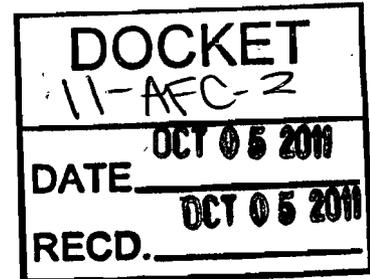




CH2MHILL

CH2M HILL
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October 5, 2011



Mike Monasmith
Compliance Project Manager
Systems Assessment & Facility Siting Division
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Subject: Air Quality Letters to Docket
Hidden Hills SEGS Project (11-AFC-02)

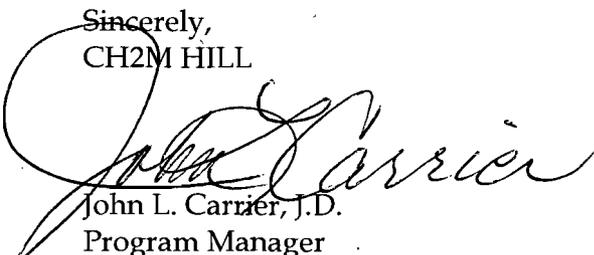
Dear Mr. Monasmith:

Please find attached the following correspondence regarding Air Quality that need to be submitted to Dockets:

- Letter to Duane Ono, GBUAPCD, from Nancy Matthews of Sierra Research, dated October 4, 2011, Regarding: Correction to Air Quality Table 5.1-27.
- Letter to Jan Sudomier, Great Basin Unified Air Pollution Control District, from Nancy Matthews, Sierra Research, dated October 4, 2011, Regarding: Response to District Requests for Additional Information

Thank you for adding these documents to the record.

Sincerely,
CH2M HILL


John L. Carrier, J.D.
Program Manager

Encl.

October 4, 2011



**sierra
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Memo to: Duane Ono, GBUAPCD
Mike Monasmith, CEC CPM

From: Nancy Matthews *Nancy Matthews*

Subject: BrightSource Energy Hidden Hills Solar Electric Generating Station
11-AFC-2, GBUAPCD Application No. 1592
Correction to Air Quality Table 5.1-27

We have identified some transcription errors in the "Maximum Daily Emissions" section of Table 5.1-27. A corrected table is attached, titled Table 5.1-27R. The corrections in Table 5.1-27R do not affect the ambient air quality modeling analysis because the correct maximum daily emission rates for SO₂ and PM₁₀/PM_{2.5} were used in that analysis.

If you have any questions regarding this correction, or any other aspect of the air quality analysis, please do not hesitate to contact me.

Attachment

cc: Clay Jensen, BSE
Susan Strachan, Strachan Consulting
Jeff Harris, Ellison Schneider & Harris
John Carrier, CH2M Hill

TABLE 5.1-27R
Maximum Emissions from New Equipment
 Rev. 10/4/11

Emissions/Equipment	Pollutant				
	NOx	SO ₂	CO	VOC	PM ₁₀ /PM _{2.5}
Maximum Hourly Emissions^a					
Boilers	38.1	7.4	119.7	18.6	17.6
Emergency Engines	41.6	0.04	5.9	1.0	0.4
Diesel Fire Pump Engines	1.9	<0.01	1.2	0.1	0.1
WSACs	—	—	—	—	<0.01
Total, pounds per hour	43.5	7.4	119.7	18.6	17.6
Maximum Daily Emissions^b					
Boilers	242.6	35.6 <u>46.6</u>	738.4 <u>794.0</u>	404.4 <u>117.0</u>	88.5 <u>111.0</u>
Emergency Engines	41.6	0.04	5.9	1.0	0.4
Diesel Fire Pump Engines	1.9	<0.01	1.2	0.1	0.1
WSACs	—	—	—	—	0.1
Total, pounds per day	242.6	35.6 <u>46.6</u>	738.4 <u>794.0</u>	404.4 <u>117.0</u>	88.5 <u>111.0</u>
Maximum Annual Emissions					
Boilers	10.2	1.8	29.8	4.7	4.4
Emergency Engines	2.1	<0.01	0.3	0.05	0.02
Diesel Fire Pump Engines	0.1	<0.01	0.1	0.01	0.01
WSACs	—	—	—	—	0.01
Total, tons per year	12.3	1.8	30.2	4.8	4.4

^a Boilers and engines will not operate during the same hour (see Table 5.1B-12, Appendix B). Maximum hourly NOx emissions occur during engine testing; maximum hourly emissions of other pollutants occur during boiler operations.

^b Engine testing will occur only on days when the auxiliary boilers do not operate (see Table 5.1B-12, Appendix B). Maximum daily NOx emissions occur on a day when the auxiliary boilers undergo cold startup. Maximum daily SO₂ and PM₁₀/PM_{2.5} emissions occur on a normal auxiliary boiler operating day. Maximum daily CO and VOC emissions occur on a nighttime boiler startup day.



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October 4, 2011

Jan Sudomier
Great Basin Unified Air Pollution Control District
157 Short Street
Bishop, CA 93514

Subject: BrightSource Energy Hidden Hill Solar Electric Generation System
Application for Authority to Construct and Determination of Compliance
Application No. 1592
Response to District Requests for Additional Information

Dear Jan:

In your email message dated September 6, 2011, you requested additional information to clarify and support certain aspects of the BrightSource Energy Hidden Hills Solar Electric Generation System (HHSEGS) application for an authority to construct and determination of compliance. Some of the information was provided in our email message dated September 8. The purpose of this letter is to provide the remaining information requested.

Each request is repeated below, followed by our response.

1. **Request:** Lead (Pb) does not appear to have been considered with the other toxics. In addition to adding Pb to the toxics, could you also run health risk analysis that DTSC is developing <http://www.dtsc.ca.gov/AssessingRisk/leadspread.cfm>?

Response: There are no data to suggest that there will be any lead emissions from the facility during operation. The references we used to calculate potential toxic air contaminant emissions for the natural gas-fired boilers did not include any emission factors for lead. The AP-42 emission factors for natural gas-fired boilers (discussed further in #2 below) and large diesel engines also do not include lead. It is also unlikely that there would be lead emissions generated during construction. As stated in Section 5.11.4.4 (Soils) of the AFC, "The Phase I ESA (Appendix 5.14A; (Ninyo and Moore, 2011)) concluded that there were no recognized environmental conditions (RECs) associated [with] the project site."

It appears that DTSC's LeadSpread model is intended for use in evaluating residential land use scenarios, which would not be applicable to this project. However, DTSC also indicates that the current version of the DTSC Lead Risk Assessment Spreadsheet (LeadSpread 8) includes a modified version of USEPA's Adult Lead Model, which incorporates DTSC recommendations for evaluating industrial worker exposures to lead in soil. If further testing

reveals that there is any lead in the soils at the project site, a health risk analysis will be conducted to determine whether there is any potential for unacceptable exposure risks to construction or site workers.

2. **Request:** Your toxic lists seem quite abbreviated in the summary, do you include all the AP-42 listed toxics in the appendices?

Response: The list of toxic air contaminants was taken from Ventura County APCD's list and includes all of the TACs in CARB's CATEF data base as well as most of the factors for organic compounds in AP-42 Table 1.4-3. (Note that PAHs such as naphthalenes and anthracenes are included under polycyclic aromatics in Table 5.1-30.) Emissions of metals from Table 1.4-4 are not included because metals are not included by either Ventura County or CARB in their lists of emissions from natural gas-fired boilers. Further, since there are no emission factors for metallic TACs for natural gas-fired gas turbines (AP-42 Section 3.1), we believe that the Table 1.4-4 factors for boilers are artifacts of the test procedures upon which the factors are based and are not representative of emissions from new natural gas-fired boilers in California.

3. **Request:** Where is this project in the CEQA process?

Response: As discussed in our meeting in late May, the California Energy Commission process is the CEQA functional equivalent process for this project, so the CEC will act as the CEQA lead agency. The Application for Certification was filed with the CEC on August 5. It is anticipated that the California Energy Commission will deem the application Data Adequate at the October 5, 2011 meeting. The Data Adequacy determination will initiate the CEC's licensing process and its formal substantive environmental review of the project.

4. **Request:** I've been out to the area, there appeared to be many structures, demolition of structures require a thorough inspection for asbestos by a certified asbestos consultant (list available at http://www.dir.ca.gov/Databases/doshcaccsst/caccsst_Query_1.HTML), and if asbestos is found, and it is of the type and quantity that must be removed prior to demolition, an approved asbestos contractor must be used (list available at <http://www.dir.ca.gov/Databases/doshacru/acrusearch.html>).

Response: According to survey crews who have visited the project site, the site is mostly vacant, disturbed land that has not been developed in any way. Portions of the site have been graded and roads put in for anticipated development as residential property, but no residential or other development has taken place within the project site boundaries. The only structures on the site are fences, water wells, a meteorological monitoring station installed by BSE in October 2010, and abandoned underground tanks. During site preparation, the wells will be removed from service and the tanks will be hauled away.

There are trailers and houses adjacent to, but not within, the project site. These structures will remain untouched and will not be affected by the project. Therefore, we do not believe there will be any demolition that will involve structures containing asbestos. However, if any

structures must be demolished, they will be inspected by a certified asbestos consultant. If asbestos is found, the appropriate procedures will be followed.

5. Additional missing info from AB 884 follows (<http://www.gbuapcd.org/Permit%20Applications/AB-884%20List%20and%20Criteria.pdf>).
- a. **Request:** CEMs is mentioned in the supporting papers, but not on the application.
Response: As stated in Section 5.1.4.4 of the application support document, the auxiliary boilers will be equipped with continuous emissions monitoring systems to measure and record emissions of NOx and oxygen, as required under 40 CFR Parts 60 and 75. Fuel use will also be continuously monitored and recorded for all of the boilers, and operating hours and fuel use will be monitored and recorded for each of the emergency diesel engines and fire pump engines.
- b. **Request:** A definitive list of hours of operation, and schedule for year, and total MW produced.
Response: Typical daily and annual hours of operation and schedule for the year for each of the boilers are summarized in Table 5.1B-8, Appendix 5.1B. As stated in the footnotes to the table and in other places in the application, the hours shown in this table are annual average equivalent full load hours; the boilers may operate more hours on some days and/or at lower loads, including hot standby. Emissions will be limited through fuel consumption limitations: monitored fuel use and emission factors will be used to calculate and track emissions to ensure compliance with the emissions limits proposed in the application for pollutants that are not monitored by CEMS. Various potential daily operations under different operating scenarios are shown in Table 5.1B-12 of Appendix 5.1B. Because daily and annual operation of the facility will vary with electrical demand and weather (since some boiler operation will occur during cloudy periods), the application describes typical conditions and proposes emissions and operating limits that will provide operational flexibility while ensuring that the facility will be in compliance with applicable federal, state, and district laws and regulations.
- Maximum gross output from both solar plants is 1,512,000 MWh per year (see Air Quality Table 5.1B-13, Appendix 5.1B). The following text and table, showing net output, was provided to the CEC as a data adequacy response in the area of efficiency:¹

The following table addresses solar only mode and natural gas mode (with partial solar or without). Note that during the night preservation and during start-up the boilers are in operation but there is no net electrical energy being produced to the grid. This table also takes into account maintenance outages and plant availability.

¹ Hidden Hills SEGS (11-AFC-2) Applicant's Response to Data Adequacy Review - Dated: September 2009. Available at http://www.energy.ca.gov/sitingcases/hiddenhills/documents/applicant/2011-09_Hidden_Hills_Applicant_Response_to_Data_Adequacy_Review.pdf.

TABLE EFF-1

Electrical Energy Produced for Various Modes of Operation

	One Plant	Two Plants
	Net (MWh/year)	Net (MWh/year)
Solar Produced Electricity	677,690	1,355,380
Natural Gas Contribution	53,156	106,312

- c. **Request:** Control efficiency of the FGR & 9 ppm burners somewhere in the supporting documents? And the “control” of not letting the NOx exceed 230 lb/day – how’s that going to work?

Response: The 9 ppm NOx limit for the boilers is an equipment specification, and the NOx emissions from the boilers ultimately selected for the project will be guaranteed by the vendors not to exceed 9 ppm through a combination of flue gas recirculation and low-NOx burner technology. The 9 ppm NOx limit is also expected to be included in District permit conditions, and compliance with this NOx emissions limit will be verified during initial compliance testing and annual source testing, as well as through continuous NOx emissions monitoring for the auxiliary boilers.

Maximum daily NOx emissions from the project are expected to be limited by permit condition to 242.6 lb/day (see Table 5.1-27). The majority of these emissions (between 195 and 230 lb/day) will come from the auxiliary boilers (see Table 5.1B-12) and NOx emissions from the auxiliary boilers will be continuously monitored. In addition, total heat input to all of the boilers will be limited to 22,290 MMBtu/day (see Table 5.1-20). Combined with the 9 ppm NOx limit for the smaller boilers, these requirements and limitations will ensure that the daily NOx limit is not exceeded.

- d. **Request:** Manufacturer name, model, etc for all fuel burning equipment – (I can work with 500 million BTU/hr tangentially fired NG boiler for only so long).

Response: The manufacturer names and model numbers for the boilers and engines are not likely to be known until after final engineering is completed. We believe that the District can rely on the information in Tables 5.1-15 and 5.1-17 and issue the permits for the equipment as described in those tables (for example, Rentech or equivalent boiler, equipped with low-NOx burners rated at maximum heat input of 500 MMBtu/hr and flue gas recirculation, fueled exclusively on utility grade natural gas, producing 350,000 lb/hr of steam). Once the equipment manufacturer and model numbers are known, the applicant will submit this information to the District and request an administrative change to the Authorities to Construct.

- e. **Request:** Is the wet surface air cooler only for the lube oil? Is the lube oil only cooled, it’s never heated?

Response: The wet surface air cooler at each solar field will be a part of the auxiliary cooling system, which will cool the generator, steam turbine generator lubrication oil, boiler feed pump lubricating oil, solar receiver steam generator circulating water pumps, and other equipment requiring cooling. Yes, the lube oil is only cooled and will not require heating.

f. **Request:** Is electricity generated only with steam? Is there any secondary fluid involved?

Response: Electricity will be generated only with steam—no secondary heat transfer or other fluid will be involved.

6. **Request:** The top of page 5.1E3 “The power plant is assumed to operate at hourly, daily and annual emission conditions that produce the highest ground-level concentrations. In fact, the power plant is expected to operate at a variety of conditions that will produce lower emissions and impacts” – was not clear as to what was meant. Is there a list of worst-case conditions?

Is this what you meant – using the different hours of operations for different pollutants for dispersion modeling inputs? See below boiler pollutant example.

from table 5.1-27

NOx	38.1 lb/hr		
	242.6 lb/day	6.4 hrs/day	
	10.2 tpy	535.4 hrs/yr	
CO	119.7 lb/hr		
	738.4 lb/day	6.2 hrs/day	
	29.8 tpy	497.9 hrs/yr	
PM	17.6 lb/hr		
	88.5 lb/day	5.0 hrs/day	
	4.4 tpy	500.0 hrs/yr	

Response: The cited statement is part of a list of reasons the cancer risk predicted in the screening health risk assessment (SHRA) is believed to conservatively overestimate potential cancer risks from the project and is not related to the dispersion modeling analysis for criteria pollutants. The statement means that the annual emission rates used for the cancer health risk assessment represent maximum annual permitted operation, but the plant is unlikely to operate under conditions that would produce at its maximum permitted annual emissions—especially every year for 70 years, as is assumed in cancer HRAs.

You are correct that different operating scenarios were used for different criteria pollutant modeling inputs. However, the NOx annual emissions for the boilers shown in Table 5.1-27 are not calculated by multiplying the lb/hr boiler emission rates by the number of hours shown in your summary above. Rather, the annual NOx emissions reflect the expected annual operating scenario for the boilers, including assumptions regarding varying hours of cold startups for the different boiler types (see “Maximum Annual Emissions” section of Table 5.1B-12, at the top of page 5.1B-16).