidden Hills Solar Electric Generating System
Revised April 2012

Engine				
Engine Mfr		*Cummins*		
Model		*CFP7E-F30*		
		or equivalent		
Emissions Cert		Tier 3		
Useable Horsepower	hp	*200*		
Pump Speed	rpm	*2100*		
Fuel		CA Diesel		
Specific Gravity		0.825		
Fuel Sulfur Content	wt %	0.0015%		
Fuel Consumption	gph	*12.0*		
	MMbtu/hr	*1.6*		
	Btu/bhp-hr	*8,160*		
Emissions				
NOx	g/bhp-hr	*3.0*		
CO	g/bhp-hr	*2.6*		
VOC	g/bhp-hr	*0.1836*		
PM10	g/bhp-hr	*0.15*		
NOx	lb/hr	*1.3*	lb/yr	*66*
CO	lb/hr	*1.15*	lb/yr	*57*
VOC	lb/hr	*0.08*	lb/yr	*4*
PM10	lb/hr	*0.07*	lb/yr	*3*
SO2	lb/hr	*0.003*	lb/yr	*0.1*
Exhaust Parameters				
Exhaust temp	deg F	*975*		
Exhaust height	feet	15		
Exhaust volume	cfm	*1,650*		
Stack diameter	inches	4		
Exhaust velocity	ft/sec	*315*		

Daily ops:	0.5	hrs/day per engine
Annual ops	50	hrs/yr per engine

Table 5.1B-7R
Diesel Fire Pump Engine, Common Area
Hidden Hills Solar Electric Generating System
Revised April 2012

Engine				
Engine Mfr/Model		*Cummins CFP7E-F30 or equivalent*		
Emissions Cert		Tier 3		
Useable Horsepower	hp	*200*		
Pump Speed	rpm	*2100*		
Fuel		CA Diesel		
Specific Gravity		0.825		
Fuel Sulfur Content	wt %	0.0015%		
Fuel Consumption	gph	12.0		
	MMbtu/hr	1.6		
	Btu/bhp-hr	*8,160*		
Emissions				
NOx	g/bhp-hr	*3.0*		
CO	g/bhp-hr	*2.6*		
VOC	g/bhp-hr	*0.1836*		
PM10	g/bhp-hr	*0.15*		
NOx	lb/hr	*1.3*	lb/yr	*66*
CO	lb/hr	*1.15*	lb/yr	*57*
VOC	lb/hr	*0.08*	lb/yr	*4*
PM10	lb/hr	*0.07*	lb/yr	*3*
SO2	lb/hr	*0.003*	lb/yr	*0.1*
Exhaust Parameters				
Exhaust temp	deg F	*975*		
Exhaust height	feet	15		
Exhaust volume	cfm	*1,650*		
Stack diameter	inches	4		
Exhaust velocity	ft/sec	*315*		

Daily ops:	0.5	hrs/day per engine
Annual ops	50	hrs/yr per engine

Table 5.1B-8R
Typical Annual Operating Schedule, Each Plant
Hidden Hills Solar Electric Generating System
Revised April 2012

Auxiliary boiler operation[1]	**Summer**	**Winter**	
operation , hours/day[2] (average)	5	5	
Equivalent full-load hours/yr[2]			**1,100**
Expected startup hours/yr			**865**

Nighttime boiler operation	**Summer**	**Winter**	
operation , hours/day[2] (average)	12	16	
Equivalent full-load hours/yr[2]			**4,780**
Expected startup hours/yr			**345**

Notes:
1. These 249 MMBtu/hr boilers were called "startup boilers" in the original project desigr
2. Hours shown are equivalent full load hours; boilers may operate more hours on some days and/or at lower loads. See text.

Table 5.1B-9R
Calculation of Daily and Annual Fuel Use
Hidden Hills Solar Electric Generating System
Revised April 2012

	Number of Units	Operating Hours, Each Unit						Startup Hours, Each Unit	Rated Hourly Fuel Use, MMBtu
		Max Equivalent Full-load hrs/day	Max Startup hrs/day	hrs/Q1	hrs/Q2	hrs/Q3	hrs/Q4		
Auxiliary Boilers	2	*5*	*7.5*	*275*	*275*	*275*	*275*	*865*	249.0
Nighttime Boilers	2	*16*	*1*	*1195*	*1195*	*1195*	*1195*	*345*	*15.0*
Em Gens, Power Blocks	2	0.5	--	50	50	50	50	*n/a*	23.8
Em Gen, Common Area	1	0.5	--	50	50	50	50	*n/a*	2.7
Fire Pump Engines, Power Blocks	2	0.5	--	50	50	50	50	*n/a*	1.6
Fire Pump Engine, Common Area	1	0.5	--	50	50	50	50	*n/a*	1.6

	Total Fuel Use, all units							
	MMBtu/hr	MMBtu/day	MMBtu/Q1	MMBtu/Q2	MMBtu/Q3	MMBtu/Q4	Startup, MMBtu/yr	Total MMBtu/yr
Auxiliary Boilers	**498.0**	*2,960*	*136,952*	*136,952*	*136,952*	*136,952*	*53,847*	*601,700*
Nighttime Boilers	***30.0***	*480*	*35,851*	*35,851*	*35,851*	*35,851*	*1,294*	*144,700*
Em Gens, Power Blocks	**23.8**	23.8	2,380	2,380	2,380	2,380	*n/a*	9,520
Em Gen, Common Area	**1.4**	1.4	136	136	136	136	*n/a*	550
Fire Pump Engines, Power Blocks	***1.6***	*1.6*	*163*	*163*	*163*	*163*	*n/a*	*660*
Fire Pump Engine, Common Area	***0.8***	*0.8*	*82*	*82*	*82*	*82*	*n/a*	*330*
Total								*757,500*
Total natural gas		***3,440.0***						***746,400***
Total diesel								***11,100***

Table 5.1B-10R
Calculation of Wet Surface Air Cooler Emissions
Hidden Hills Solar Electric Generating System
Revised April 2012

Typical Worst-Case Design Parameters	
Water Flow Rate, 10E6 lbm/hr	2.00
Water Flow Rate, gal/min	*4,000*
Drift Rate, %	0.0005
Drift, lbm water/hr	10.00
PM10 Emissions based on TDS Level	
TDS level, ppm	*1500*
PM10, lb/hr	*0.015*
PM10, lb/day	*0.18*
PM10, tpy	*0.015*
Exhaust Parameters	
Exhaust Temp, deg F	*80.0*
Volumetric flow rate (total), ft3/min	*590,000.0*
Fan diameter, ft	*9*
No. of fans	*4*

Based on 2,000 hrs/yr
12 hrs/day

Table 5.1B-11
Emissions from Mirror Cleaning Activities
Hidden Hills Solar Electric Generating System
Revised April 2012

Pollutant	Emission Factor	Emissions (lb/year) HHS 1	HHS 2
Larger vehicles:	VMT/yr	18,900	18,900
Far From Tower (FFT) MWMs	gal/yr	899,360	899,360
NOx (g/mi)	2.332	97	97
VOC (g/mi)	0.951	40	40
SO2 (lb/1000 gal)	0.21	189	189
CO (g/mi)	2.027	84	84
(g/mi)	0.038	2	2
PM10 (road dust) (lb/VMT)	0.30	5,632	5,632
PM2.5 (road dust) (lb/VMT)	0.03	563	563
Smaller vehicles:	VMT/yr	4,000	4,000
Near Tower (NT) MWMs	Gal/yr	64,240	64,240
NOx (g/bhp-hr)	0.276	644	644
VOC (g/bhp-hr)	0.1314	307	307
SO2 (lb/1000 gal)	0.21	13	13
CO (g/bhp-hr)	0.087	203	203
PM10/PM2.5 (combustion) (g/bhp-hr)	0.0092	21	21
PM10 (road dust) (lb/VMT)	0.17	684	684
PM2.5 (road dust) (lb/VMT)	0.02	68	68

Total, all activities	HHS1 lb/yr	HHS2 lb/yr	Total lb/yr	lb/hr	lb/day	ton/yr
NOx	741	741	1,482	0.2	4.1	0.7
VOC	346	346	693	0.1	1.9	0.3
SO2	202	202	405	0.06	1.1	0.20
CO	287	287	575	0.1	1.6	0.3
PM10/PM2.5 (combustion)	23	23	46	0.0	0.1	0.02
PM10 (road dust)	6,316	6,316	12,632	1.7	34.6	6.3
PM2.5 (road dust)	632	632	1,263	0.2	3.5	0.6
DPM	23	23	46	0.01	0.1	0.02

Greenhouse Gas Emissions (GHG)	lb/yr	ton/yr
FFT (Onroad) vehicles	39,474,747	19,737
NT (Offroad) vehicles	2,819,625	1,410

Notes:

1. Emission factors for onroad vehicles from ARB EMFAC Emission Rates Database, for Inyo County, 2013MY, T7 single vehicle at 10 mph speed (available at http://www.arb.ca.gov/jpub/webapp//EMFAC2011WebApp/rateSelectionPage_1.jsp)
2. Emission factors for nonroad vehicles from EPA Nonroad Model documentation, Tier 4 engines: 100 to 175 bhp for NT vehicles (available at http://www.epa.gov/otaq/models/nonrdmdl/nonrdmdl2010/420r10018.pdf)
2. Assume all combustion PM10 is <2.5 um in size
3. Assume all engines are diesel fueled so all combustion PM is DPM
4. GHG emission factors from CARB Regulation for the Mandatory reporting of Greenhouse Gas Emissions, December 2, 2008; distillate fuel

5. Unpaved road dust factors from construction emissions calculations; 90% control

CO2 EF, kg/MMBtu	CH4 EF, kg/MMBtu	N2O EF, kg/MMBtu	GWP for CO2	GWP for CH4	GWP for N2O	Weighted CO2e, kg/MMBtu	Weighted CO2e, lb/MMBtu	Diesel HHV, MMBtu/gal	Weighted CO2e, lb/1000 gal
73.1	0.003	0.0006	1	21	310	73.349	161.4	0.136	21946.02

Table 5.1B-12R
Calculations for Maximum Hourly Criteria Pollutant Emissions
Hidden Hills Solar Electric Generating System
Revised April 2012

Equipment	Hourly Emission Rates, Each Unit					Heat Input, MMBtu/hr
	NOx	SOx	CO	VOC	PM10/PM2.5	
Auxiliary Boilers						
Normal operation	2.74	0.52	4.55	1.34	1.25	*249*
Cold startup	*2.74*	0.07	*4.55*	*1.34*	0.31	*31*
Nighttime Preservation Boilers						
Normal operation	0.17	0.03	0.55	0.08	0.08	*15.00*
Cold startup	*0.17*	0.004	*0.55*	*0.08*	0.02	*1.9*
Power Block Emergency Generators	38.44	0.04	20.82	1.34	1.20	*23.8*
Common Area Emergency Generator	2.63	0.004	2.28	0.15	0.13	*2.7*
Power Block Fire Pump Engines	*1.32*	*0.003*	*1.15*	*0.08*	*0.07*	*1.6*
Common Area Fire Pump Engine	*1.32*	*0.003*	*1.15*	*0.08*	*0.07*	*1.6*
WSAC	0	0	0	0	*0.015*	*0*

Maximum Hourly Emissions, Normal Boiler Operation

Equipment	Total Number of Units (1)	Max Hour	Heat Input, MMBtu/hr	Emissions, pounds/hr					
				NOx	SO2	CO	VOC	PM10	PM2.5
Auxiliary Boilers	2	1	498.0	5.5	1.0	9.1	2.7	2.5	2.5
Nighttime Preservation Boilers	2	1	30.0	0.3	0.1	1.1	0.2	0.2	0.2
Power Block Emergency Generators	2	0.5	23.8	38.4	0.0	20.8	1.3	1.2	1.2
Common Area Emergency Generator	1	0.5	1.4	1.3	0.0	1.1	0.1	0.1	0.1
Power Block Fire Pump Engines	2	0.5	1.6	1.3	0.0	1.1	0.1	0.1	0.1
Common Area Fire Pump Engine	1	0.5	0.8	0.7	0.0	0.6	0.0	0.0	0.0
WSAC	2	1	0	0.0	0.0	0.0	0.0	3.0E-02	3.0E-02
Total Emissions, lb/hr			**555.6**	**47.6**	**1.2**	**33.9**	**4.4**	**4.0**	**4.0**

Maximum Daily Emissions, Normal Operating Day

Equipment	Total Number of Units (1)	Operating Hours/Day	Heat Input, MMBtu/day	Emissions, pounds/day					
				NOx	SO2	CO	VOC	PM10	PM2.5
Auxiliary Boilers-- normal operations	2	5	2,490	27.4	5.2	45.5	13.4	12.5	12.5
Auxiliary Boilers-- startup	2	2.5	156	13.7	0.4	22.8	6.7	1.6	1.6
Nighttime Preservation Boilers	2	16	480	5.4	1.0	17.6	2.6	2.4	2.4
Nighttime Pres. Boilers-- startup	2	1	4	0.3	0.0	1.1	0.2	0.0	0.0
Power Block Emergency Generators	2	0.5	24	38.4	0.0	20.8	1.3	1.2	1.2
Common Area Emergency Generator	1	0.5	1.4	1.3	0.0	1.1	0.1	0.1	0.1
Power Block Fire Pump Engines	2	0.5	1.6	1.3	0.0	1.1	0.1	0.1	0.1
Common Area Fire Pump Engine	1	0.5	0.8	0.7	0.0	0.6	0.0	0.0	0.0
WSAC	2	12	0	0.0	0.0	0.0	0.0	0.36	0.36
Total, Boilers			3,129.4	46.9	6.6	86.9	22.8	16.4	16.4
Total, Engines			27.6	41.7	0.0	23.7	1.5	1.4	1.4
Total Emissions, lb/day			**3,157.0**	**88.6**	**6.7**	**110.6**	**24.4**	**18.2**	**18.2**

Maximum Daily Emissions, Auxiliary Boiler Cold Startup Day

Equipment	Total Number of Units (1)	Operating Hours/Day	Heat Input, MMBtu/day	Emissions, pounds/day					
				NOx	SO2	CO	VOC	PM10	PM2.5
Auxiliary Boilers-- normal operations	2	5	2,490	27.4	5.2	45.5	13.4	12.5	12.5
Auxiliary Boilers-- startup	2	7.5	467	41.1	1.1	68.3	20.1	4.7	4.7
Nighttime Preservation Boilers	2	16	480	5.4	1.0	17.6	2.6	2.4	2.4
Nighttime Pres. Boilers-- startup	2	1	4	0.3	0.0	1.1	0.2	0.0	0.0
Power Block Emergency Generators	2	0.5	24	38.4	0.0	20.8	1.3	1.2	1.2
Common Area Emergency Generator	1	0.5	1.4	1.3	0.0	1.1	0.1	0.1	0.1
Power Block Fire Pump Engines	2	0.5	1.6	1.3	0.0	1.1	0.1	0.1	0.1
Common Area Fire Pump Engine	1	0.5	0.8	0.7	0.0	0.6	0.0	0.0	0.0
WSAC	2	12	0	0.0	0.0	0.0	0.0	0.36	0.36
Total, Boilers			3,441	74.3	7.4	132.5	36.2	19.6	19.6
Total, Engines			27.6	41.7	0.0	23.7	1.5	1.4	1.4
Total Emissions, lb/day			**3,468.3**	**116.0**	**7.4**	**156.1**	**37.8**	**21.3**	**21.3**

Maximum Annual Emissions

Equipment	Total Number of Units (1)	Operating Hours/Yr	Startup Hours/Yr	Emissions, tons/yr					
				NOx	SO2	CO	VOC	PM10	PM2.5
Auxiliary Boilers	2	1100	865	5.4	0.6	8.9	2.6	1.6	1.6
Nighttime Preservation Boilers	2	4780	345	0.9	0.2	2.8	0.4	0.4	0.4
Power Block Emergency Generators	2	50	0	1.9	0.002	1.0	0.07	0.06	0.06
Common Area Emergency Generator	1	50	0	0.1	1.1E-04	0.06	0.004	0.003	0.003
Power Block Fire Pump Engines	2	50	0	0.1	1.3E-04	0.06	0.004	0.003	0.003
Common Area Fire Pump Engine	1	50	0	0.03	6.3E-05	0.03	0.002	0.002	0.002
WSAC	2	2000	0	0.0	0.0	0.0	0.0	0.03	0.03
Total Emissions, tons/yr				**8.3**	**0.8**	**12.9**	**3.1**	**2.1**	**2.1**

Note:

1. Total, 2x250 MW plants.

Table 5.1B-13R
Greenhouse Gas Emissions Calculations
Hidden Hills Solar Electric Generating System
Revised April 2012

Unit	Total Number of Units (1)	Rated Heat Input, MMBtu/hr	Rated Capacity, MW (Note 1)	Operating Hours per year	Startup Hours per year	Fuel Use, MMBtu/yr (1)	Estimated Gross MWh	Maximum Emissions, metric tonnes/yr				Max. Emissions, tons/yr CO2e	CO2 lb/MWh
								CO2	CH4	N2O	SF6		
Auxiliary Boilers	2	249	n/a	1100	865	601,700	n/a	31,812	0.54	0.06	--		
Nighttime Preservation Boilers	2	15.0	n/a	4780	345	144,700	n/a	7,650	0.13	0.01	--		
Power Block Emergency Generators	2	23.8	n/a	200	n/a	9,520	n/a	696	0.03	0.01	--		
Common Area Emergency Generator	1	2.72	n/a	200	n/a	550	n/a	40	1.7E-03	3.3E-04	--		
Power Block Fire Pump Engines	2	1.63	n/a	200	n/a	660	n/a	48	2.0E-03	4.0E-04	--		
Common Area Fire Pump Engine	1	1.63	n/a	200	n/a	330	n/a	24	9.9E-04	2.0E-04	--		
WSACs	2	--	n/a	2000	n/a	0	n/a	0	0.00	0.00	--		
Circuit breakers	4	--	n/a	8760	n/a	0	n/a	--	--	--	2.0E-03		
Total			--	--		757,500	1,432,000	40,271	0.70	0.08	2.0E-03		
CO2-Equivalent								40,271	14.80	25.20	47.82	44,394	62

Natural Gas GHG Emission Rates (2)

Fuel	Emission Factors, kg/MMBtu			Emission Factor
	CO2 (3)	CH4 (4)	N2O (5)	SF6 (6)
Natural Gas	52.870	9.00E-04	1.00E-04	n/a
Diesel Fuel	73.100	3.00E-03	6.00E-04	n/a
Global Warming Potential (4)	1	21	310	23,900

Notes:

1. Rated capacity and heat input from heat balance at annual average conditions, annual fuel use and gross generation based on 100% capacity factor.
2. Calculation methods and emission factors from ARB, "Regulation for the Mandatory Reporting of Greenhouse Gas Emissions," December 5, 2007 (Staff's Suggested Modifications to the Originally Proposed Regulation Order Released October 19, 2007). http://www.arb.ca.gov/cc/ccei/reporting/GHGReportRegUpdate12_05_07.pdf
3. Appendix A, Table 4; heat content 1000 to 1025 Btu/scf.
4. Appendix A, Table 6.
5. Appendix A, Table 2.

6. Sulfur hexafluoride (SF6) will be used as an insulating medium in four new 230 kV breakers in the common area and in one generator circuit breaker (GCB) at each power block. Estimates of the SF6 contained in a 230 kV breaker range from 161 to 208 lbs, depending on the manufacturer. The GCBs will each contain 24.2 lb of SF6. The IEC standard for SF6 leakage is less than 0.5%; the NEMA leakage standard for new circuit breakers is 0.1%. A maximum leakage rate of 0.5% per year is assumed.

Table 5.1B-15R
Calculation of Noncriteria Pollutant Emissions from Auxiliary Boilers
Hidden Hills Solar Electric Generating System
Revised April 2012

Compound	Emission Factor, lb/MMcf (1)	Maximum Hourly Emissions, lb/hr per boiler(2)	Annual Emissions (3)	
			tpy per boiler	tpy, all boilers
Propylene	1.55E-02	3.79E-03	*2.29E-03*	*4.58E-03*
Hazardous Air Pollutants				
Acetaldehyde	9.00E-04	2.20E-04	*1.33E-04*	*2.65E-04*
Acrolein	8.00E-04	1.95E-04	*1.18E-04*	*2.36E-04*
Benzene	1.70E-03	4.15E-04	*2.51E-04*	*5.01E-04*
Ethylbenzene	2.00E-03	4.88E-04	*2.95E-04*	*5.90E-04*
Formaldehyde	3.60E-03	8.79E-04	*5.31E-04*	*1.06E-03*
Hexane	1.30E-03	3.17E-04	*1.92E-04*	*3.83E-04*
Naphthalene	3.00E-04	7.32E-05	*4.42E-05*	*8.85E-05*
PAHs (except naphthalene) (4)	1.00E-04	2.44E-05	*1.47E-05*	*2.95E-05*
Toluene	7.80E-03	1.90E-03	*1.15E-03*	*2.30E-03*
Xylene	5.80E-03	1.42E-03	*8.55E-04*	*1.71E-03*
Total HAPs		5.93E-03	*3.58E-03*	*7.17E-03*

Notes:

(1) All factors from Ventura County APCD, "AB2588 Combustion Emission Factors," Natural Gas Fired External Combustion Equipment >100 MMBtu/hr. Available at http://www.vcapcd.org/pubs/Engineering/AirToxics/combem.pdf

(2) Based on maximum hourly boiler heat input of 0.2441 MMscf/hr

(3) Based on total annual heat input of *295.0* MMscf/yr

(4) Total PAHs, excluding naphthalene. See speciation below.

(5) Emission factors for individual PAHs obtained from AP-42, Table 1.4-3, then adjusted proportionally so that total of "Adjusted EF" equals Total PAH EF of 1.0 E-04 lb/MMscf per Ventura County factors.

Speciated PAHs (except naphthalene)

	Mean EF (Note 1)	Adjusted EF (Note 5)	Emissions	
			lb/hr	tpy
Benzo(a)anthracene	1.80E-06	1.58E-05	3.85E-06	2.33E-06
Benzo(a)pyrene	1.20E-06	1.05E-05	2.57E-06	1.55E-06
Benzo(b)fluoranthrene	1.80E-06	1.58E-05	3.85E-06	2.33E-06
Benzo(k)fluoranthrene	1.80E-06	1.58E-05	3.85E-06	2.33E-06
Chrysene	1.80E-06	1.58E-05	3.85E-06	2.33E-06
Dibenz(a,h)anthracene	1.20E-06	1.05E-05	2.57E-06	1.55E-06
Indeno(1,2,3-cd)pyrene	1.80E-06	1.58E-05	3.85E-06	2.33E-06
Total	1.14E-05	1.00E-04	2.44E-05	1.47E-05

Table 5.1B-16R
Calculation of Noncriteria Pollutant Emissions from Nighttime Preservation Boilers
Hidden Hills Solar Electric Generating System
Revised April 2012

Compound	Emission Factor, lb/MMscf (1)	Maximum Hourly Emissions, lb/hr per boiler(2)	Annual Emissions (3)	
			tpy per boiler	tpy, all boilers
Propylene	5.30E-01	*7.79E-03*	*1.88E-02*	*3.76E-02*
Hazardous Air Pollutants				
Acetaldehyde	3.10E-03	*4.56E-05*	*1.10E-04*	*2.20E-04*
Acrolein	2.70E-03	*3.97E-05*	*9.58E-05*	*1.92E-04*
Benzene	5.80E-03	*8.53E-05*	*2.06E-04*	*4.11E-04*
Ethylbenzene	6.90E-03	*1.01E-04*	*2.45E-04*	*4.89E-04*
Formaldehyde	1.23E-02	*1.81E-04*	*4.36E-04*	*8.72E-04*
Hexane	4.60E-03	*6.76E-05*	*1.63E-04*	*3.26E-04*
Naphthalene	3.00E-04	*4.41E-06*	*1.06E-05*	*2.13E-05*
PAHs (4)	1.00E-04	*1.47E-06*	*3.55E-06*	*7.09E-06*
Toluene	2.65E-02	*3.90E-04*	*9.40E-04*	*1.88E-03*
Xylene	1.97E-02	*2.90E-04*	*6.99E-04*	*1.40E-03*
Total HAPs		*1.21E-03*	*2.91E-03*	*5.82E-03*

Notes:

(1) All factors from Ventura County APCD, "AB2588 Combustion Emission Factors," Natural Gas Fired External Combustion Equipment 10-100 MMBtu/hr. Available at http://www.vcapcd.org/pubs/Engineering/AirToxics/combem.pdf

(2) Based on maximum hourly heat input of *0.015* MMscf/hr

(3) Based on total annual fuel use of *70.9* MMscf/yr

(4) Total PAHs, excluding naphthalene. See speciation below.

(5) Emission factors for individual PAHs obtained from AP-42, Table 1.4-3, then adjusted proportionally so that total of "Adjusted EF" equals Total PAH EF of 1.0 E-04 lb/MMscf per Ventura County factors.

Speciated PAHs (except naphthalene)

	Mean EF (Note 1)	Adjusted EF (Note 5)	Emissions	
			lb/hr	tpy
Benzo(a)anthracene	1.80E-06	1.58E-05	2.32E-07	5.60E-07
Benzo(a)pyrene	1.20E-06	1.05E-05	1.55E-07	3.73E-07
Benzo(b)fluoranthrene	1.80E-06	1.58E-05	2.32E-07	5.60E-07
Benzo(k)fluoranthrene	1.80E-06	1.58E-05	2.32E-07	5.60E-07
Chrysene	1.80E-06	1.58E-05	2.32E-07	5.60E-07
Dibenz(a,h)anthracene	1.20E-06	1.05E-05	1.55E-07	3.73E-07
Indeno(1,2,3-cd)pyrene	1.80E-06	1.58E-05	2.32E-07	5.60E-07
Total	1.14E-05	1.00E-04	1.47E-06	3.55E-06

Table 5.1B-18R
Detailed Emission Calculations for Boiler Commissioning
Hidden Hills Solar Electric Generating System
Revised April 2012

Units	Activity	Days	Daily Operation (hrs/day)	Heat Input Rate (MMBtu/hr)	Pollutant	Emission Factor (lbs/MMBtu)	Hourly Emissions (lbs/hr)	Daily Emissions (lbs/day)	Total Emissions During Test (lbs)	Notes
Auxiliary Boilers	Cold start/tuning	2	4	31.1	NOx	0.09	2.74	11.0	21.9	1 day per boiler. Use cold start emission rates
					CO	0.15	4.55	18.2	36.4	
					VOC	0.043	1.34	5.4	10.7	
					SOx	0.0021	0.07	0.3	0.5	
					PM10	0.01	0.31	1.2	2.5	
Auxiliary Boilers	Warm start/tuning	2	4	31.1	NOx	0.09	2.74	11.0	21.9	1 day per boiler. Assume same as cold start emission rates
					CO	0.15	4.55	18.2	36.4	
					VOC	0.04	1.34	5.4	10.7	
					SOx	0.0021	0.07	0.3	0.5	
					PM10	0.01	0.31	1.2	2.5	
Auxiliary Boilers	Part Load Operation	8	6	93	NOx	0.0110	1.03	6.2	49.3	4 days per boiler. Assume fully controlled levels based on 25% minimum compliant load
					CO	0.018	1.71	10.2	81.9	
					VOC	0.0054	0.50	3.0	24.1	
					SOx	0.0021	0.20	1.2	9.4	
					PM10	0.005	0.47	2.8	22.4	
Auxiliary Boilers	Full Load Operation	4	4	249	NOx	0.0110	2.74	11.0	43.8	2 days per boiler.
					CO	0.0183	4.55	18.2	72.8	
					VOC	0.0054	1.34	5.4	21.4	
					SOx	0.0021	0.52	2.1	8.4	
					PM10	0.01	1.25	5.0	19.9	
Nighttime Pres. Boilers	Cold Start Operation	2	4	1.9	NOx	0.0227	0.04	0.2	0.3	1 day per boiler. Assume cold start emissions are 2x normal emissions
					CO	0.0731	0.14	0.5	1.1	
					VOC	0.0107	0.02	0.1	0.2	
					SOx	0.0021	0.00	0.0	0.0	
					PM10	0.01	0.02	0.1	0.2	
Nighttime Pres. Boilers	Part Load Operation	2 2	6 4	5.6	NOx	0.011	0.06	0.4	1.3	2 days per boiler. Assume fully controlled levels based on 25% minimum compliant load
					CO	0.037	0.21	1.2	4.1	
					VOC	0.005	0.03	0.2	0.6	
					SOx	0.0021	0.01	0.1	0.2	
					PM10	0.005	0.03	0.2	0.6	
Nighttime Pres. Boilers	Full Load Operation	2	6	15	NOx	0.0113	0.17	1.0	2.0	1 day per boiler
					CO	0.0366	0.55	3.3	6.6	
					VOC	0.0053	0.08	0.5	1.0	
					SOx	0.0021	0.03	0.2	0.4	
					PM10	0.005	0.08	0.5	0.9	
Maximum/Total for the Commissioning Period		24	120		NOx		2.74	10.96	140.7	Maximum hourly, maximum daily and total commissioning period emissions
					CO		4.55	18.21	239.4	
					VOC		1.34	5.36	68.7	
					SOx		0.52	2.09	19.5	
					PM10		1.25	4.98	48.9	
							lbs/hr	lbs/day	total lbs	