CH2M HILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833
Tel 916.286.0224
Fax 916.614.3424

CH2MHILL

DOCKET
11-AFC-2
DATE FEB 20 2012
RECD. FEB 21 2012

February 20, 2012

427930.DI.DR

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

Subject: Data Response, Set 2B-2
Hidden Hills Solar Electric Generating System (11-AFC-2)

Dear Mr. Monasmith:

On behalf of Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC, please find attached an electronic copy of Data Response, Set 2B-2 in response to Staff's Data Request Set 2B filed on January 17, 2012.

Hard copies will be sent out today. Please call me if you have any questions.

Sincerely,

CH2M HILL

John L. Carrier, J.D.
Program Manager

Encl.

c: POS List
Project file

Data Response 2B-2

Hidden Hills

Solar Electric Generating System

(11-AFC-2)

Application for Certification

Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC

February 2012

With Technical Assistance from

CH2MHILL®

IS061411043744SAC

Hidden Hills Solar Electric Generating System

(11-AFC-2)

Data Response, Set 2B-2
(Response to Data Request 146)

Submitted to the

California Energy Commission

Submitted by

Hidden Hills Solar I, LLC; and
Hidden Hills Solar II, LLC

February 20, 2012

With Assistance from
CH2MHILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

Contents

Section **Page**

Introduction 1

Air Quality (146) 2

Introduction

Attached is Hidden Hills Solar I, LLC, and Hidden Hills Solar II, LLC (collectively, "Applicant") response to the California Energy Commission (CEC) Staff's data request number 146 for the Hidden Hills Solar Electric Generating System (HHSEGS) Project (11-AFC-2). The CEC Staff served this data request on January 17, 2012. New tables are numbered in reference to the data request number. For example, the first table used in response to Data Request 146 is numbered Table DR146-1.

Air Quality (146)

BACKGROUND: OPERATIONS EMISSIONS CALCULATIONS DATA REQUEST

Applicant does not include the emissions from mirror washing activities in the total project emissions in Table 5.1-26. Applicant does not include the mirror washing emissions in the operations impact analysis either. Applicant does quantify the emissions from mirror washing activities in Table 5.1-27 and these emissions are not negligible. For example, the annual NOx emission from mirror washing activities is expected to be 13.7 tons/yr, while it is 12.3 tons/yr from all stationary sources.

DATA REQUEST

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

Response: Applicant believes it is not appropriate to include emissions from mirror washing activities in the total project emissions because, as discussed in Applicant's Data Response 136, emissions from mirror washing activities are not part of emissions from the stationary source for any applicable LORS, and Applicant has already quantified emissions from mirror washing activities for purposes of CEQA (in Table 5.1D-2 of the AFC). However, Applicant is providing this analysis, in the form requested by Staff, at the request of Staff.

Criteria Pollutant Emissions

Table DR146-1 shows maximum hourly, daily, and annual emissions from all facility operations, including both stationary and mobile sources. Emissions from the boilers, engines, and wet surface air coolers (WSACs) were taken from Table 5.1-27R (revised 10/4/11)[1]. Emissions from the mirror washing machines (MWMs) were taken from Table 5.1B-11 (Appendix 5.1B to the AFC).

Table DR146-2 shows the hourly, daily, and annual emission rates used for modeling the MWMs. The MWMs were modeled as point sources, with a release (stack) height of 8 feet (based on the expected height of the MWMs that will transport the mirror washing apparatus). Emissions were divided among approximately 180 point sources distributed over the project area.

Emissions and stack parameters for the stationary sources were taken from Table 5.1D-2 (Appendix 5.1D to the AFC). Because the emergency engines will not be tested while the MWMs are in operation, only the "boiler operations" scenarios were modeled for the 1-, 3-, 8-, and 24-hour averaging periods.[2] The results of the modeling analysis are summarized in Table DR146-3.

[1] See "Air Quality Letters to Docket", filed on October 5, 2011

[2] See Table 5.1-36 of the AFC, which shows maximum modeled concentrations from all operating scenarios, including boiler startup and hot standby operation. As indicated in footnote a to that table, the maximum 1-hour NO_2 impact occurs during engine testing; however, since the MWMs will not operate during engine testing, that scenario is not modeled here. The maximum 1-hour NO_2 impact during normal boiler operations is 80 $\mu g/m^3$, which is higher than the maximum one-hour impacts from the boilers during startup and hot standby operations. Maximum impacts for all pollutants except NOx occur during normal boiler operation.

Screening HRA

Diesel particulate matter (DPM) emissions from the MWMs were also included in the screening health risk assessment that was performed for the project. The MWM DPM emission rate of 0.5 ton/yr was also taken from Table 5.1B-11. Emission rates and source characterizations for the stationary sources are described in detail in Appendix 5.1E to the AFC. Including MWMs in the cancer risk assessment increases the modeled residential cancer risk by 1 in one million, from 0.39 to 1.4 in one million. Residential cancer risk remains well below the 10 in one million level considered to be significant.

TABLE DR146-1
Maximum Emissions from All Facility Operations Including Mobile Sources
Hidden Hills Solar Electric Generating System

Emissions/Equipment[a]	Pollutant					
	NOx	**SO_2**	**CO**	**VOC**	**PM10**	**PM2.5**
Maximum Hourly Emissions[b]						
Boilers	38.1	7.4	119.7	18.6	17.6	17.6
Emergency Engines	41.6	0.04	5.9	1	0.4	0.4
Diesel Fire Pump Engines	1.9	<0.01	1.2	0.1	0.1	0.1
WSACs	-	-	-	-	<0.01	<0.01
MWMs	7.1	0.13	2.1	3.4	1.9	0.4
Total, pounds per hour	**45.2**	**7.5**	**121.8**	**22.0**	**19.5**	**18.0**
Maximum Daily Emissions[c]						
Boilers	242.6	46.6	794	117	111	111
Emergency Engines	41.6	0.04	5.9	1	0.4	0.4
Diesel Fire Pump Engines	1.9	<0.01	1.2	0.1	0.1	0.1
WSACs	-	-	-	-	0.1	0.1
MWMs	74.9	1.3	22.0	35.6	20.3	4.3
Total, pounds per day	**317.5**	**47.9**	**816.0**	**152.6**	**131.3**	**115.3**
Maximum Annual Emissions						
Boilers	10.2	1.8	29.8	4.7	4.4	4.4
Emergency Engines	2.1	<0.01	0.3	0.05	0.02	0.02
Diesel Fire Pump Engines	0.1	<0.01	0.1	0.01	0.01	0.01
WSACs	-	-	-	-	0.01	0.01
MWMs	13.7	0.2	4.0	6.5	3.7	0.8
Total, tons per year	**26.1**	**2.0**	**34.2**	**11.3**	**8.1**	**5.2**

[a]Emissions from boilers, engines and WSACs from Table 5.1-27R (Rev. 10/4/11)

[b]Boilers and engines will not operate during the same hour (see Table 5.1B-12, Appendix B). Engines will not be tested while MWMs are in operation.

[c]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/PM2.5 emissions occur on a normal auxiliary boiler operating day. Maximum daily CO and VOC emissions occur on a nighttime boiler startup day (see Section 5.1 of the AFC).

TABLE DR146-2
Emission Rates for Modeling Mirror Washing Activities
Hidden Hills Solar Electric Generating System

	Emission Rates, g/s				
	NOx	**SO_2**	**CO**	**PM10**	**PM2.5**
Averaging Period: One hour					
MWMs-- combustion	0.8987	1.604E-02	0.265	n/a	n/a
Averaging Period: Three hours					
MWMs-- combustion	n/a	1.604E-02	n/a	n/a	n/a
Averaging Period: Eight hours					
MWMs-- combustion	n/a	n/a	0.265	n/a	n/a
Averaging Period: 24 hours					
MWMs-- combustion	n/a	7.015E-03	n/a	1.303E-02	1.303E-02
MWMs-- fugitive dust	n/a	n/a	n/a	9.364E-02	9.364E-03
Averaging Period: Annual					
MWMs-- combustion	0.3932	7.015E-03	n/a	1.303E-02	1.303E-02
MWMs-- fugitive dust	n/a	n/a	n/a	9.364E-02	9.364E-03

TABLE DR146-3
Total Project Impacts Including Mirror Washing Activities
Hidden Hills Solar Electric Generating System

Pollutant	**Averaging Time**	**Project Impact ($\mu g/m^3$)**	**Background Concentration ($\mu g/m^3$)**	**Total Concentration (Project Impact plus Background) ($\mu g/m^3$)**	**NAAQS ($\mu g/m^3$)**	**CAAQS ($\mu g/m^3$)**
NO_2	1-hr (max)	80.4	inc*	121.1	—	339
	1-hr (98th ptl)	48.7	inc*	90.2	188	—
	Annual	0.3	7.5		100	57
SO_2	1-hr	17.3	93.6	111	196	655
	3-hr	8.7	23.4	32	1300	—
	24-hr	0.5	13.1	14	—	105
	Annual	<0.1	2.7	3	80	—
CO	1-hr	262	1,750	2,012	40,000	23,000
	8-hr	59	1,333	1,392	10,000	10,000
PM_{10}	24-hr	2.5	96	98	150	50
	Annual	0.4	14	14	—	20
$PM_{2.5}$	24-hr	1.2	11.4	13	35	—
	Annual	<0.1	4.9	5	15.0	12

*Total concentrations shown for 1-hour NO_2 are modeled project impacts combined with concurrent hourly NO_2 monitoring data (Tier 4 analysis in Section 3.6 of the modeling protocol). All other totals shown are maximum modeled project impacts combined with maximum monitored background data from Table 5.1-34 of the AFC.

Table DR146-3 input and output files are provided on CD-ROM, five copies of which are being provided to the CEC.