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

DOCKET
11-AFC-2
DATE APR 02 2012
RECD. APR 02 2012

April 2, 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: Supplemental Data Response, Set 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 electronic copies of Supplemental Data Response, Set 2, which primarily addresses the project's Boiler Optimization that was discussed during Status Conference 2, on February 28, 2012.

In addition, we have attached the materials that are being sent under separate cover to the Great Basin Unified Air Pollution Control District.

We plan to file this information electronically and follow-up with hard copies. Please call me if you have any questions.

Sincerely,

CH2M HILL

John L Carrier

John L. Carrier, J.D.
Program Manager

Encl.

c: POS List
Project file

Supplemental Data Response Set 2
(Boiler Optimization)

Hidden Hills
Solar Electric Generating System
(11-AFC-2)

Application for Certification
Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC

April 2012

With Technical Assistance from

CH2MHILL®

IS061411043744SAC

Hidden Hills Solar Electric Generating System (HHSEGS)

(11-AFC-2)

Supplemental Data Response, Set 2
(Project Description and Visual Resources)

Submitted to the

California Energy Commission

Submitted by

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

April 2, 2012

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

Contents

Section **Page**

Introduction 1

Project Description (PD-1) 2

  Reduction in the Number of Boilers and Changed Power Block Arrangement 2

  Relocation of Switchyard and Gas Metering Station 3

  Installation of a Temporary Construction Well 4

  Summary 4

Visual Resources (VR-1 through VR-5) 9

Attachment A – Figures

Attachment B – Tables

Introduction

Attached are supplemental responses (Set 2) by Hidden Hills Solar I, LLC, and Hidden Hills Solar II, LLC (collectively, “Applicant”) to the California Energy Commission (CEC) Staff’s data requests for the Hidden Hills Solar Electric Generating System (HHSEGS) project (11-AFC-2). These materials are in response to questions raised at the February 22, 2012 workshop, information requested by staff, and discussions at the February 28th Status Conference.

The supplemental responses are grouped by individual discipline or topic area. AFC figures or tables that have been revised have “R1” following the original number, indicating revision 1. Additional tables, figures, or documents submitted in response to this supplemental data response (supporting data, stand-alone documents such as plans, folding graphics, etc.) are found at the end of this Data Response Set.

Project Description

BACKGROUND

On February 27, 2012, the Applicant submitted a letter to the Siting Committee for the HHSEGS project, made up of Commissioners Karen Douglas and Carla Peterman, informing them of a proposed design change for the HHSEGS that would reduce project environmental impacts, enhance plant efficiencies, and make the design more consistent with that of the Ivanpah Solar Electric Generating System (07-AFC-05C). These "Boiler Optimization" changes were discussed at the Status Conference.

DATA REQUEST

PD-1 During a status conference held by the California Energy Commission on February 28, 2012, the Siting Committee for the HHSEGS project requested that they be kept informed about the Boiler Optimization.

Response: Following a coordinated design review intended to identify opportunities for reduced environmental impacts and enhanced plant efficiencies, Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC (the Applicant), is proposing to modify the proposed HHSEGS project to optimize costs and use of natural resources. Primarily, the Applicant is proposing to remove the large auxiliary boilers from the design for HHSEGS as part of a "Boiler Optimization" effort. Boiler Optimization will result in air emission reductions for HHSEGS compared to those identified in the Application for Certification (AFC).

Reduction in the Number of Boilers and Changed Power Block Arrangement

Under the optimized project design, the number of boilers at each power block will be reduced from five to two—the large auxiliary boilers have been eliminated and the medium-sized and smallest boilers will remain. The operation of the remaining boilers has also been re-optimized to support the operation of the solar receiver steam generator (SRSG) in a more efficient and effective manner.

As in the original design, the solar field and power generation equipment will start each morning after sunrise and will shut down when insolation drops below the level required to keep the turbine online. Each solar plant will include a 249 MMBtu/hr natural gas-fired auxiliary boiler (this is the medium sized boiler, previously called the "startup boiler") that will be used to pre-warm the SRSG to minimize the amount of time required for startup each morning, to assist during shutdown cooling operation, and to augment the solar operation during the evening shoulder period as solar energy diminishes. As in the original design, a small natural gas-fired nighttime preservation boiler will be retained and used to maintain system temperatures overnight.

Given the removal of the large boilers, the annual natural gas use in the remaining two boilers under the optimized design will be reduced by about half compared with total gas use in the original design. Boiler Optimization will also reduce emission of greenhouse gas and criteria pollutants for HHSEGS under all scenarios. As a result of the optimization, the general arrangement of the power block has been revised. Figure 2.2-1R1 shows the updated plot plan. In addition, Figures 2.2-2aR2 and 2.2-2bR2 provide revised elevation drawings. All figures are provided in Attachment A, Figures.

The change in the power block also results in a change in equipment redundancy as it applies to project availability. A summary of equipment redundancy is shown in Table 2.3-1R1 (all tables are in Attachment B, Tables).

The major components of each solar plant's power block, as revised, are described in Table 2.3-2R1. The power block is served by the balance-of-plant systems described in AFC Sections 2.2.3 through 2.2.11.

Minor design changes have been made to the following systems.

Boiler Feedwater System

The boiler feedwater system transfers feedwater from the deaerator to the SRSG. The system will consist of one turbine-driven (booster & main) pump, one motor-driven backup (booster & main) feedwater pump, and one motor-driven startup pump. The turbine-driven pump is sized for 100 percent capacity for supplying the SRSG. The startup pump will be sized for 25 percent capacity and include a variable frequency drive (VFD). The backup pump is sized for 50 percent turbine load and includes a VFD. The pumps will be multistage, horizontal, and will include regulating control valves, minimum flow recirculation control, and other associated piping and valves. See Table 2.3-1R1 for feedwater pump spares. Separate boiler feedwater pumps will be provided with the night preservation and auxiliary boilers.

Condensate System

The condensate system will provide a flow path from the condensate collection tank to the deaerator. The condensate system will include two 50-percent-capacity multistage, vertical, motor-driven condensate pumps with VFDs. The system also includes deep-bed condensate polishers with offsite regeneration.

Demineralized Water System

The demineralized water system will consist of ion exchanges. Resin media from the vessels will be regenerated off-site by a third-party water treatment supplier. Spare resin for the two plants will be stored in the warehouse located in the common area. Demineralized water will be stored in the demineralized water tank.

Power Cycle Makeup and Storage

The power cycle makeup and storage subsystem provides demineralized water storage and pumping capabilities to supply high-purity water for system cycle makeup and chemical cleaning operations. Major components of the system are the demineralized water storage tank; demineralized water treatment system, and two 100-percent-capacity, horizontal, centrifugal, cycle makeup water pumps.

Relocation of Switchyard and Gas Metering Station

Based on discussions with the Bureau of Land Management (BLM) in its review of the Valley Electric Association's (VEA) right-of-way proceeding, Applicant has agreed to realign the natural gas pipeline and transmission line to avoid the mesquite thickets that would otherwise be impacted by construction of the gas pipeline. Since the gas pipeline and transmission line share a right-of-way, both linears are affected by any routing changes.

However, the BLM-proposed realignment resulted in the need to modify the switchyard and gas metering station locations to better align with the new linear corridor route. Moving the switchyard and gas metering station north within the Common Area would have resulted in potential impacts to cultural sites the Applicant has committed to avoid. Thus, in order to implement the BLM alignment to avoid the mesquite thicket and avoid the cultural sites, the switchyard and metering station are now proposed to be located immediately across the state border on BLM land in Nye County, Nevada.

These recommended revisions will also result in the generation transmission lines on the HHSEGS site being placed underground, which will reduce the potential for visual impacts and reduce future maintenance needs. Since the switchyard and metering station will be moved immediately across the border, any potential impacts of those facilities will be analyzed along with the other project components located in Nevada—in compliance with the National Environmental Policy Act (NEPA).

Installation of a Temporary Construction Well

To reduce the number of truck trips during construction, the Applicant intends to drill a temporary well to be used during construction only, primarily for the onsite concrete batch plant used to serve project construction needs. This temporary well will eliminate the need to bring water to the construction area via tanker truck. Construction activities were previously determined to require approximately 288 acre-feet of water per year over the 29-month construction period. The installation of a temporary well will not increase water usage above the 288 acre-feet per year (afy) needed for construction. The temporary well will be used in conjunction with the other permanent wells described in the AFC to provide water during construction.

Summary

While these optimizations may affect to some degree Air Quality, Hazardous Materials, Public Health, Visual Resources, Waste Management, and Water Resources, the effects remain less than significant. The Boiler Optimization enhancements will have little to no effect on the majority of disciplines, as summarized below.

Air Quality

Reducing the number of boilers will have a positive effect on the environment compared to the impacts described in the AFC. A version of the Air Quality Section of the AFC, with changes tracked, has been prepared and a copy will be provided to the Air District, CEC, and the proof-of-service list, along with a copy of the other materials filed with the District. The reduced air quality impacts reflect the Boiler Optimization and related changes in project design, as follows:

- Eliminating the large 500 MMBtu/hr boilers
- Optimizing operations of the 249 MMBtu/hr auxiliary boilers (previously called the “startup boilers”)
- Slightly increasing the size of the smallest nighttime preservation boilers (from 12 to 15 MMBtu/hr)
- Slightly increasing the size of the wet surface air coolers

- Reducing the sizes of the fire pump engines
- Reducing the number of mirror washing machines, and using certified on-road engines instead of certified off-road engines in the larger vehicles
- Reconfiguring the power blocks and the Common Area

The overall conclusions presented in the AFC have not changed: using the criteria employed by California's air districts and by the U.S. Environmental Protection Agency, the project's emissions will not cause or contribute significantly to a violation of any ambient air quality standards, do not trigger requirements for offsets or Best Available Control Technology, and will have less-than-significant impacts for all pollutants under the California Environmental Quality Act. The proposed Boiler Optimization will not subject the project to any new laws, ordinances, regulations or standards (LORS).

Boiler Optimization will reduce maximum annual natural gas fuel use at the facility, as shown in Table PD1-1, Maximum Facility Natural Gas Fuel Use, in Attachment B.

Table PD1-2, Reductions in Annual Emissions, shows that annual criteria pollutants and the annual GHG emissions will also be reduced under the Boiler Optimization.

Emissions of most pollutants from mirror cleaning activities will also be reduced as a result of the project optimization, as shown in Table PD1-3, Annual Emissions from Mirror Cleaning Activities.

Under the optimized project, maximum modeled criteria pollutant impacts will be lower than the maximum modeled impacts shown in the AFC, as shown in Table PD1-4, Maximum Modeled Impacts.

Biological Resources

The Boiler Optimization does not change the Biological Resources section of the AFC, and no LORS will change as a result of the proposed enhancements. As a result, any potential Biological Resource impacts associated with this optimization will remain less than significant.

Cultural Resources

The Boiler Optimization does not change the Cultural Resources section of the AFC, and no LORS will change as a result of the proposed enhancements. Further, with the relocation of the switchyard to BLM-managed lands in Nevada, the project can avoid certain Cultural Resources sites identified as potentially significance. As a result, any potential Cultural Resource impacts associated with this optimization will be less than significant.

Geologic Hazards and Resources

The Boiler Optimization does not change the Geologic Hazards and Resources section of the AFC, and no LORS will change as a result of the proposed enhancements. As a result, any potential Geologic Hazards and Resources impacts associated with this optimization will be less than significant.

Hazardous Materials Handling

The Boiler Optimization may result in minor changes to the Hazardous Materials Handling section of the AFC.

As shown in Table PD1-1, annual natural gas use in the boilers under the optimized design will be reduced by about half compared with the original design. Revised hazardous materials tables (Table 5.5-2R1 and 5.5-3R1) are provided in Attachment B. Changed quantities and revised storage locations are identified in the tables.

Instead of the steam condensate treatment (Steamate NA 1321) identified in Table 5.5-2 of the AFC, aqueous ammonia (1,200 gallons of 19 percent solution) will be used for boiler water chemistry control. The quantity stored will not exceed the threshold of 20,000 pounds of a 20 percent solution under the Federal Risk Management Plan (RMP) program. Due to a combination of the ammonia's concentration, the storage volume onsite, and the location of storage at the power blocks, which are over 0.5 mile from the nearest residence, the amount of ammonia will not have a significant impact, and poses a low risk to the public.

Sulfuric acid (93%) will also be used for pH control, and has been added to the hazardous materials inventory. Finally, the hazardous materials list has also been updated to include lead-acid batteries which power each heliostat motor as that was inadvertently omitted from the AFC

Regardless of these changes, any potential Hazardous Materials impacts associated with this optimization will be less than significant.

Land Use

The Boiler Optimization does not change the Land Use section of the AFC, and no LORS will change as a result of the proposed enhancements. As a result, any potential Land Use impacts associated with this optimization will be less than significant.

Noise

The Boiler Optimization does not change the Noise section of the AFC, and no LORS will change as a result of the proposed enhancements. As a result, any potential Noise impacts associated with this optimization will be less than significant.

Paleontological Resources

The Boiler Optimization does not change the Paleontological Resources section of the AFC, and no LORS will change as a result of the proposed enhancements. As a result, any potential Paleontological Resources impacts associated with this optimization will be less than significant.

Public Health

Boiler optimization will affect the public health impacts of the proposed project, though the impacts will continue to be less than significant. The Public Health section of the AFC has been revised to reflect the project changes, and a copy of this redline/~~strikeout~~ version will be included with the materials submitted to the Air District, CEC and proof-of-service list. No LORS will change as a result of the proposed enhancements. Potential public health impacts associated with the project will remain below significant impact thresholds, as shown in Table PD1-5, Potential Health Risks from the Operation of the Project, Including Mirror Washing Machines, in Attachment B.

Socioeconomics

The Boiler Optimization may result in minor changes to the workforce projections, but such changes would not be significant from those addressed in the AFC. Therefore, impacts and benefits do not change the Socioeconomics section of the AFC, and no LORS will change as a result of the proposed enhancements. As a result, any potential Socioeconomics impacts associated with this optimization will be less than significant.

Soils

The Boiler Optimization does not change the Soils section of the AFC, and no LORS will change as a result of the proposed enhancements. As a result, any potential Soils impacts associated with this optimization will be less than significant.

Traffic and Transportation

Impacts on traffic and transportation are not anticipated because the site location and the main access routes will not change. Internal roads may be re-routed somewhat to accommodate the switchyard relocation, but there are no anticipated traffic impacts resulting from those changes. Volumes of traffic generated by the project are not expected to change significantly because the construction schedule will not vary significantly from what was originally proposed. If anything, the number of equipment deliveries will decrease slightly. Operation of the facility will not require any changes to the number of workers or operating hours so the Boiler Optimization will not impact traffic patterns in the vicinity of the site. No LORS will change as a result of the proposed enhancements. As a result, any potential Traffic and Transportation impacts associated with this optimization will be less than significant.

Visual Resources

The Boiler Optimization will result in relatively minor changes to the project that are reflected in the revised plot plan (Figure 2.2-1R1) and the new elevation drawings (Figures 2.2-2aR2 through 2.2-2bR2). Table 5.13-4R1 (in Attachment B) replaces the version of this table that was included in the AFC Visual Resources chapter. This revised Table 5.13-4 includes a more comprehensive list of equipment than the original version of the table, and the dimensions have been revised where needed to reflect equipment changes related to the optimization enhancements.

Figures 5.13-2R1 through 5.13-7R1 (KOP 1 through 6) and DR32-2R1 (KOP 7) are versions of the simulations from each of the 7 Key Observation Points (KOPs) that have been revised to reflect how the project would appear with implementation of the Boiler Optimization enhancements. These changes are relatively minor and difficult to detect. The most notable of these changes (which are still not readily detectable) are the reduction in the number of boiler stacks from 5 to 2 for each of the two power blocks, and the elimination of the onsite transmission structures that were previously needed to transport the power from the power blocks to the switchyard. In addition the design of the SRSG has been modified. The simulations seen in Figures 5.13-2R1 through 5.13-7R1 and DR32-2R1 have been revised to reflect refinements to the design of the SRSG. The solar boiler component is about 160 feet in height (of which the actual boiler is about 67 feet tall) and sits on top of a 590-foot-high concrete solar receiver tower (for a combined height of 750 feet). It has a completely cylindrical design that gives it an appearance that is sleek, similar to the design shown in the AFC simulations.

Comparison of the revised simulations that reflect the modifications to the design with the simulations prepared for the original design (included in the AFC simulations) indicate that the visual changes are very minor, and will not cause a change to the levels of impacts found for the design evaluated in the AFC visual analysis. No LORS will change as a result of the proposed enhancements. As a result, any potential Visual Resource impacts associated with this optimization will be less than significant.

Waste Management

Waste associated with construction of the plant will be slightly reduced by the elimination of the three large boilers. Packaging materials associated with delivery of the additional boilers will be eliminated (for example, plastic wrap, crating materials). In addition, the quantity of construction materials used (and thus construction debris produced) during installation of the boilers will decrease. The materials reduced will include solvents, paints, adhesives, spent welding materials, and hydrotest water for testing equipment and piping. Less concrete will be used for pad construction. Waste produced during operation will not change, and no LORS will change as a result of the proposed enhancements. As a result, any potential Waste Management impacts associated with this optimization will be less than significant.

Water Resources

The installation of a temporary well in the 180-acre temporary construction and laydown area will not increase water usage above the 288 acre-feet per year (afy) need for construction. Although the number of boilers has been reduced, the Applicant has not changed the 140 afy of water required for operations. Therefore, the Boiler Optimization does not change the Water Resource section of the AFC, and no LORS will change as a result of the proposed enhancements. As a result, any potential Water Resource impacts associated with this optimization will be less than significant.

Worker Health and Safety

The Boiler Optimization does not change the Worker Health and Safety section of the AFC, and no LORS will change as a result of the proposed enhancements. As a result, any potential Worker Health and Safety impacts associated with this optimization will be less than significant.

Visual Resources

BACKGROUND

An email data request was received from Melissa Mourkas of the CEC on February 1, 2012 requesting clarification of inconsistencies in the AFC about the water storage tanks.

DATA REQUEST

VR-1. I need some clarification regarding the water storage tanks listed in AFC Table 5.13-4. The list includes a Raw Water/Fire Water Tank, an HQ Demineralized Water Tank and an IQ Demineralized Water Tank. In looking at Figures 2.2-1, and 2.2-2aR1 and 2.2-2bR1, I count a total of four tanks described as:

#31. Demineralized Water Storage tank

#34. Service/Fire Water Tank

#42. Waste Water Storage Tank

#54. Wash Water Storage Tank

Can you clarify for me which one is which in the Table 5.13-4 and which one is not listed? That way, the analysis will be sure to have the correct dimensions and the nomenclature will match the figures in Section 2 of the AFC. If you have dimensions for the fourth tank and the fin-fan cooler, that would also be helpful.

Response: Due to the Boiler Optimization, a number of revisions have been made to Table 5.13-4 and to the above-referenced figures. Please refer to Table 5.13-4R1 in Attachment B, and the attached Figures 2.2-1R1, 2.2-2aR2, and 2.2-2bR2 (in Attachment A) for clarification of the number and location of tanks, for the dimensions of the tanks, and the fin fan cooler.

BACKGROUND

As a follow-up to our response to DR 35, CEC Staff inquired about the simulation of the view from KOP 4, particularly related to whether the viewer should be seeing the onsite transmission system in the view from this location.

VR-2 Please provide an explanation as to why the viewer should, or should not, be seeing the onsite transmission system from KOP 4.

Response: A response was provided to the CEC by Tom Priestley via email on February 13, 2012. In the response he indicated that the Applicant "worked with our simulation specialist to take a very careful look at what was done in creating the simulation. Attached is a screen shot (refer to VR2-1, attached) that our simulation specialist provided of a portion of the digital model that was used to create the simulations. As you can see, the model we used included the transmission structures that carry the lines that transport the electricity from the power blocks to the switchyard. This screen shot also provides the answer to your question about how many transmission structures there are on the site.

"The other file I have attached (see Figure VR2-2, attached) is a view cone diagram that provides an understanding of the physical relationships between the viewpoint and the various elements in the view. This diagram provides a basis for understanding that the transmission structures are in the portion of the view where they will be hidden by the structures and vegetation in the foreground and middleground. The vegetation in the foreground and middleground extends to the road at the left side of the view. If you extend this road north through the project site, you can see that this line transects the northern boundary of the Power Block 1 heliostat field at a point west of the location where the above-ground portion of the internal transmission system begins. As a consequence, the Power Block 1 transmission line is located entirely behind the foreground and middleground screening. In addition, review of this view cone diagram indicates that the area where the Power Block 2 transmission line is located lies outside the area the photo encompasses."

Subsequent to providing this data response, Applicant has made revisions to the location of the switchyard that will eliminate the need for aboveground transmission lines on the project site. Therefore, the number and appearance of the onsite transmission structures is no longer an issue. With the Boiler Optimization enhancements and relocation of the switchyard offsite, all onsite gen-tie lines will be undergrounded, eliminating all onsite transmission structures.

BACKGROUND

During the February 22, Data Resolution Workshop, CEC Staff requested the following.

VR-3. Staff would like to know how many transmission poles are onsite.

Response: As noted in the Boiler Optimization description (Data Response PD-1) with the relocation of the switchyard offsite, the plan is to underground all internal transmission lines. As a result of this undergrounding, there will be no transmission poles onsite.

VR-4 Staff would like to see a KOP that shows the transmission lines from Tecopa Road looking toward the project; from somewhere between KOP3 and the stateline.

Response: A simulation from Tecopa Road between KOP 3 and the state line for the purpose of capturing a view of the onsite transmission lines is no longer pertinent because in the revised design, all of the onsite transmission lines have been placed underground.

BACKGROUND

On March 8, 2012, a meeting was held at the CEC to discuss the key observation points (KOPs) and visual simulations. At that meeting it was decided that the Applicant would provide a revised KOP 5.

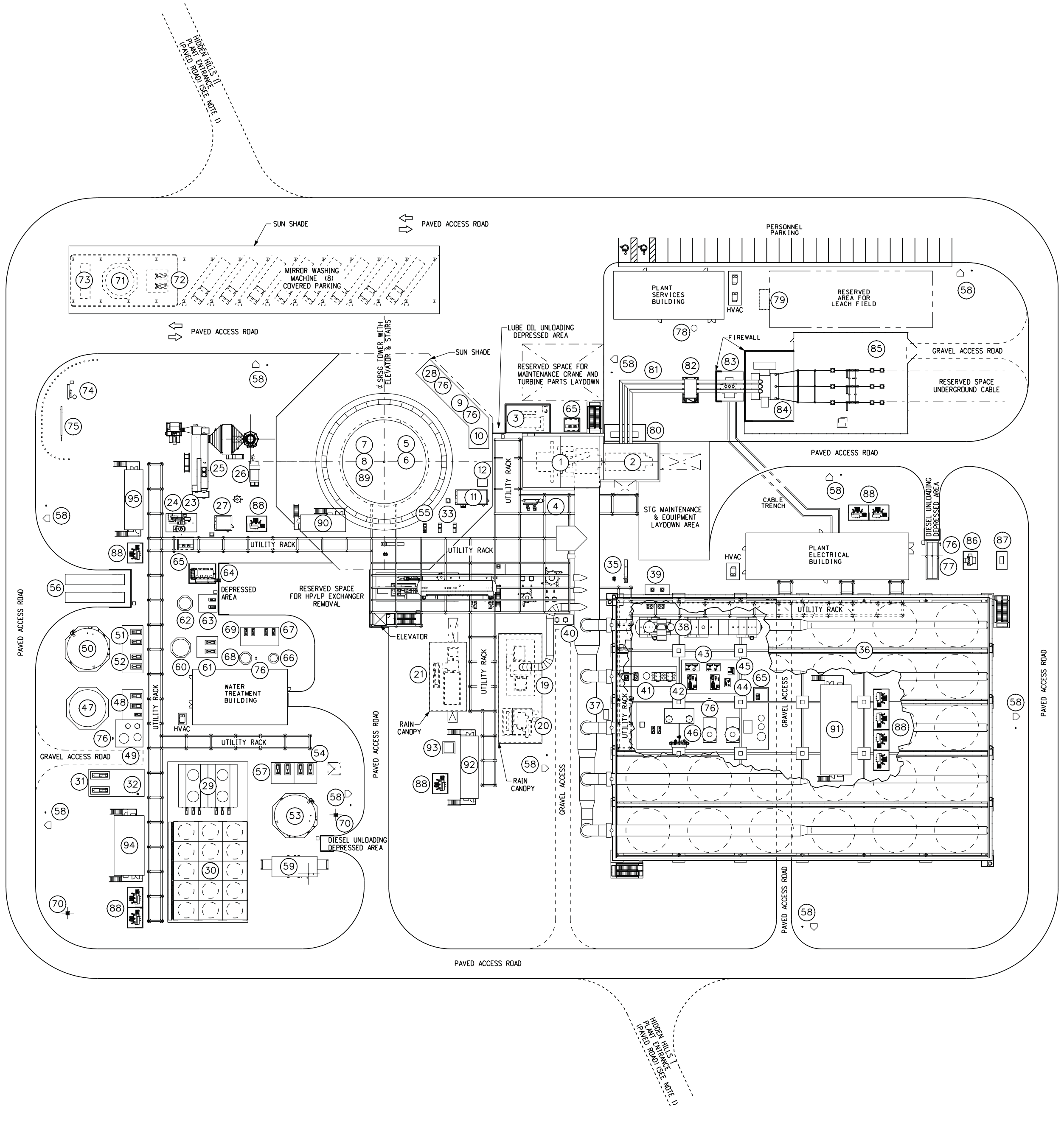
VR-5 Please provide a revised version of the KOP 5 simulation that depicts the correct location and scale of the project features and the most recent boiler design.

Response: All of the simulations, including the simulation from KOP 5, have been revised to reflect both the Boiler Optimization enhancements and the most recent design of the solar boiler, and all of these simulations have been prepared in a way that assures that they depict the project elements in the correct locations at the correct scale. These revised simulations are provided as Figures 5.13-2R1 through 5.13-7R1 and DR32-2R1. The revised simulation for KOP 5 is Figure 5.13-6R1 in this figure set.

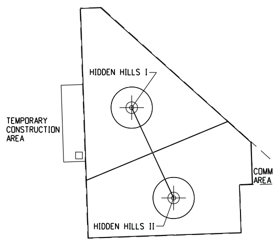
Attachment A
Figures

NOTES:

1. POWER BLOCK ARRANGEMENT FOR HIDDEN HILLS I AND II TO BE IDENTICAL WITH THE EXCEPTION OF PLANT ENTRANCE AND RADIAL DIRT ROAD LOCATIONS. SEE APROPRIATE CIVIL DRAWINGS.



ITEM	DESCRIPTION
1	STEAM TURBINE
2	GENERATOR
3	LUBE OIL UNIT
4	GLAND STEAM CONDENSER
5	SOLAR RECEIVER STEAM GENERATOR (SRSG)
6	BOILER CIRCULATION PUMPS (4) (SRSG)
7	SRSG FLASH TANK (TOWER)
8	SRSG BLOWDOWN TANK (TOWER)
9	SRSG CHEMICAL FEED EQUIPMENT
10	NITROGEN STORAGE
11	SRSG STEAM & WATER ANALYSIS SAMPLING SYSTEM (SWAS)
12	BYPASS VALVE HYDRAULIC SKID
13	SRSG BLOWDOWN COOLER
14	INTERNAL DRAIN TANK & PUMPS (2)
15	EXTERNAL DRAIN TANK & PUMPS (2)
16	HP FEEDWATER HEATERS (3)
17	LP FEEDWATER HEATERS (4)
18	DEAERATOR
19	MAIN BOILER FEEDWATER PUMP (TURBINE DRIVEN)
20	MAIN BOILER FEEDWATER PUMP L.O. PACKAGE
21	BACKUP BOILER FEEDWATER PUMP (MOTOR DRIVEN)
22	STARTUP BOILER FEEDWATER PUMP (MOTOR DRIVEN)
23	NIGHT PRESERVATION BOILER (NPB)
24	NIGHT PRESERVATION BOILER FEEDWATER PUMPS (2)
25	AUXILIARY BOILER
26	AUXILIARY BOILER FEEDWATER PUMPS (2)
27	AUX BOILER STEAM & WATER ANALYSIS SAMPLING SYSTEM (SWAS)
28	NPB & AUX BOILER CHEMICAL FEED EQUIPMENT
29	WET SURFACE AIR COOLER (WSAC)
30	DRY FIN-FAN COOLERS
31	CLOSED COOLING WATER (CCW) PUMPS (2)
32	CCW CHEMICAL ADDITION TANK
33	CCW BOOSTER PUMPS (2)
34	CCW HEAD TANK
35	BLOWDOWN / CONDENSATE HEAT EXCHANGER
36	AIR COOLED CONDENSER (ACC)
37	ACC WASH WATER SYSTEM SKID
38	CONDENSATE COLLECTION TANK
39	CONDENSATE PUMPS (2)
40	STEAM DUCT DRAIN PUMPS (2)
41	PLANT AIR EQUIPMENT
42	CONDENSER VACUUM PUMPS (2)
43	CONDENSER VACUUM PUMPS FIN FAN COOLERS (2)
44	NIGHT TIME VACUUM PUMP
45	NIGHT TIME VACUUM PUMP FIN FAN COOLER
46	CONDENSATE POLISHER EQUIPMENT
47	DEMINERALIZED WATER STORAGE TANK
48	DEMINERALIZED WATER TRANSFER PUMPS (2)
49	DEMINERALIZER SYSTEM EQUIPMENT
50	TREATED WATER STORAGE TANK
51	TREATED WATER TRANSFER PUMPS (2)
52	DEMINERALIZER FEED PUMPS (2)
53	SERVICE / FIRE WATER STORAGE TANK
54	SERVICE WATER TRANSFER PUMPS (2)
55	SERVICE WATER BOOSTER PUMP (1)
56	RAW WATER TREATMENT TRAILERS (2)
57	RAW WATER TREATMENT FEED PUMPS (2)
58	FIRE HYDRANT & HOSE HOUSE (10)
59	FIRE PUMPS MODULE (ELECTRIC, DIESEL & JOCKEY)
60	WASTEWATER COLLECTION TANK
61	WASTEWATER FEED PUMPS (2)
62	WASTEWATER RESIDUE TANK
63	WASTEWATER RESIDUE PUMPS (2)
64	OILY WATER SEPARATOR
65	SUMP PUMPS
66	POTABLE WATER STORAGE TANK
67	POTABLE WATER SUPPLY PUMPS (2)
68	POTABLE WATER TREATMENT SYSTEM FEED TANK
69	POTABLE WATER FEED PUMPS (2)
70	WELL PUMP (2)
71	MIRROR WASH WATER STORAGE TANK
72	MIRROR WASH WATER FILLING PUMPS (2)
73	DIESEL FUEL STORAGE TANK
74	FUEL GAS FILTRATION/HEATING EQUIPMENT
75	FUEL GAS PIG RECEIVER / LAUNCHER (BY SUBCONTRACTOR)
76	EMERGENCY EYEWASH & SHOWER
77	EMERGENCY DIESEL GENERATOR
78	SANITARY LIFT STATION (UNDERGROUND)
79	SEPTIC TANK & LEACH FIELD
80	EXCITATION CONTAINER
81	ISOPHASE BUS DUCT
82	GENERATOR CIRCUIT BREAKER
83	UNIT AUXILIARY TRANSFORMER
84	GENERATOR STEP-UP TRANSFORMER
85	230KV PLANT SUB-STATION
86	STATION SERVICE TRANSFORMER
87	24.9kV BREAKER
88	MCC OIL FILLED TRANSFORMER (11)
89	ELECTRICAL EQUIPMENT MODULE FOR SRSG (TOWER)
90	ELECTRICAL EQUIPMENT MODULE FOR SRSG
91	ELECTRICAL EQUIPMENT MODULE FOR ACC
92	ELECTRICAL EQUIPMENT MODULE FOR BFP
93	LIQUID TO AIR REMOTE HEAT EXCHANGER (VFD)
94	ELECTRICAL EQUIPMENT MODULE FOR FIN FAN/WSAC & WATER TREATMENT AREA
95	ELECTRICAL EQUIPMENT MODULE FOR AUXILIARY BOILER



KEY PLAN

TRUE NORTH

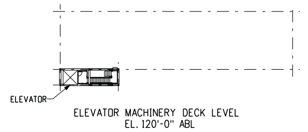
N

PLANT NORTH

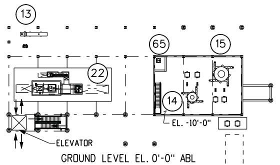
SITE LOCATION & ROTATION

HIDDEN HILLS I
TOWER LOCATION: N. 99,052.05 E. 30,426.00
ROTATION: 0° CLOCKWISE

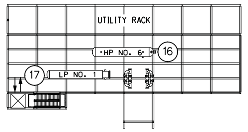
HIDDEN HILLS II
TOWER LOCATION: N. 92,842.05 E. 33,310.00
ROTATION: 0° CLOCKWISE



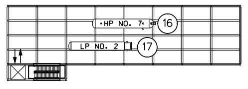
ELEVATOR MACHINERY DECK LEVEL
EL. 120'-0" ABL



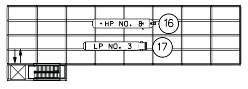
GROUND LEVEL EL. 0'-0" ABL
BELOW HEATER BAY STRUCTURE



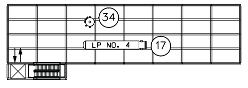
HP / LP HEATER DECK LEVEL EL. 20'-0" ABL
(OPERATING DECK LEVEL)



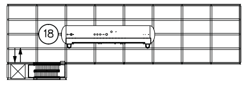
HP / LP HEATER DECK LEVEL EL. 50'-0" ABL



HP / LP HEATER DECK LEVEL EL. 70'-0" ABL



LP HEATER DECK LEVEL EL. 90'-0" ABL

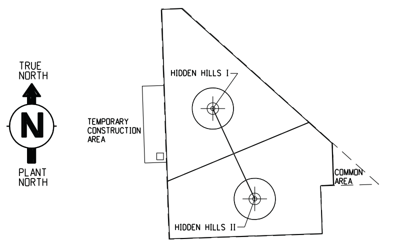


DEAERATOR DECK LEVEL EL. 110'-0" ABL

0 60 120 180 240FT

FIGURE 2.2-1-R1
Power Block Plot Plan
Hidden Hills Solar Electric Generating System

Source: Bechtel Power Corp., Drawing 000-P1-0010-00001, 02/06/2012.



KEY PLAN

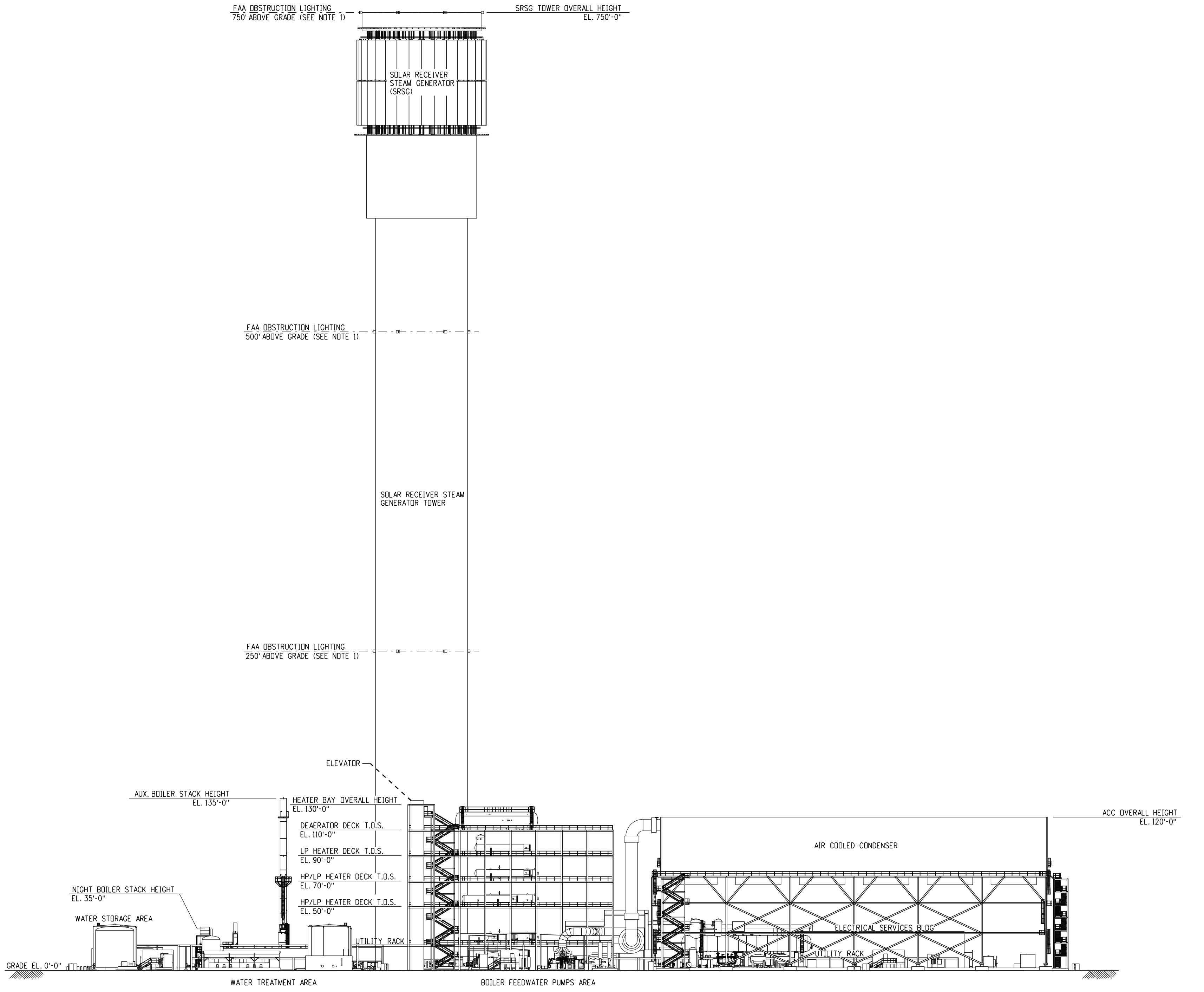
SITE LOCATION & ROTATION

HIDDEN HILLS I
TOWER LOCATION: N. 99,052.05 E. 30,426.00
ROTATION: 0° CLOCKWISE

HIDDEN HILLS II
TOWER LOCATION: N. 92,842.05 E. 33,310.00
ROTATION: 0° CLOCKWISE

NOTES:

1. FAA OBSTRUCTION LIGHTING:
HIGH INTENSITY FLASHING WHITE OBSTRUCTION LIGHT SYSTEM (HIWOL)
SIX LIGHT UNITS PER LEVEL (0°, NORTH 60°, 120°, 180°, SOUTH, 240°, 300°)

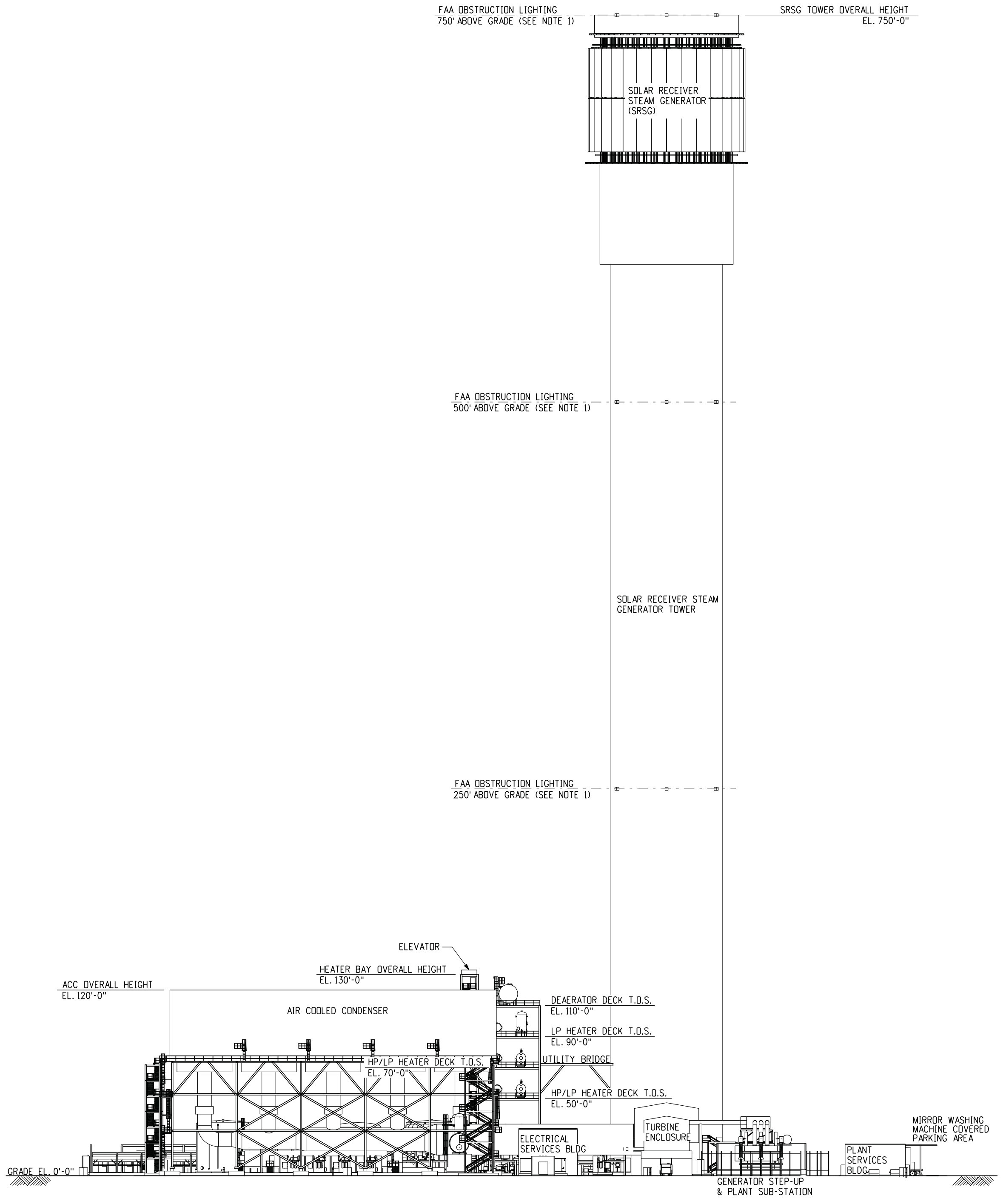


ELEVATION VIEW LOOKING NORTH

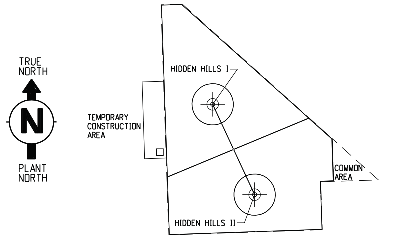
0 60 120 180 240FT

Source: Bechtel Power Corp., Drawing 000-P1K-0090-00001, 03/28/2012.

FIGURE 2.2-2a-R2
Elevation Looking North
Hidden Hills Solar Electric Generating System



ELEVATION VIEW LOOKING WEST



KEY PLAN

SITE LOCATION & ROTATION

HIDDEN HILLS I
TOWER LOCATION: N. 99,052.05 E. 30,426.00
ROTATION: 0° CLOCKWISE

HIDDEN HILLS II
TOWER LOCATION: N. 92,842.05 E. 33,310.00
ROTATION: 0° CLOCKWISE

NOTES:

1. FAA OBSTRUCTION LIGHTING:
HIGH INTENSITY FLASHING WHITE OBSTRUCTION LIGHT SYSTEM (HIWOL)
SIX LIGHT UNITS PER LEVEL (0°, NORTH 60°, 120°, 180°, SOUTH, 240°, 300°)

Source: Bechtel Power Corp., Drawing 000-P1K-0090-00004, 03/28/2012.

FIGURE 2.2-2b-R2
Elevation Looking West

Hidden Hills Solar Electric Generating System

A. KOP-1. Existing view toward the project site from Tecopa Road traveling southbound, 1.75 miles northeast of the project site.

B. KOP-1. Simulated view toward the project site from Tecopa Road traveling southbound, 1.75 miles northeast of the project site.

FIGURE 5.13-2 R1
KOP-1. View from Tecopa Road Southbound
Hidden Hills Solar Electric Generating System

A. KOP-2: Existing view toward the project site from the Stump Springs ACEC.

B. KOP-2: Simulated view toward the project site from the Stump Springs ACEC.

FIGURE 5.13-3 R1
KOP-2. View from Tecopa Road crossing at Stump Springs ACEC
Hidden Hills Solar Electric Generating System

A. KOP-3: Existing view toward the project site from Tecopa Road in front of the St. Therese Mission project.

B. KOP-3: Simulated view toward the project site from Tecopa Road in front of the St. Therese Mission project.

FIGURE 5.13-4 R1
KOP-3. View from the Proposed St. Therese Mission
Hidden Hills Solar Electric Generating System

A. KOP-4: Existing view toward the project site from the rural residential community of Charleston View (aka Calvada Springs).

B. KOP-4: Simulated view toward the project site from the rural residential community of Charleston View (aka Calvada Springs).

FIGURE 5.13-5 R1
KOP-4. View from Charleston View
Hidden Hills Solar Electric Generating System

A. KOP-5: Existing view toward the project site from Tecopa Road traveling eastbound, 3.8 miles west of the project site.

B. KOP-5: Simulated view toward the project site from Tecopa Road traveling eastbound, 3.8 miles west of the project site.

FIGURE 5.13-6 R1
KOP-5. View from Tecopa Road Eastbound
Hidden Hills Solar Electric Generating System

A. KOP-6: Existing view toward the project site from Homestead Road at Thorne Drive in the rural residential area south of Pahrump.

B. KOP-6: Simulated view toward the project site from Homestead Road at Thorne Drive in the rural residential area south of Pahrump.

FIGURE 5.13-7 R1

KOP-6. View from Pahrump

Hidden Hills Solar Electric Generating System

A. KOP-7: Existing view toward the project site from Garnet Road, 1.75 miles south of Tecopa Road.

B. KOP-7: Simulated view toward the project site from Garnet Road, 1.75 miles south of Tecopa Road.

FIGURE DR 32-2 R1
KOP-7. View from Garnet Road
Hidden Hills Solar Electric Generating System

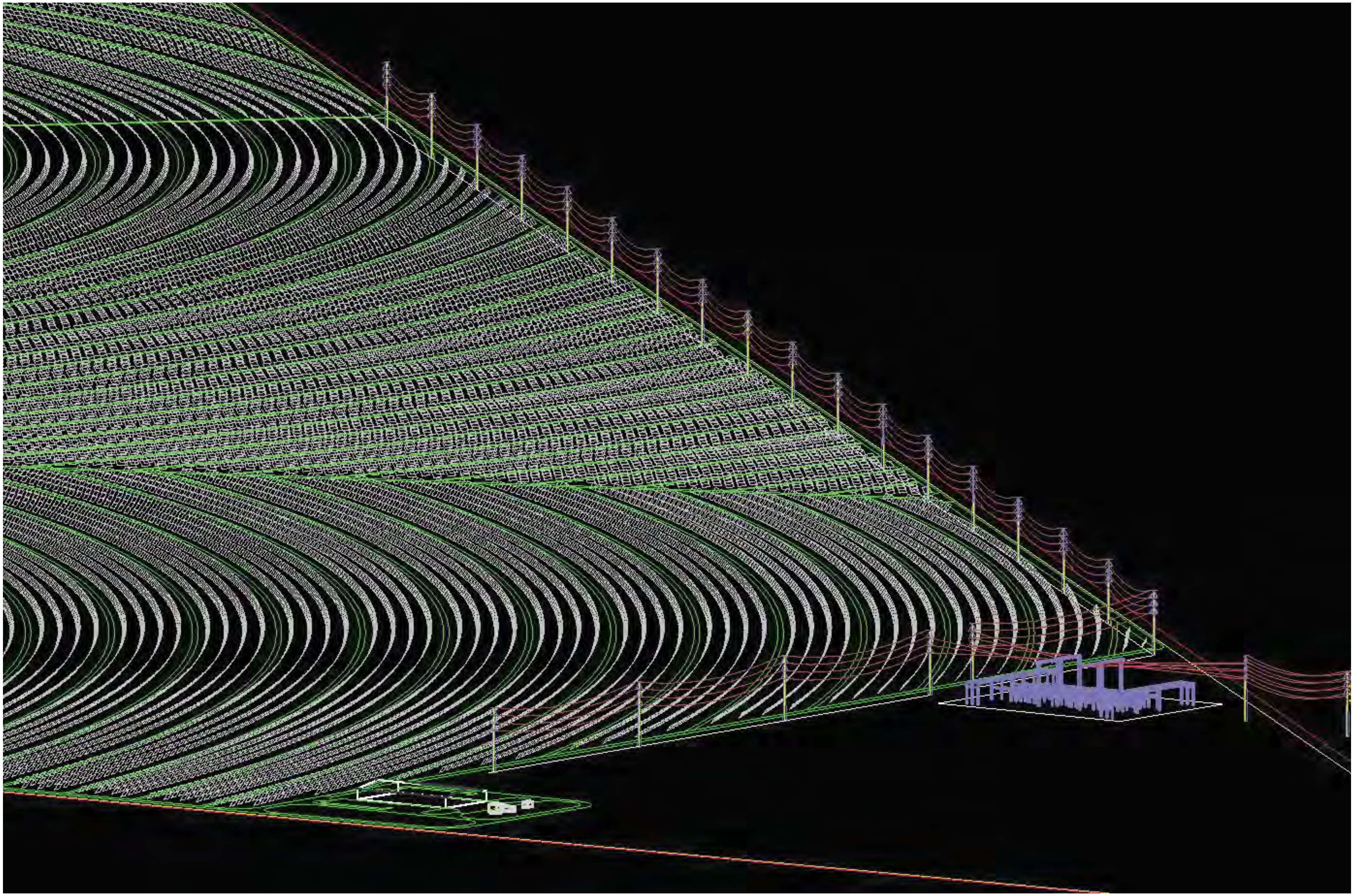
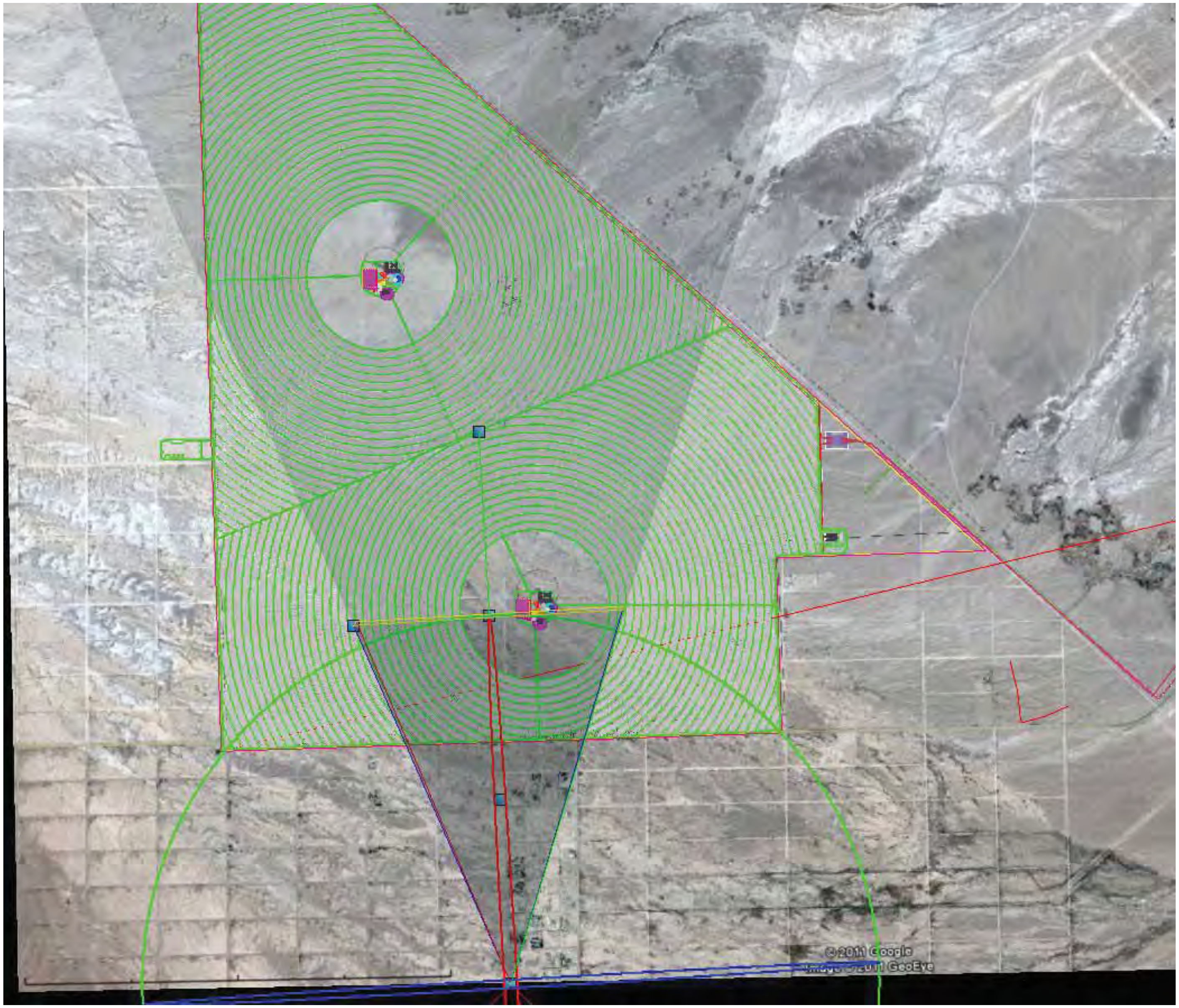


FIGURE VR-1
Screen Shot of Digital Model for Visual Simulation
Hidden Hills Solar Electric Generating System



Aerial image courtesy of Google™ Earth, 2011. Image ©2011 GeoEye.

FIGURE VR-2
View Cone Diagram for KOP 4
Hidden Hills Solar Electric Generating System

CH2MHILL

Attachment B
Tables

TABLE 2.3-1R1
Major Equipment Redundancy

Description	Number	Note
Solar Receiver Steam Generators	One per plant	
SRSG Superheater	One per plant	
SRSG Circulating Pumps	Four – 25 percent capacity per plant	One spare per facility in warehouse
STG	One per plant	
Boiler feedwater pump – Turbine Driven	One – 100 percent capacity per plant	One spare per facility in warehouse (consisting of a spare pump cartridge for main pump, one complete spare booster pump, and key spare parts for turbine drive)
Backup Boiler feedwater pump – Motor Driven	One – 50 percent capacity per plant	One spare main and booster pump, including driver, and variable frequency drive (VFD) per facility in warehouse
Condensate pumps	Two – 50 percent capacity per plant	One spare pump, driver, and VFD per facility in warehouse
Condenser	One per plant	
Demineralization water treatment system	Two – 100 percent capacity vessels per plant	
Raw water treatment trailers	Two – 100 percent capacity trailers per plant	

TABLE 2.3-2R1
Power Block Major Equipment and Facility List

Steam Turbine
Generator
Auxiliary Boilers
Night Preservation Boilers
Air-cooled Condenser
Feed Water Heaters
Boiler Feed Pumps
Plant Services Building
Plant Electrical Building
Water Treatment Building
Underground Gas Pipeline
Condensate Pump
Emergency Diesel Generator
Administration/Control Building
SRSG, including a Superheater
Solar Power Tower
Switchyard
Fire Pump Engines
Generator Step-up Transformer
Unit Auxiliary Transformer
Station Services Transformer
Service/Firewater Tank
Electrical Equipment Module(s)
Demineralized Water Tank
Well Water Pumps
Treated Water Tank
Access Roadway
230-kV Generation Tie Line

TABLE PD1-1
Maximum Facility Natural Gas Fuel Use, Total, All Units (MMBtu)

Pollutant	Original (AFC) Design	Optimized Design
Per Hour	3,522.5	528.0
Per Day	22,290	3,440
Per Year	1,696,376	746,400

TABLE PD1-2
Reductions in Annual Emissions, tons per year

Pollutant	Original (AFC) Design	Optimized Design
NOx	12.3	8.3
SO_2	1.8	0.8
CO	30.2	12.9
VOC	4.8	3.1
$PM_{10}/PM_{2.5}$	4.4	2.1
CO_2e	99,700	44,394

TABLE PD1-3
Annual Emissions from Mirror Cleaning Activities, tons per year (Total, Both Plants)

Pollutant	Original (AFC) Design	Optimized Design
NOx	13.7	0.7
SO_2	0.24	0.2
CO	4.0	0.03
VOC	6.5	0.3
PM_{10}	3.7	6.3
$PM_{2.5}$	0.8	0.6
DPM	0.5	0.02
CO_2e	25,673	21,147

TABLE PD1-4
Maximum Modeled Impacts

Pollutant	Averaging Period	Project Impact, Original (AFC) Design, without MWMs[a] (μg/m^3)	Project Impact, Original (AFC) Design, with MWMs[b] (μg/m^3)	Project Impact, Optimized Design, with MWMs[c] (μg/m^3)
NOx	1-hr (max)	220	80	184
	1-hr (98th ptl)	166	49	141
	Annual	0.1	0.3	0.2
SO_2	1-hr	19	17	11
	3-hr	8.7	8.7	5.8
	24-hr	0.5	0.5	0.3
	Annual	0.01	<0.1	0.01
CO	1-hr	262	262	256
	8-hr	64	59	27
PM_{10}	24-hr	1.1	2.5	0.8
	Annual	0.02	0.4	0.02
$PM_{2.5}$	24-hr	1.1	1.2	0.8
	Annual	0.02	<0.1	0.02

[a] AFC analysis assumed that the emergency engines would not be tested on a day when the auxiliary boilers were in operation. Modeling results represent the higher of emergency engine or boiler impacts for short-term (24-hour or less) impacts.
[b] Original analysis (from Data Response 146) assumed that the MWMs would not operate on a day when the emergency engines were in operation. Modeling results represent impacts from boilers and MWMs only, excluding emergency engines.
[c] Analysis of Boiler Optimization assumes that emergency engines may operate concurrently with auxiliary boilers and MWMs. Modeling results represent total impacts from boilers, emergency engines and MWMs.

TABLE PD1-5
Potential Health Risks from the Operation of the Project, Including Mirror Washing Machines

	Original AFC Design	Boiler Optimization[c]	Significance Thresholds	Significant?
Maximum Incremental Cancer Risk (MICR) at Point of Maximum Impact	0.39 in one million[a]	2.8 in one million	10 in one million	No
MICR at Residential Receptor	1.4 in one million[b]	0.5 in one million	10 in one million	No
Acute Inhalation Health Hazard Index: 1-hour	0.004	0.003	1.0	No
Acute Inhalation Health Hazard Index: 8-hour	0.004	0.002	1.0	No
Chronic Inhalation Health Hazard Index	0.0002	0.001	1.0	No

[a] The analysis in the AFC did not include emissions from the MWMs.
[b] From Data Response 146; includes MWMs.
[c] Includes MWMs.

TABLE 5.5-2R1
Use and Location of Hazardous Materials at HHSEGS

Chemical	Use	Storage Location	State	Type of Storage
Nalco Elimin-OX (or similar oxygen scavenger)	Oxygen scavenger for boiler chemistry control and metal passivation	Power Block: Containers near power tower	Liquid	300-gallon Tote Continuously Onsite
Aqueous Ammonia (19% concentration)	pH control for boiler chemistry control	Power Block: Containers near power tower	Liquid	300-gallon Tote Continuously Onsite
Sulfuric Acid (93% -66° Baumé)	pH control	Power Block: Containers in water treatment building	Liquid	300-gallon Tote Continuously Onsite
Sulfuric Acid (Batteries)	Electrical power	Power Block: Contained within the main electrical room and the power tower Common Area: Contained within main electrical room	Solid/liquid	Batteries
Sodium hydroxide (50% NaOH)	pH control	Power Block: Containers in water treatment building	Liquid	300-gallon Tote Continuously Onsite
Diesel Fuel (No. 2)	Emergency generator	Power Block: Near fire pump and beneath emergency diesel generator Common Area: Near fire pump, beneath emergency diesel generator and adjacent to the mirror wash machines water filling station	Liquid	Aboveground storage tanks and in equipment Continuously Onsite
Paint, solvents, adhesives, cleaners, sealants, lubricants	Equipment Maintenance	Power Block: Maintenance shop	Liquid	1-gal and 5-gal containers
Cleaning Chemicals and Detergents	Periodic cleaning of steam	Power Block: Maintenance shop	Liquid	Misc. Manufacturer’s containers Continuously Onsite
Anti-scalant (Nalco 5200M or similar)	Wastewater treatment chemistry control	Power Block: Containers in water treatment building	Liquid	300-gallon Tote Continuously Onsite
Anti-foaming Agent (Nalco 7468 or similar)	Wastewater treatment chemistry control	Power Block: Containers in water treatment building	Liquid	300-gallon Tote Continuously Onsite
Corrosion Inhibitor (Nalco 3DT-187 or similar)	Wet Surface Air Cooler (WSAC) chemistry control	Power Block: Containers in water treatment building	Liquid	300-gallon Tote Continuously Onsite
Dispersant (Nalco 73801WR or similar)	Wet Surface Air Cooler (WSAC) chemistry control	Power Block: Containers in water treatment building	Liquid	300-gallon Tote Continuously Onsite

TABLE 5.5-2R1
Use and Location of Hazardous Materials at HHSEGS

Chemical	Use	Storage Location	State	Type of Storage
Corrosion Inhibitor (Nalco TRAC107 or similar)	Closed Cooling Water chemistry control	Power Block: Containers in water treatment building	Liquid	55-gallon Drums Continuously Onsite
Sodium bisulfite (30% $NaHSO_3$)	Dechlorination	Power Block: Containers in water treatment building	Liquid	300-gallon Tote Continuously Onsite
Sodium hypochlorite (12% (trade) solution)	Biocide	Power Block: Containers in water treatment building	Liquid	300-gallon Tote Continuously Onsite
Lubricating Oil	Miscellaneous equipment lubrication	Power Block: Contained within equipment and within drums during replacement Common Area: Contained within equipment, spare capacity stored in Maintenance shop	Liquid	Contained continuously within equipment and misc. drums during replacement
Mineral Transformer Insulating Oil	Provides overheating and insulation protection for transformers	Power Block: Contained within transformers Common Area: Contained within transformers	Liquid	Contained continuously within transformers
Hydraulic Oil	Miscellaneous equipment control oil	Power Block: Contained within equipment and within drums during replacement Common Area: Contained within equipment, spare capacity stored in Maintenance shop	Liquid	Contained continuously within equipment and misc. drums during replacement
Sulfur hexafluoride	Switchyard/switchgear devices	Contained within equipment	Gas	Continuously onsite

TABLE 5.5-3R1

HHSEGS Chemical Inventory

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	EHS TPQ[c]	Regulated Substance TQ[d]	Prop 65
Nalco Elimin-OX (or similar oxygen scavenger)	Carbohydrazide	497-18-7	1,200 gallons	[e]	[e]	[e]	[e]	No
Aqueous Ammonia (19% concentration)	Ammonium hydroxide	1336-21-6	1,200 gallons	1000 lb	1000 lb	500 lb	[e]	No
Acid	Sulfuric acid (93% - 66° Baumé)	7664-93-9	1,200 gallons	1000 lb	1075 lb	1000 lb	[e]	No
Lead Acid Batteries	Composed of the following: Lead (45-60% of battery) Sulfuric Acid (10-30% of battery)	 7439-92-1 7664-93-9	420,000 lbm	10 lb	16 lb	[e]	[e]	Yes (lead)
Caustic	Sodium hydroxide 50%	1310-73-2	1,200 gallons	1000 lb	2000 lb	[e]	[e]	No
Diesel Fuel (No. 2)	Diesel Fuel	None	34,000 gallons	42 gal[f]	42 gal[f]	[e]	[e]	Yes
Cleaning Chemicals and Detergents	Various	None	2,500 gallons	[e]	[e]	[e]	[e]	No
Wastewater Treatment System Anti-scalant	Nalco 5200M or similar	Proprietary	1,200 gallons	[e]	[e]	[e]	[e]	No
Wastewater Treatment System Anti-foaming Agent	Nalco 7468 or similar	Proprietary	1,200 gallons	[e]	[e]	[e]	[e]	Yes
WSAC Corrosion Inhibitor	Nalco 3DT-187 or similar (Phosphoric acid 5%)	7664-38-2	1,200 gallons	5000 lb	100,000 lb	[e]	[e]	No
WSAC Dispersant	Nalco 73801WR or similar	Proprietary	1,200 gallons	[e]	[e]	[e]	[e]	No
Closed Cooling Water Corrosion Inhibitor	Nalco TRAC107 or similar	1310-73-2 & 1330-43-4	500 gallons	1000 lb	2000 lb	[e]	[e]	No
Bisulfite	Sodium bisulfite 30%	7631-90-5	1,500 gallons	5000 lb	16,667 lb	[e]	[e]	No
Sodium hypochlorite	Sodium hypochlorite 12% (trade)	7681-52-9	1,500 gallons	100 lb	800 lb	[e]	[e]	No
Lubricating Oil	Oil	None	40,000 gallons	42 gal[f]	42 gal[f]	[e]	[e]	Yes

TABLE 5.5-3R1
HHSEGS Chemical Inventory

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	EHS TPQ[c]	Regulated Substance TQ[d]	Prop 65
			(does not include oil contained within individual equipment and reservoirs)					
Mineral Transformer Insulating Oil	Oil	8012-95-1	100,000 gallons	42 gal[f]	42 gal[f]	[e]	[e]	Yes
Hydraulic Oil	Various Oil	None	5,000 gallons (does not include oil contained within individual equipment and reservoirs)	42 gal[f]	42 gal[f]	[e]	[e]	No
Sulfur hexafluoride	Sulfur hexafluoride	2551-62-4	1,300 lb	[e]	[e]	[e]	[e]	No

[a] Reportable quantity for a pure chemical, per CERCLA [Ref. 40 CFR 302, Table 302.4]. Release equal to or greater than RQ must be reported. Under California law, any amount that has a realistic potential to adversely affect the environment or human health or safety must be reported.

[b] Reportable quantity for materials as used onsite. Since some of the hazardous materials are mixtures that contain only a percentage of a reportable chemical, the reportable quantity of the mixture can be different than for a pure chemical. For example, if a material only contains 10% of a reportable chemical and the RQ is 100 lb., the reportable quantity for that material would be (100 lb.)/(10%) = 1,000 lb.

[c] Threshold Planning Quantity [Ref. 40 CFR Part 355, Appendix A]. If quantities of extremely hazardous materials equal to or greater than TPQ are handled or stored, they must be registered with the local Administering Agency.

[d] TQ is Threshold Quantity from 19 CCR 2770.5 (state) or 40 CFR 68.130 (federal)

[e] No reporting requirement. Chemical has no listed threshold under this requirement.

[f] State reportable quantity for oil spills that will reach California state waters [Ref. CA Water Code Section 13272(f)]

TABLE 5.13-4R1 (REVISED)
Approximate Dimensions and Colors, Materials, and Finishes of the Major Project Features

Feature	Power Block Equipment Identification #	Height (feet)	Length (feet)	Width (feet)	Diameter (feet)	Color	Materials	Finish
Buildings/Structures								
Admin/ Control/ Warehouse Building	in Common Area	14 (admin)/ 22 (warehouse)	325	85	NA		Metal	Flat/Untextured
Switchyard	moved offsite	36	420	310	NA	Gray & Silver		Flat/Untextured
Deaerator/ Feed Water Heaters (Steel Structure)	16, 17, 18	130	162	43	NA		Metal	Flat/Untextured
Mirror Wash Covered Parking	near 72	20	300	55	NA		Metal	Flat/Untextured
Plant Services Building	near 78	15	88	40	NA		Metal	Flat/Untextured
Plant Electrical Building	near ACC	30	132	38	NA		Metal	Flat/Untextured
Water Treatment Building	near 61, 76	30	150	85			Metal	Flat/Untextured
Tower and SRSG								
Solar Receiver Tower	near 5,6,7, 8, 89	590	NA	NA	72	Natural	Concrete	Natural concrete finish
Solar Receiver Steam Generator (SRSG)	on top of the Solar Receiver Tower	160 (actual boiler is about 67)	NA	NA	102	Black or Glowing Brightly	Metal	Flat/Untextured
Equipment								
Steam Turbine Generator	1, 2	45	110	46	NA		Metal	Flat/Untextured
Auxiliary Boiler	25	25	78	68			Painted	
Auxiliary Boiler Stack	near 25	135			5.5			Flat/Untextured
Night Preservation Boiler	23	14	25	15			Painted	
Night Preservation Boiler Stack	near 23	30			1.5			

TABLE 5.13-4R1 (REVISED)
Approximate Dimensions and Colors, Materials, and Finishes of the Major Project Features

Feature	Power Block Equipment Identification #	Height (feet)	Length (feet)	Width (feet)	Diameter (feet)	Color	Materials	Finish
Fin Fan Dry Coolers	30	13.5	80	60	NA	Rusted Finish	Metal	Flat/Untextured
Air-cooled Condenser (ACC)	36	120	310	218	NA		Metal	Flat/Untextured
Emergency Diesel Generator (Power Block)	77	10	30	9	NA		Metal	Flat/Untextured
Emergency Diesel Generator	In Common Area	7	15	6			Painted	
Generator Step-up Transformer	84	25 (concrete wall, 1 side)	40	58	NA	Gray	Metal	Flat/Untextured
Unit Auxiliary Transformer	83	14 (concrete wall, 1 side)	24	25	NA	Gray	Metal	Flat/Untextured
Tanks								
Service/Fire Water Storage Tank	53	32	NA	NA	34		Metal	Flat/Untextured
Treated Water Storage Tank	50	32			34		Metal	Flat/Untextured
Potable Water Storage Tank	66	9			6			Flat/Untextured
Potable Water Treatment System Feed Tank	68	10			8			Flat/Untextured
Demineralized Water Storage Tank	47	32	NA	NA	30		Metal	Flat/Untextured
Waste Water Collection Tank	60	25	NA	NA	14		Metal	Flat/Untextured
Mirror Wash Water Storage Tank	71	16	NA	NA	23		Metal	Flat/Untextured

Materials Sent to the Great Basin Unified Air Pollution Control District

sierra
research

1801 J Street
Sacramento CA 95811
Tel: (916) 444-6666
Fax: (916) 444-8373

Ann Arbor MI
Tel: (734) 761-6666
Fax: (734) 761-6755

March 30, 2012

Mr. Duane Ono
Deputy Air Pollution Control Officer
Great Basin Unified Air Pollution Control District
157 Short Street
Bishop, CA 93514-3537

Subject: BrightSource Energy Hidden Hills Solar Electric Generating Station Revisions to Application for Determination of Compliance and Authority to Construct

Dear Mr. Ono:

On behalf of BrightSource Energy, we are pleased to provide revised application forms for the proposed Hidden Hills Solar Electric Generating Station (HHSEGS) to be located in southern Inyo County. As we have discussed, BrightSource Energy has completed a coordinated design review and has decided to make the boiler system design for HHSEGS more consistent with that of the Ivanpah Solar Electric Generating System. The design change is referred to as the "Boiler Optimization."

Under the optimized project design, the number of boilers at each power block will be reduced from 5 to 2: the large auxiliary boilers have been eliminated, and the medium-sized and smallest boilers will remain. The operation of the remaining boilers has been re-optimized so that they will continue to support the operation of the solar receiver steam generating system in a more efficient and effective manner. Annual natural gas use in the boilers under the optimized design will be reduced by about half compared with the original design. Boiler Optimization will result in emission reductions of greenhouse gas and criteria pollutants for HHSEGS under all scenarios.

As in the original design, the solar field and power generation equipment will start each morning after sunrise and will shut down when insolation drops below the level required to keep the turbine online. Each solar plant will now include a 249 MMBtu/hr natural-gas-fired auxiliary boiler (previously called the "startup boiler"), which will be used to pre-warm the solar receiver steam generator to minimize the amount of time required for startup each morning, to assist during shutdown cooling operation, and to augment the solar operation during the evening shoulder period as solar energy diminishes. As in the original design, small natural gas fired nighttime preservation boilers will be used to maintain system temperatures overnight. The heat input rating of the nighttime preservation boilers is being increased slightly, from 12.2 MMBtu/hr to <15 MMBtu/hr. Minor changes are also being made in the models and ratings of the emergency Diesel and fire pump engines.

Revised versions of the original air quality and public health analyses are enclosed. To make the revised air quality analysis easier to review, we are providing two versions: one is in redline text (with changes to the original version shown in strikeout and underline fonts), and the other is a clean copy. We are also providing revised District permit application Forms A-3 and A-6 that reflect the proposed changes, as well as revised ambient air quality modeling and screening health risk assessment files on CD.

Thank you for your time and consideration in this matter. If you have any questions regarding this application, please contact Nancy Matthews or me at (916) 444-6666.

Sincerely,

Nancy Matthews

for Gary Rubenstein

Enclosures

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

Great Basin Unified Air Pollution Control District

Section A-3 ATC – PTO Application Fuel Burning Equipment

1. Person Completing Form: Nancy Matthews (Sierra Research)

Date: 04/01/2012 (*revised*)

APCD Appl. No. #1592

2. Facility Operating Schedule: Hours/Day 24 Days/Week 7 Weeks/Year 52

3. Reference Number	4. Equipment Manufacturer and Model Number	5. Rated Heat Capacity (BTU/Hour)	6. Type of Burner Unit (Use Code 1*)	7. Usage (Use Code 2*)	8. Heat Use	
					Percent Process	Percent Space Heating
B1A	Rentech or equivalent	249 million	10	01	100%	0%
B1B	Rentech or equivalent	249 million	10	01	100%	0%
B2A	Rentech or equivalent	15 million	10	01	100%	0%
B2B	Rentech or equivalent	15 million	10	01	100%	0%

*Burner Codes

01. Pulverized Coal – Wet Bottom
02. Pulverized Coal – Dry Bottom
03. Pulverized Coal – Cyclone Furnace
04. Spreader Stoker
05. Chain or Traveling Grate Stoker
06. Underfeed Stoker
07. Hand Fired Coal
08. Oil, Tangentially Fired
09. Oil, Horizontally Fired
10. Gas, Tangentially Fired
11. Gas, Horizontally Fired
12. Wood, with Fly-ash Reinjection
13. Wood, without Fly-ash Reinjection
14 Other (Specify Type)

*Usage Codes

01. Boiler, Steam
02. Boiler, Other (Specify)
03. Air Heating for Space Heating
04. Air Heating for Process Heating
05. Other (Specify)

Section A-3	ATC – PTO Application	Fuel Burning Equipment - Continued
9. Person Completing Form: Nancy Matthews (Sierra Research)	Date: 04/01/2012 (*revised*)	APCD Appl. No. #1592

10.	11. Stack or Exhaust Data				12. Fuel(s) Data				
Reference Number	Stack Height (Feet)	Exit Diameter (Feet)	Exit Gas Velocity (Feet/Min.)	Exit Gas Volume (ACFM*)	Max. Amount Burned/Hour (Specify Units)	Amount Per Year (Specify Units)	Heat Content BTU Gal., etc. (Specify Units)	% Sulfur[†]	% Ash
B1A	135	5.5	3,048	72,426	0.24 MMscf/hour	295 MMscf/year	1,020 Btu/scf	0.002	0
B1B	135	5.5	3,048	72,426	0.24 MMscf/hour	295 MMscf/year	1,020 Btu/scf	0.002	0
B2A	30	1.5	2,469	4,363	0.015 MMscf/hour	71 MMscf/year	1,020 Btu/scf	0.002	0
B2B	30	1.5	2,469	4,363	0.015 MMscf/hour	71 MMscf/year	1,020 Btu/scf	0.002	0

Reference: Number	Fuel Supplier Data	
	Type of Fuel	Supplier Name and Address
B1A	Natural Gas	N/A
B1B	Natural Gas	N/A
B2A	Natural Gas	N/A
B2B	Natural Gas	N/A

*ACFM – Actual Cubic Feet per Minute

N/A – Not Applicable

[†] Based on natural gas fuel sulfur content of 0.75 grains per 100 scf

Section A-3	ATC – PTO Application	Fuel Burning Equipment - Continued
13. Person Completing Form: Nancy Matthews (Sierra Research)	Date: 04/01/2012 (*revised*)	APCD Appl. No. #1592

14.	15. Air Pollution Control Equipment				16. Emission Rates[1]					
			Efficiency		(Give in Units of Tons per Year)					
Reference Number	Manufacturer And Model Number	Type (Use Codes)*	Design Percent	Actual Percent	Particulates ($PM_{10}/PM_{2.5}$)	Sulfur Oxides	Carbon Monoxide	Volatile Organic Compounds	Nitrogen Oxides	Basis For Emission Est.
B1A	TBD	14 (low-NOx burner with flue gas recirculation)	TBD	TBD	0.8	0.3	4.5	1.3	2.7	NOx, CO, VOC: guaranteed emission rates SO_2: stoichiometric calculation based on fuel sulfur content $PM_{10}/PM_{2.5}$: emission factors
B1B	TBD	14 (low-NOx burner with flue gas recirculation)	TBD	TBD	0.8	0.3	4.5	1.3	2.7	
B2A	TBD	14 (low-NOx burner with flue gas recirculation)	TBD	TBD	0.2	0.1	1.4	0.2	0.5	
B2B	TBD	14 (low-NOx burner with flue gas recirculation)	TBD	TBD	0.2	0.1	1.4	0.2	0.5	

*Air Pollution Control Equipment Codes

01 Settling Chamber
02. Cyclone
03. Multicyclone
04. Cyclone Scrubber
05. Orifice Scrubber
06. Mechanical Scrubber
07. Ventural Scrubber
08. Mist Eliminator
09. Electrostatic Precipitator
10. Baghouse (Fabric Filter)
11. Catalytic Afterburner
12. Direct Flame Afterburner
13. Packed Tower
14. Other (Specify)

For Wet Scrubbers, List Gallons per Minute Water Flow and Inches Water Pressure Drop Across Scrubber if Known.

---

[1] Emission rates reflect normal operating hours and cold start-up.

Theodore Schade
Control Officer

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

157 Short Street * Bishop, California 93514 * (760) 872-8211 * Fax (760) 872-6109

Section A-6 Diesel Fired ICE Permit Application pursuant to Health & Safety Code ' 93115 (e)(4)(A)3.

ENGINE INFORMATION : (use a separate form for each engine) *EG1A*

Engine Manufacturer: *Caterpillar* or equivalent

Model Name: ~~*C175-16 SCAC*~~ 3516C or equivalent

EPA 12-Character Family Name: *TBD* *(Tier 2)*

Serial Number: *TBD*

Year of Manufacture: *2013 (assumed year of purchase)*

Maximum Rated Brake Horsepower (bhp): ~~3,354~~ 3,633

Stack Height from Ground (feet): ~~*12*~~ *18*, Exhaust Stack Diameter (inches): ~~*20*~~ *18*

Direction of Stack (horz.or vert): *vert*, End of Stack (open or capped): *open*

Physical Location of the Engine
(address or UTM coordinates): *N 3,983,971.385 / E 598,605.748*

OPERATIONAL INFORMATION

Describe the General Use of the Engine: *emergency back-up power*

Typical Load (percent of maximum bhp rating): *100%*

Typical annual hours of operation: *50*

If seasonal, months of year operated: *Not Applicable*

If seasonal, typical hours per month operated: *Not Applicable*

Fuel usage rate (if available) gallons/hour: *175*

Maximum operating schedule: Hourly *0.5*, Daily *0.5*, Quarterly *12.5*, Yearly *50*,

Fuel used (circle one): [✓ CARB Diesel], Jet fuel, Diesel, Alternative diesel fuel (specify), Alternative fuel (specify), Combination (Dual fuel)(specify), Other (specify):

EXHAUST CONTROL TECHNOLOGY

Pollution Control Equipment (circle): [✓ Turbo Charger, Aftercooler,] Catalyst, Injection Timing Retarding, Diesel Particulate Filter, Other:

Is the engine equipped with an exhaust after-treatment system (e.g., a particulate filter, catalyst), or other modification to the engine to reduce exhaust emissions? If yes, please provide the name of the manufacturer, model, and the CARB executive order number. Please attach a photocopy of the manufacturers= product literature: *Not Applicable*

If a Diesel Particulate Filter (DPF) is used, identify the type of back pressure monitor that will be installed. Attach a copy of the manufacturers= literature.

Manufacturer: *Not Applicable*, Model Name: *Not Applicable*

Serial Number:______*Not Applicable*________, Pressure & Temperature Range:__*Not Applicable*____

EMISSION FACTORS

Emission factors form the basis for calculating the mass emissions from the engine. The District will use default emission factors based on the engine=s EPA Tier standard. Older engines are assigned the current EPA AP-42 emission factors. If another reference measure is selected, provide the specific basis and attach detailed supporting documentation. *See attachment*

AP-42 emission factors	Lbs/hr[*]	Lbs/day	Tons/year[†]
PM_{10} 1.0 g/bhp-hr	~~0.2~~ 0.6	~~0.2~~ 0.6	~~0.01~~ 0.03
NOx (as NO2) 14.1 g/bhp-hr	~~20.3~~ 19.2	~~20.3~~ 19.2	1.0
NMHC (*as VOC*) 1.12 g/bhp-hr	~~0.5~~ 0.7	~~0.5~~ 0.7	~~0.025~~ 0.035
CO 3.0 g/bhp-hr	~~2.9~~ 10.4	~~2.9~~ 10.4	~~0.15~~ 0.5
SOx (as SO2) 3.67 * wt%S g/bhp-hr	0.02	0.02	0.001

hint: 454 grams = 1 pound

[*] *Based on 30-minute per hour operating time.*

[†] *Values reflect 50 hours per year of maintenance and testing operations.*

RECEPTOR INFORMATION (a receptor is any location outside the boundaries of a facility where a person may be exposed to diesel exhaust due to operation of the engine.)

Nearest receptor description (receptor type):______________*See Section 5.9 of AFC*__________________

Distance to nearest receptor (feet):_____________________*See Section 5.9 of AFC* _________________

Distance to the nearest school (feet):_____________________*>6 miles*______________________________

AB2588 INVENTORY

Is this engine included in an existing AB2588 inventory (yes or no):______________*No*___________

Theodore Schade
Control Officer

ALPINE MONO INYO

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
157 Short Street * Bishop, California 93514 * (760) 872-8211 * Fax (760) 872-6109

Section A-6 Diesel Fired ICE Permit Application pursuant to Health & Safety Code ' 93115 (e)(4)(A)3.

ENGINE INFORMATION : (use a separate form for each engine) *EG1B*

Engine Manufacturer: *Caterpillar* or equivalent

Model Name: ~~*C175-16 SCAC*~~ 3516C or equivalent

EPA 12-Character Family Name: *TBD* *(Tier 2)*

Serial Number: *TBD*

Year of Manufacture: *2013 (assumed year of purchase)*

Maximum Rated Brake Horsepower (bhp): ~~*3,354*~~ 3,633

Stack Height from Ground (feet): ~~*12*~~ *18*, Exhaust Stack Diameter (inches): ~~*20*~~ *18*

Direction of Stack (horz.or vert): *vert*, End of Stack (open or capped): *open*

Physical Location of the Engine
(address or UTM coordinates): *N 3,983,971.385 / E 598,605.748*

OPERATIONAL INFORMATION

Describe the General Use of the Engine: *emergency back-up power*

Typical Load (percent of maximum bhp rating): *100%*

Typical annual hours of operation: *50*

If seasonal, months of year operated: *Not Applicable*

If seasonal, typical hours per month operated: *Not Applicable*

Fuel usage rate (if available) gallons/hour: *175*

Maximum operating schedule: Hourly *0.5*, Daily *0.5*, Quarterly *12.5*, Yearly *50*,

Fuel used (circle one): [✓ CARB Diesel], Jet fuel, Diesel, Alternative diesel fuel (specify), Alternative fuel (specify), Combination (Dual fuel)(specify), Other (specify):

EXHAUST CONTROL TECHNOLOGY

Pollution Control Equipment (circle): [✓ Turbo Charger, Aftercooler,] Catalyst, Injection Timing Retarding, Diesel Particulate Filter, Other:

Is the engine equipped with an exhaust after-treatment system (e.g., a particulate filter, catalyst), or other modification to the engine to reduce exhaust emissions? If yes, please provide the name of the manufacturer, model, and the CARB executive order number. Please attach a photocopy of the manufacturers= product literature: *Not Applicable*

If a Diesel Particulate Filter (DPF) is used, identify the type of back pressure monitor that will be installed. Attach a copy of the manufacturers= literature.

Manufacturer: *Not Applicable*, Model Name: *Not Applicable*

Serial Number: *Not Applicable*, Pressure & Temperature Range: *Not Applicable*

EMISSION FACTORS

Emission factors form the basis for calculating the mass emissions from the engine. The District will use default emission factors based on the engine=s EPA Tier standard. Older engines are assigned the current EPA AP-42 emission factors. If another reference measure is selected, provide the specific basis and attach detailed supporting documentation. *See attachment*

AP-42 emission factors	Lbs/hr[*]	Lbs/day	Tons/year[†]
PM_{10} 1.0 g/bhp-hr	~~0.2~~ 0.6	~~0.2~~ 0.6	~~0.01~~ 0.03
NOx (as NO2) 14.1 g/bhp-hr	~~20.3~~ 19.2	~~20.3~~ 19.2	1.0
NMHC (*as VOC*) 1.12 g/bhp-hr	~~0.5~~ 0.7	~~0.5~~ 0.7	~~0.025~~ 0.035
CO 3.0 g/bhp-hr	~~2.9~~ 10.4	~~2.9~~ 10.4	~~0.15~~ 0.5
SOx (as SO2) 3.67 * wt%S g/bhp-hr	0.02	0.02	0.001

hint: 454 grams = 1 pound

[*] *Based on 30-minute per hour operating time.*

[†] *Values reflect 50 hours per year of maintenance and testing operations.*

RECEPTOR INFORMATION (a receptor is any location outside the boundaries of a facility where a person may be exposed to diesel exhaust due to operation of the engine.)

Nearest receptor description (receptor type): *See Section 5.9 of AFC*

Distance to nearest receptor (feet): *See Section 5.9 of AFC*

Distance to the nearest school (feet): *>6 miles*

AB2588 INVENTORY

Is this engine included in an existing AB2588 inventory (yes or no): *No*

Theodore Schade
Control Officer

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

157 Short Street * Bishop, California 93514 * (760) 872-8211 * Fax (760) 872-6109

Section A-6 Diesel Fired ICE Permit Application pursuant to Health & Safety Code ' 93115 (e)(4)(A)3.

ENGINE INFORMATION : (use a separate form for each engine) *EG1C*

Engine Manufacturer: *Caterpillar* or equivalent

Model Name: *C9 ATAAC* or equivalent

EPA 12-Character Family Name: *TBD* *(Tier 3)*

Serial Number: *TBD*

Year of Manufacture: *2013 (assumed year of purchase)*

Maximum Rated Brake Horsepower (bhp): ~~*335.4*~~ *398*

Stack Height from Ground (feet): ~~*10.5*~~ *15*, Exhaust Stack Diameter (inches): ~~*7*~~ *8*

Direction of Stack (horz.or vert): *vert*, End of Stack (open or capped): *open*

Physical Location of the Engine
(address or UTM coordinates): *N 3,982,537.261 / E 601,202.697*

OPERATIONAL INFORMATION

Describe the General Use of the Engine: *emergency back-up power to the common area*

Typical Load (percent of maximum bhp rating): *100%*

Typical annual hours of operation: *50*

If seasonal, months of year operated: *Not Applicable*

If seasonal, typical hours per month operated: *Not Applicable*

Fuel usage rate (if available)
gallons/hour: *20* ~~*19.4*~~

Maximum operating schedule: Hourly *0.5*, Daily *0.5*, Quarterly *12.5*, Yearly *50*,

Fuel used (circle one): [✓ CARB Diesel], Jet fuel, Diesel, Alternative diesel fuel (specify), Alternative fuel (specify), Combination (Dual fuel)(specify), Other (specify):

EXHAUST CONTROL TECHNOLOGY

Pollution Control Equipment (circle): [✓ Turbo Charger, Aftercooler,] Catalyst, Injection Timing Retarding, Diesel Particulate Filter, Other: *None*

Is the engine equipped with an exhaust after-treatment system (e.g., a particulate filter, catalyst), or other modification to the engine to reduce exhaust emissions? If yes, please provide the name of the manufacturer, model, and the CARB executive order number. Please attach a photocopy of the manufacturers= product literature: *Not Applicable*

If a Diesel Particulate Filter (DPF) is used, identify the type of back pressure monitor that will be installed. Attach a copy of the manufacturers= literature.
Manufacturer: *Not Applicable*, Model Name: *Not Applicable*

Serial Number:______*Not Applicable*________, Pressure & Temperature Range:_*Not Applicable*____

EMISSION FACTORS

Emission factors form the basis for calculating the mass emissions from the engine. The District will use default emission factors based on the engine=s EPA Tier standard. Older engines are assigned the current EPA AP-42 emission factors. If another reference measure is selected, provide the specific basis and attach detailed supporting documentation. *See attachment*

AP-42 emission factors	Lbs/hr*	Lbs/day	Tons/year†
PM_{10} 1.0 g/bhp-hr	~~0.03~~ 0.07	~~0.03~~ 0.07	~~0.001~~ 0.003
NOx (as NO2) 14.1 g/bhp-hr	~~1.1~~ 1.3	~~1.1~~ 1.3	0.1
NMHC (*as VOC*) 1.12 g/bhp-hr	~~0.5~~ 0.07	~~0.5~~ 0.07	~~0.002~~ 0.004
CO 3.0 g/bhp-hr	~~0.14~~ 1.1	~~0.14~~ 1.1	~~0.01~~ 0.06
SOx (as SO2) 3.67 * wt%S g/bhp-hr	0.002	0.002	1E-04

hint: 454 grams = 1 pound

**Based on 30-minute per hour operating time.*

†Values reflect 50 hours per year of maintenance and testing operations.

RECEPTOR INFORMATION (a receptor is any location outside the boundaries of a facility where a person may be exposed to diesel exhaust due to operation of the engine.)

Nearest receptor description (receptor type):______________*See Section 5.9 of AFC*__________________

Distance to nearest receptor (feet):_____________________*See Section 5.9 of AFC* _________________

Distance to the nearest school (feet):_____________________*>6 miles*_____________________________

AB2588 INVENTORY

Is this engine included in an existing AB2588 inventory (yes or no):______________*No*____________

Theodore Schade
Control Officer

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

157 Short Street * Bishop, California 93514 * (760) 872-8211 * Fax (760) 872-6109

Section A-6 Diesel Fired ICE Permit Application pursuant to Health & Safety Code ' 93115 (e)(4)(A)3.

ENGINE INFORMATION : (use a separate form for each engine) *FP1A*

Engine Manufacturer: *Cummins* or equivalent

Model Name: ~~*CFP9E-F40*~~ *CFP7E-F30* or equivalent

EPA 12-Character Family Name: ~~*ACEXL0540AAB*~~ *ACEXL0409AAB (Tier 3)*

Serial Number: *TBD*

Year of Manufacture: *2013 (assumed year of purchase)*

Maximum Rated Brake Horsepower (bhp): *200* ~~*271*~~

Stack Height from Ground (feet): *15* ~~*16*~~, Exhaust Stack Diameter (inches): 4

Direction of Stack (horz.or vert): *vert*, End of Stack (open or capped): *open*

Physical Location of the Engine
(address or UTM coordinates): *N 3,984,072.664 / E 598,629.814*

OPERATIONAL INFORMATION

Describe the General Use of the Engine: *emergency fire water pump*

Typical Load (percent of maximum bhp rating): *100%*

Typical annual hours of operation: *50*

If seasonal, months of year operated: *Not Applicable*

If seasonal, typical hours per month operated: *Not Applicable*

Fuel usage rate (if available)
gallons/hour: *12.0* ~~*14.0*~~

Maximum operating schedule: Hourly *0.5*, Daily *0.5*, Quarterly *12.5*, Yearly *50*,

Fuel used (circle one): [✓ CARB Diesel], Jet fuel, Diesel, Alternative diesel fuel (specify), Alternative fuel (specify), Combination (Dual fuel)(specify), Other (specify):

EXHAUST CONTROL TECHNOLOGY

Pollution Control Equipment (circle): [✓ Turbo Charger], Aftercooler, Catalyst, Injection Timing Retarding, Diesel Particulate Filter, Other: *None*

Is the engine equipped with an exhaust after-treatment system (e.g., a particulate filter, catalyst), or other modification to the engine to reduce exhaust emissions? If yes, please provide the name of the manufacturer, model, and the CARB executive order number. Please attach a photocopy of the manufacturers= product literature: *Not Applicable*

If a Diesel Particulate Filter (DPF) is used, identify the type of back pressure monitor that will be installed. Attach a copy of the manufacturers= literature.
Manufacturer: *Not Applicable*, Model Name: *Not Applicable*

Serial Number:______*Not Applicable*________, Pressure & Temperature Range:_____*Not Applicable*_____

EMISSION FACTORS

Emission factors form the basis for calculating the mass emissions from the engine. The District will use default emission factors based on the engine=s EPA Tier standard. Older engines are assigned the current EPA AP-42 emission factors. If another reference measure is selected, provide the specific basis and attach detailed supporting documentation. *See attachment*

AP-42 emission factors	Lbs/hr*	Lbs/day	Tons/year†
PM_{10} 1.0 g/bhp-hr	~~0.035~~ 0.033	~~0.035~~ 0.033	0.002
NOx (as NO2) 14.1 g/bhp-hr	0.65	0.65	~~0.05~~ 0.03
NMHC (*as VOC*) 1.12 g/bhp-hr	~~0.035~~ 0.04	~~0.035~~ 0.04	0.002
CO 3.0 g/bhp-hr	~~0.43~~ 0.57	~~0.43~~ 0.57	~~0.02~~ 0.03
SOx (as SO2) 3.67 * wt%S g/bhp-hr	0.0015	0.0015	~~7.5E-05~~ 6.3E-05

hint: 454 grams = 1 pound

**Based on 30-minute per hour operating time.*

†Values reflect 50 hours per year of maintenance and testing operations.

RECEPTOR INFORMATION (a receptor is any location outside the boundaries of a facility where a person may be exposed to diesel exhaust due to operation of the engine.)

Nearest receptor description (receptor type):______________*See Section 5.9 of AFC*__________________

Distance to nearest receptor (feet):_____________________*See Section 5.9 of AFC* _________________

Distance to the nearest school (feet):_____________________*>6 miles*______________________________

AB2588 INVENTORY

Is this engine included in an existing AB2588 inventory (yes or no):______________*No*___________

Theodore Schade
Control Officer

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

157 Short Street * Bishop, California 93514 * (760) 872-8211 * Fax (760) 872-6109

Section A-6 Diesel Fired ICE Permit Application pursuant to Health & Safety Code ' 93115 (e)(4)(A)3.

ENGINE INFORMATION : (use a separate form for each engine) *FP1B*

Engine Manufacturer:______*Cummins*_ or equivalent ____________________ ____________________

Model Name:__~~*CFP9E-F40*~~_*CFP7E-F30* or equivalent____

EPA 12-Character Family Name:__~~*ACEXL0540AAB*~~ *ACEXL0409AAB (Tier 3*)__________________

Serial Number:__________*TBD*____

Year of Manufacture:_______*2013 (assumed year of purchase)*________________________________

Maximum Rated Brake Horsepower (bhp):__*200*__~~*271*~~______________________________________

Stack Height from Ground (feet):_*15*__~~*16*~~_________, Exhaust Stack Diameter (inches):_____4________

Direction of Stack (horz.or vert):________*vert*________, End of Stack (open or capped):______*open*________

Physical Location of the Engine

(address or UTM coordinates):_________*N 3,984,072.664 / E 598,629.814*_________________________

OPERATIONAL INFORMATION

Describe the General Use of the Engine: *emergency fire water pump*

Typical Load (percent of maximum bhp rating): *100%*

Typical annual hours of operation: *50*

If seasonal, months of year operated: *Not Applicable*

If seasonal, typical hours per month operated: *Not Applicable*

Fuel usage rate (if available)
gallons/hour: *12.0* ~~*14.0*~~

Maximum operating schedule: Hourly *0.5*, Daily *0.5*, Quarterly *12.5*, Yearly *50*,

Fuel used (circle one): [✓ CARB Diesel], Jet fuel, Diesel, Alternative diesel fuel (specify), Alternative fuel (specify), Combination (Dual fuel)(specify), Other (specify):

EXHAUST CONTROL TECHNOLOGY

Pollution Control Equipment (circle): [✓ Turbo Charger], Aftercooler, Catalyst, Injection Timing Retarding, Diesel Particulate Filter, Other: *None*

Is the engine equipped with an exhaust after-treatment system (e.g., a particulate filter, catalyst), or other modification to the engine to reduce exhaust emissions? If yes, please provide the name of the manufacturer, model, and the CARB executive order number. Please attach a photocopy of the manufacturers= product literature: *Not Applicable*

If a Diesel Particulate Filter (DPF) is used, identify the type of back pressure monitor that will be installed. Attach a copy of the manufacturers= literature.
Manufacturer: *Not Applicable*, Model Name: *Not Applicable*

Serial Number:_____*Not Applicable*_______, Pressure & Temperature Range:____*Not Applicable*____

EMISSION FACTORS

Emission factors form the basis for calculating the mass emissions from the engine. The District will use default emission factors based on the engine=s EPA Tier standard. Older engines are assigned the current EPA AP-42 emission factors. If another reference measure is selected, provide the specific basis and attach detailed supporting documentation. *See attachment*

AP-42 emission factors	Lbs/hr[*]	Lbs/day	Tons/year[†]
PM_{10} 1.0 g/bhp-hr	~~0.035~~ 0.033	~~0.035~~ 0.033	0.002
NOx (as NO2) 14.1 g/bhp-hr	0.65	0.65	~~0.05~~ 0.03
NMHC (*as VOC*) 1.12 g/bhp-hr	~~0.035~~ 0.04	~~0.035~~ 0.04	0.002
CO 3.0 g/bhp-hr	~~0.43~~ 0.57	~~0.43~~ 0.57	~~0.02~~ 0.03
SOx (as SO2) 3.67 * wt%S g/bhp-hr	0.0015	0.0015	~~7.5E-05~~ 6.3E-05

hint: 454 grams = 1 pound

[*] *Based on 30-minute per hour operating time.*

[†] *Values reflect 50 hours per year of maintenance and testing operations.*

RECEPTOR INFORMATION (a receptor is any location outside the boundaries of a facility where a person may be exposed to diesel exhaust due to operation of the engine.)

Nearest receptor description (receptor type):______________*See Section 5.9 of AFC*_________________

Distance to nearest receptor (feet):_____________________*See Section 5.9 of AFC* ________________

Distance to the nearest school (feet):_____________________*>6 miles*______________________________

AB2588 INVENTORY

Is this engine included in an existing AB2588 inventory (yes or no):______________*No*____________

Theodore Schade
Control Officer

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

157 Short Street * Bishop, California 93514 * (760) 872-8211 * Fax (760) 872-6109

Section A-6 Diesel Fired ICE Permit Application pursuant to Health & Safety Code ' 93115 (e)(4)(A)3.

ENGINE INFORMATION : (use a separate form for each engine) *FP1C*

Engine Manufacturer:_____*Cummins*_ or equivalent ____________________ __________________

Model Name:__~~*CFP9E-F20*~~_*CFP7E-F30* or equivalent____

EPA 12-Character Family Name:__~~*ACEXL0540AAB*~~ *ACEXL0409AAB (Tier 3*)___________________

Serial Number:__________*TBD*____

Year of Manufacture:______*2013 (assumed year of purchase)*__________________________________

Maximum Rated Brake Horsepower (bhp):__*200*__~~*233*~~____

Stack Height from Ground (feet):_*15*__~~*14*~~_________, Exhaust Stack Diameter (inches):_____4________

Direction of Stack (horz.or vert):________*vert*________, End of Stack (open or capped):______*open*________

Physical Location of the Engine
(address or UTM coordinates):_________*N 3,984,072.664 / E 598,629.814*_________________________

OPERATIONAL INFORMATION

Describe the General Use of the Engine: *emergency fire water pump*

Typical Load (percent of maximum bhp rating): *100%*

Typical annual hours of operation: *50*

If seasonal, months of year operated: *Not Applicable*

If seasonal, typical hours per month operated: *Not Applicable*

Fuel usage rate (if available) gallons/hour: *12.0* ~~*14.0*~~

Maximum operating schedule: Hourly *0.5*, Daily *0.5*, Quarterly *12.5*, Yearly *50*,

Fuel used (circle one): [✓ CARB Diesel], Jet fuel, Diesel, Alternative diesel fuel (specify), Alternative fuel (specify), Combination (Dual fuel)(specify), Other (specify):________________________________

EXHAUST CONTROL TECHNOLOGY

Pollution Control Equipment (circle): [✓ Turbo Charger], Aftercooler, Catalyst, Injection Timing Retarding, Diesel Particulate Filter, Other: *None*

Is the engine equipped with an exhaust after-treatment system (e.g., a particulate filter, catalyst), or other modification to the engine to reduce exhaust emissions? If yes, please provide the name of the manufacturer, model, and the CARB executive order number. Please attach a photocopy of the manufacturers= product literature: *Not Applicable*

If a Diesel Particulate Filter (DPF) is used, identify the type of back pressure monitor that will be installed. Attach a copy of the manufacturers= literature.
Manufacturer: *Not Applicable*, Model Name: *Not Applicable*

Serial Number: *Not Applicable*, Pressure & Temperature Range: *Not Applicable*

EMISSION FACTORS

Emission factors form the basis for calculating the mass emissions from the engine. The District will use default emission factors based on the engine=s EPA Tier standard. Older engines are assigned the current EPA AP-42 emission factors. If another reference measure is selected, provide the specific basis and attach detailed supporting documentation. *See attachment*

AP-42 emission factors	Lbs/hr[*]	Lbs/day	Tons/year[†]
PM_{10} 1.0 g/bhp-hr	0.033	0.033	0.002
NOx (as NO2) 14.1 g/bhp-hr	~~0.55~~ 0.7	~~0.55~~ 0.7	0.03
NMHC (*as VOC*) 1.12 g/bhp-hr	~~0.03~~ 0.04	~~0.03~~ 0.04	0.002
CO 3.0 g/bhp-hr	~~0.37~~ 0.6	~~0.37~~ 0.6	0.02
SOx (as SO2) 3.67 * wt%S g/bhp-hr	0.0015	0.0015	6.3E-05

hint: 454 grams = 1 pound

[*] *Based on 30-minute per hour operating time.*

[†] *Values reflect 50 hours per year of maintenance and testing operations.*

RECEPTOR INFORMATION (a receptor is any location outside the boundaries of a facility where a person may be exposed to diesel exhaust due to operation of the engine.)

Nearest receptor description (receptor type): *See Section 5.9 of AFC*

Distance to nearest receptor (feet): *See Section 5.9 of AFC*

Distance to the nearest school (feet): *>6 miles*

AB2588 INVENTORY

Is this engine included in an existing AB2588 inventory (yes or no): *No*

AFC Section 5.1, Air Quality
(Revised April 2012)

5.1 Air Quality

5.1.1 Introduction

The Hidden Hills Solar Electric Generating System (HHSEGS) will be located on privately owned land in Inyo County, California, adjacent to the Nevada border. It will comprise two solar fields and associated facilities: the northern solar plant (Solar Plant 1) and the southern solar plant (Solar Plant 2). Each solar plant will generate 270 megawatts (MW) gross (250 MW net), for a total net output of 500 MW. Solar Plant 1 will occupy approximately 1,483 acres (or 2.3 square miles), and Solar Plant 2 will occupy approximately 1,510 acres (or 2.4 square miles). A 103-acre common area will be established on the southeastern corner of the site to accommodate an administration, warehouse, and maintenance complex, and an onsite switchyard. A temporary construction laydown and parking area on the west side of the site will occupy approximately 180 acres.

Each solar plant will use heliostats—elevated mirrors guided by a tracking system mounted on a pylon—to focus the sun's rays on a solar receiver steam generator (SRSG) atop a tower near the center of each solar field. The solar power tower technology for the HHSEGS project design incorporates an important technology advancement, the 750-foot-tall solar power tower. One principle advantage of the HHSEGS solar power tower design is that it results in more efficient land use and greater power generation. The new, higher, 750-foot solar power tower allows the heliostat rows to be placed closer together, with the mirrors at a steeper angle. This substantially reduces mirror shading and allows more heliostats to be placed per acre. More megawatts can be generated per acre and the design is more efficient overall.

In each solar plant, one Rankine-cycle steam turbine will receive steam from the SRSG (or solar boiler to) generate electricity. The solar field and power generation equipment will start each morning after sunrise and, unless augmented, will shut down when insolation drops below the level required to keep the turbine online. Each solar plant will include a natural-gas-fired auxiliary boiler, used to pre-warm the SRSG to minimize the amount of time required for startup each morning, to assist during shutdown cooling operation, and to augment the solar operation when solar energy diminishes, as well as a nighttime preservation boiler, used to maintain system temperatures overnight. On an annual basis, heat input from natural gas will be limited by fuel use and other conditions to less than 10 percent of the heat input from the sun.

Deleted: or during transient cloudy conditions, as well as a startup boiler, used during the morning startup cycle, and

To save water in the site's desert environment, each solar plant will use a dry-cooling condenser. Cooling will be provided by air-cooled condensers, supplemented by a partial dry-cooling system for auxiliary equipment cooling. Raw water will be drawn daily from onsite wells located in each power block and at the administration complex. Groundwater will be treated in an onsite treatment system for use as boiler make-up water and to wash the heliostats.

Two distinct transmission options are being considered because of a unique situation concerning Valley Electric Association (VEA). Under the first option, the project would interconnect via a 230-kilovolt (kV) transmission line to a new VEA-owned substation (Tap Substation) at the intersection of Tecopa Road[1] and Nevada State Route (SR) 160 (the

---

[1] The road is also called Tecopa Highway and Old Spanish Trail Highway. The names are generally used interchangeably.

Tecopa/SR- 160 Option). The other option is a 500-kV transmission line that interconnects to the electric grid at the Eldorado Substation (the Eldorado Option), in Boulder City, Nevada.

A 12- to 16-inch-diameter natural gas pipeline will be required for the project. It will exit the HHSEGS site at the California-Nevada border and travel on the Nevada side southeast along the state line, then northeast along Tecopa Road until it crosses under SR 160. From this location a 36 inch line will turn southeast and continue approximately 26 miles, following the proposed Eldorado Option transmission line corridor, to intersect with the Kern River Gas Transmission (KRGT) pipeline. A tap station will be constructed at that point to connect it to the KRGT line. The total length of the natural gas pipeline will be approximately 35.3 miles.

The transmission and natural gas pipeline alignments will be located in Nevada, primarily on federal land managed by the U.S. Bureau of Land Management (BLM), except for small segments of the transmission line (both options) in the vicinity of the Eldorado Substation, which is located within the city limits of Boulder City, Nevada. A detailed environmental impact analysis of the transmission and natural gas pipeline alignments will be prepared by BLM.

HHSEGS will include 4 natural-gas-fired boilers, ranging in size from 15 to 249 million British thermal units per hour (MMBtu/hr). Each of the two power blocks will include one 249-MMBtu/hr natural-gas-fired auxiliary boiler that will be used during the morning startup cycle to assist the plant in coming up to operating temperature more quickly, to assist the SRSG during shutdown cooling, and to augment the solar operation when solar energy diminishes. Each solar plant will also have one small 15 MMBtu/hr nighttime preservation boiler to maintain system temperatures overnight. Additional emitting units at each plant include emergency diesel generators, diesel fire pump engines, and small wet-surface air coolers.

Deleted: 10

Deleted: 12

Deleted: 500

Deleted: three 500 MMBTU/hr natural-gas-fired auxiliary boilers that will be used to augment the solar operation when solar energy diminishes or during transient cloudy conditions. The auxiliary boilers may also be used to extend daily power generation. However, on an annual basis heat input from natural gas will be limited by fuel use and other conditions to less than 10 percent of the heat input from the sun. Each power block will also include

Deleted: startup

Deleted: Additionally, e

Deleted: 2

Deleted: an

Deleted: a

Deleted: a

HHSEGS will not be a major stationary source under Great Basin Unified Air Pollution Control District (GBUAPCD) New Source Review (NSR) regulations because maximum facility emissions of each criteria pollutant will be below 250 pounds per day. The project will not be a major source under the federal Prevention of Significant Deterioration (PSD) program because its potential emissions will be than 100 tons per year (tpy) of each PSD criteria pollutant, and less than 100,000 tons per year of greenhouse gases (GHG).

This section describes existing air quality conditions; maximum potential impacts from the project; compliance with applicable laws, ordinances, regulations and standards (LORS); and mitigation measures that will keep maximum project impacts below applicable thresholds of significance. The methodology and results of the air quality analysis used to assess potential impacts are also presented. The analysis has been conducted according to the California Energy Commission (CEC) power plant siting requirements and also addresses GBUAPCD air permitting requirements.

HHSEGS will use the latest, most efficient generation technology to generate electricity in a manner that will minimize the amount of fuel needed, emissions of criteria pollutants, and potential effects on ambient air quality. Other beneficial environmental aspects of the project that avoid or minimize air quality impacts include the following:

- Use of solar technology to generate electricity with minimal use of fossil fuel

- Use of clean-burning natural gas for support equipment
- Low-sulfur content of the natural gas, which reduces sulfur dioxide (SO_2) emissions and subsequent sulfate fine particulate generation
- Optimized stack heights to reduce ground-level concentrations of exhaust pollutants below public health-related significance thresholds

Details of the air quality assessment of the project are contained in the following subsections:

- Section 5.1.2, Laws, Ordinances, Regulations, and Standards, describes applicable LORS pertaining to air quality aspects of the project. This section includes minor changes to reflect the changes in applicable LORS due to the elimination of the largest boilers from the project design.
- Section 5.1.3, Affected Environment, describes the local environment surrounding the project site, including topography, climate, and existing air quality. The most representative meteorological data—including wind speed and direction, temperature, relative humidity, and precipitation—and the most representative recent ambient concentration measurements for criteria air pollutants are summarized. There are no changes to this section.
- Section 5.1.4, Environmental Analysis, evaluates the maximum potential air quality impacts due to the project's emissions of nitrogen oxides (NOx), carbon monoxide (CO), sulfur oxides (SOx), volatile organic compounds (VOCs), particulate matter less than 10 microns in diameter (PM_{10}), and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). Emission estimates for these pollutants are presented for the construction phase of the project, as well as for operation of the installed equipment over a full range of operating modes, including commissioning, startups and shutdowns, maintenance activities, and normal operation with operable pollution control systems. A dispersion modeling analysis for nitrogen dioxide (NO_2), CO, SO_2, PM_{10}, and $PM_{2.5}$ is presented; the results show that the project would not cause or significantly contribute to exceedances of the California Ambient Air Quality Standards (CAAQS) or National Ambient Air Quality Standards (NAAQS). Emissions of GHGs from the project are also described. This section includes new emissions calculations and ambient air quality impact analyses reflecting the boiler optimization.
- Section 5.1.5, Cumulative Air Quality Impacts, addresses the cumulative impacts of project emissions with other potential new sources of air pollution in the area around the project. There are minor changes to this section that incorporate information previously submitted in data responses; however, no substantive changes have been made to this section.
- Section 5.1.6, Consistency with Laws, Ordinances, Regulations, and Standards, describes how the project will comply with applicable LORS pertaining to air quality aspects of the project. This section has been revised to reflect the boiler optimization project changes.

- Section 5.1.7, Mitigation Measures, describes mitigation for project air quality impacts. There are minor changes to this section that reflect the revised, lower emissions from the revised project.
- Section 5.1.8, Involved Agencies and Agency Contacts, lists the agency personnel contacted during preparation of the air quality assessment. There are no changes to this section.
- Section 5.1.9, Permits Required and Permit Schedule, lists the air quality permits required for the project and provides a permit schedule for the project. No changes have been made to this section.
- Section 5.1.10, References, lists the references used to conduct the air quality assessment. No changes have been made to this section.

Additional air quality data are presented in other sections of this Application for Certification (AFC), including an evaluation of toxic air pollutants (see Section 5.9, Public Health) and information relating to the fuel characteristics, heat rate, and startup and operating limits of HHSEGS (see Section 2.0, Project Description).

5.1.2 Laws, Ordinances, Regulations, and Standards

Each level of government—federal, state, and local—has adopted specific regulations that regulate emissions from stationary sources, several of which are applicable to this project. Each of these regulatory programs is discussed in the following sections.

5.1.2.1 Federal LORS

The U.S. Environmental Protection Agency (EPA) implements and enforces the requirements of many of the federal environmental laws. The federal Clean Air Act, as most recently amended in 1990, provides EPA with the legal authority to regulate air pollution from stationary sources such as the project. EPA has promulgated the following stationary source regulatory programs to implement the requirements of the 1990 Clean Air Act:

- Prevention of Significant Deterioration
- New Source Review
- Standards of Performance for New Stationary Sources (NSPS)
- National Emission Standards for Hazardous Air Pollutants (NESHAPS)
- Title IV: Acid Deposition Control
- Title V: Operating Permits

5.1.2.1.1 Prevention of Significant Deterioration Program

Authority: Clean Air Act §160-169A, 42 USC §7470-7491; 40 CFR Parts 51 and 52

Requirements: Requires preconstruction review and permitting of new or modified major stationary sources of air pollution to prevent significant deterioration of ambient air quality. PSD applies to pollutants for which ambient concentrations do not exceed the corresponding NAAQS (i.e., attainment pollutants). The PSD program allows new sources of air pollution to be constructed, or existing sources to be modified, while preserving the existing ambient air quality levels, protecting public health and welfare, and protecting Class I areas (e.g., national parks and wilderness areas).

The PSD requirements apply to any project that is a new major stationary source or a major modification to an existing major stationary source. A major source is a listed facility (one of 28 PSD source categories listed in the federal Clean Air Act) that emits at least 100 tpy of any criteria pollutant, or any other facility that emits at least 250 tpy. Effective July 1, 2011, a stationary source that emits both more than 100,000 tpy of GHGs and more than 100 tpy of any individual GHG, is also considered to be a major stationary source. A major modification is any project at a major stationary source that results in a significant increase in emissions of any PSD pollutant. A PSD pollutant is a criteria pollutant for which the area is in attainment with the NAAQS.

A significant increase for a PSD pollutant is an increase above the significant emission rate for that pollutant (Table 5.1-1). It is important to note that, once PSD is triggered by any pollutant, PSD requirements apply to any PSD pollutant with an emission increase above the significance level, regardless of whether the facility is major for that pollutant.

Deleted: Table 5.1-1

TABLE 5.1-1
PSD Significant Emission Thresholds

Pollutant	PSD Significant Emission Threshold (tpy)[a]
NOx	40
SO_2	40
CO	100
VOC	40
PM_{10}	15
$PM_{2.5}$	10
Lead	0.6
GHG[b]	75,000

[a] 40 CFR 52.21 (b)(1)(23).

[b] PSD/Title V GHG Tailoring Rule, June 3, 2010.

The principal requirements for the PSD program include those outlined below.

- Pre- and/or post-construction air quality monitoring may be required.
- Emissions of the PSD pollutants that are subject to PSD review must be controlled using best available control technology (BACT).
- Air quality impacts in combination with other increment-consuming sources must not exceed maximum allowable incremental increases. Air quality impacts of all sources in the area plus ambient pollutant background levels cannot exceed NAAQS.

- The air quality impacts nearby PSD Class I areas (specific national parks and wilderness areas) must be evaluated.
- The air quality impacts on growth, visibility, soils and vegetation must be evaluated.

Air Quality Monitoring

At its discretion, EPA may require preconstruction and/or post-construction ambient air quality monitoring for PSD sources if representative monitoring data are not already available. Preconstruction monitoring data must be gathered over a one-year period to characterize local ambient air quality. Post-construction air quality monitoring data must be collected as deemed necessary by EPA to characterize the impacts of proposed project emissions on ambient air quality.

Best Available Control Technology

BACT must be applied to any new or modified major source to minimize the emissions increase of those pollutants exceeding the PSD emission thresholds. EPA defines BACT as an emissions limitation based on the maximum degree of reduction for each subject pollutant—considering energy, environmental, and economic impacts—that is achievable through the application of available methods, systems, and techniques. BACT must be as stringent as any emission limit required by an applicable NSPS or NESHAP.

Air Quality Impact Analysis

An air quality dispersion analysis must be conducted to evaluate impacts of significant emission increases from new or modified facilities on ambient air quality. PSD source emissions must not cause or contribute to an exceedance of any ambient air quality standard, and the increase in ambient air concentrations must not exceed the allowable increments shown in Table 5.1-2. Once PSD review is triggered for a project, all pollutants with emission increases above the PSD significance thresholds are subject to this requirement.

Deleted: Table 5.1-2

TABLE 5.1-2
PSD Increments and Significant Impact Levels

Pollutant	Averaging Time	SILs (µg/m^3)^a	Maximum Allowable Class II Increments^b
NO_2	Annual 1-hr	1.0 7.53^c	25 No 1-hr increment
SO_2	Annual 24-hr 3-hr 1-hr	1.0 5 25 7.83^c	20 91 512 No 1-hr increment
CO	8-hr 1-hr	500 2,000	No CO increments
PM_{10}	Annual 24-hr	1.0 5	17 30
$PM_{2.5}$	Annual 24-hr	0.3 1.2	4 9

[a] 40 CFR 51.165 (b)(2).

[b] 40 CFR 52.21 (c)

[c] EPA has not yet defined significance impact levels (SILs) for one-hour NO_2 or SO_2 impacts. However, EPA has

TABLE 5.1-2
PSD Increments and Significant Impact Levels

Pollutant	Averaging Time	SILs ($\mu g/m^3$)[a]	Maximum Allowable Class II Increments[b]

suggested that, until SILs have been promulgated, interim values of 4 ppb (7.53 $\mu g/m^3$) for NO_2 and 3 ppb (7.83 $\mu g/m^3$) for SO_2 may be used. These values will be used in this analysis wherever a SIL would be used for NO_2 or SO_2.

$\mu g/m^3$ = micrograms per cubic meter

Protection of Class I Areas

The potential increase in ambient air quality concentrations for attainment pollutants within Class I areas closer than approximately 100 km may need to be quantified if the new or modified PSD source were to have a sufficiently large emission increase as evaluated by the Class I area Federal Land Managers. In such a case, a Class I visibility impact analysis would also be performed.

Growth, Visibility, Soils, and Vegetation Impacts

Impairment to visibility, soils, and vegetation resulting from PSD source emissions as well as associated commercial, residential, industrial, and other growth must be analyzed. This analysis includes cumulative impacts to local ambient air quality.

Administering Agency: EPA.

5.1.2.1.2 Nonattainment New Source Review

Authority: Clean Air Act §171-193, 42 USC §7501 et seq.; 40 CFR Parts 51 and 52

Requirement: Requires preconstruction review and permitting of new or modified major stationary sources of air pollution to allow industrial growth without interfering with the attainment and maintenance of ambient quality standards. In general, this program is implemented at the local level with EPA oversight.

- Emissions must be controlled to the lowest achievable emission rate (LAER).
- Sufficient offsetting emissions reductions must be obtained following the requirements in the regulations to continue reasonable further progress toward attainment of applicable NAAQS.
- The owner or operator of the new facility must confirm that major stationary sources owned or operated by the same entity in California are in compliance or on schedule for compliance with applicable emissions limitations in this rule.
- The administrator must find that the implementation plan has been adequately implemented.
- An analysis of alternatives must show that the benefits of the proposed source significantly outweigh any environmental and social costs.

Nonattainment new source review jurisdiction has been delegated to the GBUAPCD for all pollutants and is discussed further under local LORS section below.

Administering Agency: GBUAPCD, with EPA oversight.

5.1.2.1.3 New Source Performance Standards

Authority: Clean Air Act §111, 42 USC §7411; 40 CFR Part 60

Requirements: Establishes national standards of performance to limit the emissions of criteria pollutants (air pollutants for which EPA has established NAAQS) from new or reconstructed facilities in specific source categories. Applicability of these regulations depends on equipment size, process rate, and date of construction. HHSEGS will be subject to the following NSPS:

Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units

The requirements of Subpart Db, Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units, are applicable to the startup boilers. For natural-gas-fired units, Subpart Db includes the following emission limits:

- NOx: 0.20 lb/MMBtu (24-hour average basis)
- SO_2: 0.20 lb/MMBtu

Deleted: *<#>Standards of Performance for Electric Utility Steam Generating Units¶*
The requirements of Subpart Da, Standards of Performance for Electric Utility Steam Generating Units, are applicable to the auxiliary boilers. For natural-gas-fired units, Subpart Da includes the following emission limits:¶
<#>NOx: 0.20 lb/MMBtu (30-day average) ¶
<#>SO_2: 1.4 lb/MWh (30-day average)¶
<#>PM: 0.015 lb/MMBtu ¶

Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

The requirements of Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, are applicable to the nighttime preservation boilers. For these small natural-gas-fired units, Subpart Dc includes the following emission limit:

- SO_2: 0.5 lb/MMBtu

The PM limits of Subpart Dc do not apply to boilers with a heat input capacity below 30 MMBtu/hr, such as the nighttime preservation boilers.

Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, will be applicable to the emergency engines and the fire pump engines. Further discussion of the applicability of these regulations is included in the Section 5.1.6.

All of these standards are enforced at the local level with federal and state oversight.

Administering Agency: GBUAPCD, with EPA and California Air Resources Board oversight.

5.1.2.1.4 National Emission Standards for Hazardous Air Pollutants

Authority: Clean Air Act §112, 42 USC §7412

Requirements: Establishes national emission standards to limit emissions of hazardous air pollutants (HAPs, or air pollutants identified by EPA as causing or contributing to the adverse health effects of air pollution but for which NAAQS have not been established) from facilities in specific source categories. These standards are implemented at the local level with federal oversight.

National Emission Standards for Reciprocating Internal Combustion Engines

The requirements of 40 CFR 63 Subpart ZZZZ (National Emission Standards for Reciprocating Internal Combustion Engines) will apply to the emergency compression-ignition engines that are part of the project. For emergency engines in this size range, compliance with the requirements of Subpart ZZZZ is achieved by purchasing engines that comply with the applicable NSPS (40 CFR 60 Subpart IIII).

National Emission Standards for Area Sources: Industrial/ Commercial/Institutional Boilers
40 CFR 63 Subpart JJJJJJ (National Emission Standards for Area Sources: Industrial/ Commercial/Institutional Boilers) does not include requirements for natural-gas-fired boilers, so this regulation will not apply to the any of the boilers at HHSEGS.

Administering Agency: GBUAPCD, with EPA oversight.

5.1.2.1.5 Acid Rain Program

Authority: Clean Air Act §401 (Title IV), 42 USC §7651

Requirement: Requires the monitoring and reporting of emissions of acidic compounds and their precursors from combustion power generating equipment larger than 25 MW. The principal source of these compounds is the combustion of fossil fuels. Therefore, Title IV established national standards to monitor, record, and, in some cases, limit SO_2 and NOx emissions from electrical power generating facilities. These standards are implemented at the local level with federal oversight. GBUAPCD has not received delegation authority to implement Title IV.

Administering Agency: EPA

Deleted: GBUAPCD, with

Deleted: oversight

5.1.2.1.6 Title V Operating Permits Program

Authority: Clean Air Act §501 (Title V), 42 USC §7661

Requirements: Requires the issuance of operating permits that identify all applicable federal performance, operating, monitoring, recordkeeping, and reporting requirements. Title V applies to major facilities, Phase II acid rain facilities, subject solid waste incinerator facilities, and any facility listed by EPA as requiring a Title V permit. GBUAPCD has received delegation authority for this program.

Administering Agency: GBUAPCD, with EPA oversight.

5.1.2.2 State LORS: California

The California Air Resources Board (CARB) was created in 1968 by the Mulford-Carrell Air Resources Act, through the merger of two other state agencies. CARB's primary responsibilities are to develop, adopt, implement, and enforce the state's motor vehicle pollution control program; to administer and coordinate the state's air pollution research program; to adopt and update, as necessary, the state's ambient air quality standards; to review the operations of the local air pollution control districts; and to review and coordinate preparation of the SIP for achievement of the federal ambient air quality standards. CARB has implemented the following state or federal stationary source regulatory programs in accordance with the requirements of the federal Clean Air Act and California Health & Safety Code (H&SC):

- State Implementation Plan
- California Clean Air Act
- Nuisance Regulation
- Toxic Air Contaminant Program
- Air Toxics "Hot Spots" Act
- CEC and CARB Memorandum of Understanding
- California Climate Change Regulatory Program

5.1.2.2.1 State Implementation Plan

Authority: H&SC §39500 et seq.

Requirements: Required by the federal Clean Air Act, the SIP must demonstrate the means by which all areas of the state will attain and maintain NAAQS within the federally mandated deadlines. CARB reviews and coordinates preparation of the SIP. Local districts must adopt new rules (and/or revise existing rules) and demonstrate that the resulting emission reductions, in conjunction with reductions in mobile source emissions, will result in the attainment of NAAQS. The relevant GBUAPCD Rules and Regulations that have also been incorporated into the SIP are discussed with the local LORS.

Administering Agency: GBUAPCD, with CARB and EPA oversight.

5.1.2.2.2 California Clean Air Act

Authority: H&SC §40910 − 40930

Requirements: Established in 1989, the California Clean Air Act requires local districts to attain and maintain both national and state ambient air quality standards at the "earliest practicable date." Local districts must prepare air quality plans demonstrating the means by which the ambient air quality standards will be attained and maintained.

Administering Agency: GBUAPCD, with CARB oversight.

5.1.2.2.3 Nuisance Regulation

Authority: H&SC §41700

Requirements: Provides that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes 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."

Administering Agency: GBUAPCD and CARB

5.1.2.2.4 Toxic Air Contaminant Program

Authority: H&SC §39650 − 39675

Requirements: Established in 1983, the Toxic Air Contaminant Identification and Control Act created a two-step process to identify toxic air contaminants and control their emissions. CARB identifies and prioritizes the pollutants to be considered for identification as toxic air contaminants, and also assesses the potential for human exposure to a substance; the Office of Environmental Health Hazard Assessment (OEHHA) evaluates the corresponding health effects. Both agencies collaborate in the preparation of a risk assessment report, which concludes whether a substance poses a significant health risk and should be identified as a toxic air contaminant. In 1993, the Legislature amended the program to identify the 187 federal hazardous air pollutants as toxic air contaminants. CARB reviews the emission sources of an identified toxic air contaminant and, if necessary, develops air toxics control measures to reduce the emissions.

Administering Agency: GBUAPCD and CARB

5.1.2.2.5 Air Toxic "Hot Spots" Act

Authority: H& SC §44300-44384; 17 California Code of Regulations (CCR) §93300-93347

Requirements: Established in 1987, the Air Toxics "Hot Spots" Information and Assessment Act (also known as AB 2588) supplements the toxic air contaminant program, by requiring the development of a statewide inventory of air toxics emissions from stationary sources. The program requires affected facilities to prepare (1) an emissions inventory plan that identifies relevant air toxics and sources of air toxics emissions; (2) an emissions inventory report quantifying air toxics emissions; and (3) a health risk assessment, if necessary, to characterize the health risks to the exposed public. Facilities whose air toxics emissions are deemed to pose a significant health risk must issue notices to the exposed population. In 1992, the Legislature amended the program to further require facilities whose air toxics emissions are deemed to pose a significant health risk to implement risk management plans to reduce the associated health risks. This program is implemented at the local level with state oversight.

Administering Agency: GBUAPCD and CARB

5.1.2.2.6 CEC and CARB Memorandum of Understanding

Authority: CA Pub. Res. Code §25523(a); 20 CCR §1752, 1752.5, 2300-2309 and Div. 2, Chap. 5, Appendix B, Part (g)(8)(K)

Requirements: Provides for the inclusion of air district permit requirements in the CEC's decision on an application for certification to assure protection of environmental quality. The AFC is required to include information concerning air quality protection.

Administering Agency: CEC

5.1.2.2.7 California Climate Change Regulatory Program

Authority: Stats. 2006, Ch. 488 and H&SC § 38500-38599

Requirements: The State of California adopted the Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32) on September 27, 2006, which requires sources within the state to reduce carbon emissions to 1990 levels by the year 2020.

AB 32 set the following milestone dates for CARB to take specific actions:

- June 30, 2007: Identify a list of discrete early action GHG emission reduction measures (first report published April 20, 2007, with additional measures adopted on October 25, 2007).
- January 1, 2008: Establish a statewide GHG emission cap for 2020 that is equivalent to 1990 emissions.
- January 1, 2008: Adopt mandatory reporting rules for significant sources of GHGs.
- January 1, 2009: Adopt a scoping plan that will indicate how GHG emission reductions will be achieved from significant GHG sources through regulations, market-based compliance mechanisms, and other actions, including recommendation of a de minimis threshold for GHG emissions, below which sources would be exempt from reduction requirements.
- January 1, 2011: Adopt regulations to achieve maximum technologically feasible and cost-effective GHG emission reductions, including provisions for both market-based and alternative compliance mechanisms.

- January 1, 2012: Regulations adopted prior to January 1, 2010, become effective.

Specific actions taken by CARB that relate to power plants and other industrial facilities include the establishment of GHG monitoring and reporting requirements, and the adoption of a cap-and-trade program for GHG emissions. The latter program is currently undergoing legal challenge.

On January 25, 2007, the PUC and CEC jointly adopted an interim Greenhouse Gas Emissions Performance Standard (EPS) in an effort to help mitigate the effects of climate change. The EPS is a facility-based emissions standard requiring that all new long-term commitments for base load generation to serve California consumers be with power plants that have emissions no greater than a combined-cycle gas turbine plant. That level is established at 1,100 pounds of CO_2 per megawatt-hour.

The AFC is required to include the project's emission rates of greenhouse gases (CO_2, CH_4, N_2O, and SF_6) from combustion sources, cooling towers, fuels and materials handling processes, delivery and storage systems, and from all onsite secondary emission sources. The required information is presented below.

Administering Agencies: CARB, PUC and CEC.

5.1.2.3 Local LORS

When the state's air pollution statutes were reorganized in the mid-1960s, local air pollution control districts (APCDs) were required to be established in each county of the state (H&SC §4000 et seq.). There are three different types of districts: county, regional, and unified. In addition, special air quality management districts (AQMDs), with more comprehensive authority over non-vehicular sources as well as transportation and other regional planning responsibilities, have been established by the Legislature for several regions in California, (H&SC §40200 et seq.).

Air pollution control districts and air quality management districts in California have principal responsibility for:

- Developing plans for meeting the state and federal ambient air quality standards;
- Developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain both state and federal air quality standards;
- Implementing permit programs established for the construction, modification, and operation of sources of air pollution; and
- Enforcing air pollution statutes and regulations governing non-vehicular sources, and for developing employer-based trip reduction programs.

5.1.2.3.1 Great Basin Unified Air Pollution Control District Rules and Regulations

Authority: CA Health & Safety Code §40001

Requirements: Prohibit emissions and other discharges (such as smoke and odors) from specific sources of air pollution in excess of specified levels.

Administering Agency: GBUAPCD, with CARB oversight.

Permits Required

Under Regulation II, Rule 200 (Permits Required) and Rule 209-A, section E (Power Plants), GBUAPCD administers the air quality regulatory program for the construction, alteration, replacement, and operation of new power plants. As part of the AFC process, the project will be required to obtain a preconstruction Determination of Compliance (DOC) from the GBUAPCD. Regulation II, Rule 200 incorporates other GBUAPCD rules that govern how sources may emit air contaminants through the issuance of air permits (i.e., Authority to Construct [ATC] and Permit to Operate [PTO]). This permitting process allows the GBUAPCD to review new and modified air pollution sources to ensure compliance with all applicable prohibitory rules and to ensure that appropriate emission controls are used. Projects that are reviewed under the CEC AFC process must obtain a final DOC (FDOC) from the local air district prior to construction of the new power plant. Upon approval of the AFC by the CEC with conditions incorporating the requirements of the FDOC, the FDOC will confer upon the applicant all of the rights and privileges of an ATC. Once the project commences operations and demonstrates compliance with the ATC, GBUAPCD will issue a PTO. The PTO specifies conditions that the facility must meet to comply with all applicable air quality rules, regulations, and standards.

An application for a Determination of Compliance will be filed with GBUAPCD at approximately the same time as the AFC is filed with the CEC.

New Source Review Requirements

There are three basic requirements within the NSR rules. First, BACT and/or LAER requirements must be applied to any new source with potential emissions above specified threshold quantities. Second, all potential emission increases of nonattainment pollutants or precursors from the proposed source above specified thresholds must be offset by real, quantifiable, surplus, permanent, and enforceable emission decreases in the form of ERCs. Third, an ambient air quality impact analysis must be conducted to confirm that the project does not cause or contribute to a violation of a national or California AAQS or jeopardize public health.

The first two of these three NSR provisions (BACT and emission offset requirements) are included in GBUAPCD’s Regulation II, Rule 209-A, section D. The third NSR provision (to confirm via a modeling analysis that the project does not cause or contribute to a violation of applicable air quality or public health standards) is included in Regulation II, Rule 216.

New Source Review Requirements for Air Toxics

The GBUAPCD’s NSR rule for air toxics (Regulation II, Rule 220, Construction or Reconstruction of Major Sources of Hazardous Air Pollutants) describes the requirements, procedures, and standards for evaluating the potential impact of toxic air contaminants (TACs) from new sources and modifications to existing sources.

New Source Performance Standards

The GBUAPCD’s New Source Performance Standards (Regulation IX, New Source Performance Standards) incorporate the federal NSPS from 40 CFR Part 60. The applicability and requirements of the New Source Performance Standards are discussed above under the federal regulations section.

Federal Programs and Permits

The federal Title IV acid rain program requirement and Title V operational permit requirements are in GBUAPCD's Rule 217 (Additional Procedures for Issuing Permits to Operate for Sources Subject to Title V of the Federal Clean Air Act Amendments of 1990). The applicability and requirements of these programs and permits are discussed above under the federal regulations section.

Public Notification

If project emissions exceed the air quality impact assessment (AQIA) trigger levels, public notice under Rule 209-A is required. The Applicant expects that the GBUAPCD Air Pollution Control Officer will provide this notice in a timely manner. The AQIA trigger levels for new sources are 15 pounds per hour or 150 pounds per day of NOx, VOC, SOx, PM_{10} or $PM_{2.5}$, and 150 pounds per hour or 1,500 pounds per day of CO.

Permit Fees

The GBUAPCD requirements regarding permit fees are specified in Regulation III. This regulation establishes the filing and permit review fees for specific types of new sources, as well as annual renewal fees and penalty fees for existing sources.

Prohibitions

The GBUAPCD prohibitions for specific types of sources and pollutants are addressed in Regulation IV. The prohibitory rules that potentially apply to the project are listed below.

Rule 400 – Visible Emissions: This rule prohibits any source from discharging emissions of any air contaminant that is darker in shade than that designated as Number 1 on the Ringelmann Chart for a period or periods aggregating more than 3 minutes in any period of 60 consecutive minutes.

Rule 401 – Fugitive Dust: This rule requires that reasonable precautions be taken to prevent visible particulate matter from being airborne. Examples of reasonable precautions include proper roadway maintenance; the use (where practical) of hoods, fans, and filters; and the use of water or chemicals to control dust from demolition, construction, road grading, or clearing of land.

Rule 402 – Nuisance: This rule prohibits the discharge from a facility of air contaminants that cause injury, detriment, nuisance, or annoyance to the public, or cause damage to business or property.

Rule 404-A – Particulate Matter Emission Standards: This rule prohibits the discharge from any source of particulate matter in excess of 0.30 grain per dry standard cubic foot (0.67 grams per dry standard cubic meter) of gas.

Rule 404-B – Oxides of Nitrogen: This rule applies to fuel-burning equipment with a maximum heat input rate in excess of 1.5 billion Btu/hr (gross) (1500 MMBtu/hr HHV). All of the fuel burning equipment proposed for installation at HHSEGS has a maximum heat input rate below this threshold, so this rule is not applicable to the project.

Rule 416 – Sulfur Compounds and Nitrogen Oxides: This rule prohibits emissions from a single source in excess of the following:

- Sulfur compounds as SO_2: 0.2% by volume
- NOx, calculated as NO_2: 140 lb/hr from any new boiler

All applicable LORS are summarized in Table 5.1-3R.

Deleted: **<#>Inyo County Renewable Energy Ordinance¶**
For projects not subject to the CEC's exclusive jurisdiction, the Inyo County Renewable Energy Ordinance requires developers of renewable energy projects to apply for and obtain from the County Planning Commission a renewable energy impact determination that identifies environmental and other impacts expected to result from such project and mitigation for those impacts. The identification of potential air quality impacts and mitigation required by the Renewable Energy Ordinance is provided in this AFC. ¶

Deleted: Table 5.1-

TABLE 5.1-3R
Laws, Ordinances, Regulations, and Standards Applicable to Air Quality

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	AFC Section Explaining Conformance
Federal					
Clean Air Act (CAA) §160-169A and implementing regulations, Title 42 United States Code (USC) §7470-7491 (42 USC 7470-7491), Title 40 Code of Federal Regulations (CFR) Parts 51 & 52 (40 CFR 51 & 52) (Prevention of Significant Deterioration Program)	Requires PSD review and facility permitting for construction of new or modified major stationary sources of air pollution. PSD review applies to pollutants for which ambient concentrations are not greater than NAAQS.	EPA	PSD Permit with conditions limiting emissions	Agency approval to be obtained before start of construction	5.1.6.1
CAA §171-193, 42 USC §7501 et seq. (New Source Review)	Requires NSR facility permitting for construction or modification of specified stationary sources. NSR applies to pollutants for which ambient concentrations are higher than NAAQS.	GBUAPCD with EPA oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.1
CAA §401 (Title IV), 42 USC §7651 (Acid Rain Program)	Requires quantification of NO_2 and SO_2 emissions, and requires operator to hold allowances.	EPA	Acid Rain permit	Application to be submitted 24 months prior to start of operation.	5.1.6.1
CAA §501 (Title V), 42 USC §7661 (Federal Operating Permits Program)	Establishes comprehensive permit program for major stationary sources.	GBUAPCD with EPA oversight	Title V permit	Application to be submitted 12 months after start of operation.	5.1.6.1
CAA §111, 42 USC §7411, 40 CFR Part 60 (NSPS)	Establishes national standards of performance for new stationary sources.	GBUAPCD with EPA oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.1

Deleted: GBUAPCD with

Deleted: oversight

Deleted: 18

TABLE 5.1-3R
Laws, Ordinances, Regulations, and Standards Applicable to Air Quality

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	AFC Section Explaining Conformance
CAA §112, 42 USC §7412, 40 CFR Part 63 (National Emission Standards for Hazardous Air Pollutants [NESHAPs])	Establishes national emission standards for hazardous air pollutants.	GBUAPCD with EPA oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.1
State					
California Health & Safety Code (H&SC) §41700 (Nuisance Regulation)	Prohibits discharge of such quantities of air contaminants that cause injury, detriment, nuisance, or annoyance.	GBUAPCD with CARB oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.2
H&SC §44300-44384; CCR §93300-93347 (Toxic “Hot Spots” Act)	Requires preparation and biennial updating of facility emission inventory of hazardous substances; risk assessments.	GBUAPCD with CARB oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.2
CCR Title 17, §93115	Reduce DPM and criteria pollutant emissions from stationary diesel-fueled compression-ignition engines	GBUAPCD with CARB oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.2
California Public Resources Code §25523(a); 20 CCR §1752, 2300-2309 (CEC/CARB Memorandum of Understanding)	Requires that CEC’s decision on AFC include requirements to assure protection of environmental quality; AFC required to address air quality protection.	CEC	CEC Conditions of Certification that include the conditions in the FDOC.	Agency approval to be obtained before start of construction	5.1.6.2
Global Warming Solutions Act and other GHG reduction measures	Reduce emissions of GHGs; operator must purchase and surrender GHG allowances.	CEC and CARB	CEC Conditions of certification requiring reporting of GHG emissions and compliance with ARB program requirements.	Agency approval to be obtained before start of construction	5.1.6.2

TABLE 5.1-3R
Laws, Ordinances, Regulations, and Standards Applicable to Air Quality

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	AFC Section Explaining Conformance
Local					
California Health & Safety Code (H&SC) §40001 (Air pollution–general)	Prohibits emissions and other discharges (such as smoke and odors) from specific sources of air pollution in excess of specified levels.	GBUAPCD with CARB oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.3
GBUAPCD Regulation II, Rule 200 (Permits required) and Rule 209-A.E (Power Plants)	Administers air quality regulation program for power plants.	GBUAPCD with CARB oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.3
GBUAPCD Regulation II, Rules 209-A.D and 216 (New Source Review)	Establishes criteria for siting new and modified emission sources.	GBUAPCD with CARB oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.3
GBUAPCD Regulation II, Rule 220 (Construction or Reconstruction of Major Sources of HAPs)	Establishes procedures for review and control of toxic air contaminants from new sources.	GBUAPCD with CARB oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.3
GBUAPCD Regulation IX, New Source Performance Standards	Incorporates federal NSPS standards.	GBUAPCD with CARB oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.3
GBUAPCD Rule 217 (Federal permits)	Implements Acid Rain and Title V permit programs.	GBUAPCD with EPA oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.3
GBUAPCD Rule 209-A	Public Notification Requirement	GBUAPCD with CARB oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.3

TABLE 5.1-3R
Laws, Ordinances, Regulations, and Standards Applicable to Air Quality

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	AFC Section Explaining Conformance
GBUAPCD Regulation III (Permit Fees)	Permit fees	GBUAPCD		Payment of fees required at time of application	5.1.6.3
GBUAPCD Rule 400 (Visible Emissions)	Prohibits visible emissions above certain levels.	GBUAPCD with CARB oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.3
GBUAPCD Rule 401 (Fugitive Dust)	Requires that reasonable precautions be taken to prevent visible particulate matter from being airborne.	GBUAPCD with CARB oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.3
GBUAPCD Rule 402 (Nuisance)	Prohibits emissions and other discharges (such as smoke and odors) from specific sources of air pollution in excess of specified levels.	GBUAPCD with CARB oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.3
GBUAPCD Rule 404-A (Particulate Matter)	Limits emissions of particulate matter.	GBUAPCD with CARB oversight	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.3
GBUAPCD Rule 416 (Sulfur Compounds and Nitrogen Oxides)	Limits NOx and SO_2 emissions from combustion sources.	GBUAPCD	FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	5.1.6.3

5.1.3 Affected Environment

This section describes the regional climate and meteorological conditions that influence the transport and dispersion of air pollutants, as well as the existing air quality within the project region. The data presented in this section are representative of the project site.

The project site is located in the southeastern corner of Inyo County, California. The approximately 3,277-acre site is roughly triangular-shaped, and is bordered on the south by Tecopa Road and on the northeast by the California/Nevada border. The southwest corner of the site is at latitude and longitude 36.01526°N and -115.91270°W, respectively.

5.1.3.1 Geography and Topography

The project site is on the edge of Nevada's southwestern plateau at approximately 2,600 feet above mean sea level, approximately 45 miles west of Las Vegas. The project site is generally flat, and lies in a valley located between the Spring Mountain range to the east (highpoint: Charleston Peak at 11,918 feet above sea level), and the Nopah Mountains to the west (highpoint: Nopah Point at over 6,394 feet above mean sea level).

5.1.3.2 Meteorology and Climate

Consistent with the typical weather of a high desert climate, southeastern Inyo County is generally characterized by low precipitation, hot summers, and cold winters. Daytime temperatures during the summer months often reach into the 100s, although gentle breezes, extremely low humidity, and the relatively high elevation combine to keep nighttime temperatures down to the 70s and low 80s. Spring and fall temperatures range from the 60s in March to the 80s and 90s in May. Temperatures in September are usually in the 90s and drop off to the 60s by late November. Winter nights are usually cold, with temperatures dropping to the 30s for short periods. Daytime temperatures are typically in the 50s, with clear skies. The mountain ranges surrounding the area also have a major influence on climate, serving as a meteorological boundary that effectively removes moisture from the air flowing into the valley.

The nearest full-time meteorological monitoring station to the project site is maintained by the National Weather Service Cooperative Network and is located at Pahrump, on SR 160 at the southern tip of Nye County, Nevada—at latitude 35°16′N, longitude 115°59′W. Based on 97 years of data collection (1914–2010), the annual average temperature measured in the area is 61.8 degrees Fahrenheit (°F). The hottest month, July, has an average maximum temperature of 101.6°F and an average minimum temperature of 67.3°F. The coldest month, December, has an average maximum temperature of 57.9°F and an average minimum temperature of 26.6°F.

Monthly mean precipitation at Pahrump ranges from 0.84 inches in February to 0.09 inches in June. The average annual precipitation in the project area is about 4.7 inches, half of which falls from December through March. Relative humidity levels are low, with relative humidity averaging about 29% annually. Long-term average temperature and precipitation data are summarized in Table 5.1-4.

Deleted: Table 5.1-4

TABLE 5.1-4
Average Temperatures and Precipitation in Pahrump, NV (1914-2010)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average Maximum Temperature (°F)	57.3	62.5	68.0	75.5	85.2	95.2	101.6	99.8	92.6	81.5	67.5	57.9	78.7
Average Minimum Temperature (°F)	26.9	32.0	36.8	43.1	52.1	59.9	67.3	65.5	56.7	44.7	33.8	26.6	45.5
Precipitation (inches)	0.66	0.84	0.55	0.31	0.2	0.09	0.31	0.32	0.34	0.23	0.37	0.5	4.7

Source: Western Regional Climate Center (http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?nv5890)

At the Pahrump station, the prevailing wind direction is from the south through southeast, and the average wind speed is 2.1 meters per second. Winds are typically of light to moderate strength. Composite annual and quarterly wind roses are shown in Figures 5.1-1 through 5.1-5 (figures are provided at the end of this section). Individual annual and quarterly wind roses and quarterly wind frequency distributions for the project area are provided in Appendix 5.1A.

5.1.3.3 Overview of Air Quality Standards

EPA has established NAAQS for ozone, NO_2, CO, SO_2, PM_{10}, $PM_{2.5}$, and airborne lead. Areas with ambient levels above these standards are designated by EPA as "nonattainment areas" subject to planning and pollution control requirements that are more stringent than standard requirements.

CARB has established California ambient air quality standards for ozone, CO, NO_2, SO_2, sulfates, PM_{10}, $PM_{2.5}$, airborne lead, hydrogen sulfide, and vinyl chloride at levels designed to protect the most sensitive members of the population, particularly children, the elderly, and people who suffer from lung or heart diseases.

Both state and national air quality standards consist of two parts: an allowable concentration of a pollutant, and an averaging time over which the concentration is to be measured. Allowable concentrations are based on the results of studies of the effects of the pollutants on human health, crops and vegetation, and, in some cases, damage to paint and other materials. The averaging times are based on whether the damage caused by the pollutant is more likely to occur during exposures to a high concentration for a short time (one hour, for instance), or to a relatively lower average concentration over a longer period (8 hours, 24 hours, or 1 month). For some pollutants there is more than one air quality standard, reflecting both short-term and long-term effects. Table 5.1-5 presents the NAAQS and California ambient air quality standards for selected pollutants. The California standards are generally set at concentrations lower than the federal standards and, in some cases, have shorter averaging periods.

Deleted: Table 5.1-5

TABLE 5.1-5
National and California Ambient Air Quality Standards

Averaging Time	Averaging Time	California Standards		Federal Standards		
		Concentration	**Method**	**Primary**	**Secondary**	**Method**
Ozone	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.07 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM_{10})	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No Separate State Standard		35 µg/m^3 a	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15.0 µg/m^3		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	Gas Phase Chemiluminescence	53 ppb (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (339 µg/m^3)		100 ppb [b] (188 µg/m^3)	None	
Sulfur Dioxide (SO_2)	24 Hour	0.04 ppm (105 µg/m^3)	Ultraviolet Fluorescence	—	—	Ultraviolet Fluorescence Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	1 Hour	0.25 ppm (655 µg/m^3)		75 ppbc (196 µg/m^3)	—	
Lead	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average	—		0.15 µg/m^3		
Visibility Reducing Particles	8 Hour	Extinction Coefficient of 0.23 per kilometer—visibility of ten miles or more due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			

TABLE 5.1-5
National and California Ambient Air Quality Standards

Averaging Time	Averaging Time	California Standards		Federal Standards		
		Concentration	Method	Primary	Secondary	Method
Vinyl Chloride	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

[a] To attain this standard, the 3-year average of the 98th percentile of the daily concentrations must not exceed 35 µg/m^3.

[b] To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average must not exceed 100 ppb.

[c] To attain this standard, the 3-year average of the 99th percentiles of the daily maximum 1-hour average must not exceed 75 ppb.

ppm= parts per million

Source: California Air Resources Board (09/08/10)

5.1.3.4 Existing Air Quality

All ambient air quality data presented in this section were obtained from data published by CARB on the ADAM website and/or by EPA on the AIRS data website. Ambient air concentrations of ozone, NO_2, SO_2, CO, PM_{10}, and $PM_{2.5}$ are recorded at monitoring stations throughout California and Nevada. The immediate area surrounding the project site is sparsely populated valley, bordered by mountain ranges to the east and west. There is no single air quality monitoring station in the region that collects all pollutants of interest; most stations record measurements for only one or two criteria pollutants, except for those stations located in urban areas. The monitoring stations were generally positioned to represent area-wide ambient conditions rather than the localized impacts of any particular emission source or group of sources. In rural areas of the county, pollutant concentrations are not expected to vary dramatically from one location to the next, because the emission sources are few and widely distributed.

Monitoring locations were chosen based on their proximity to and representativeness of conditions at the project site. The monitoring locations listed in Table 5.1-6 were deemed representative of the project location, and were chosen to represent background pollutant concentrations for the project area. The locations of these monitoring stations relative to the project site are shown in Figure 5.1-6.

TABLE 5.1-6
Representative Background Ambient Air Quality Monitoring Stations

Pollutant	Monitoring Station	Distance to Project Site
Ozone, NO_2, PM_{10}, $PM_{2.5}$	Jean, NV (Clark County)	34 miles
CO	Barstow, CA (San Bernardino County)	97 miles
SO_2, NO_2	Trona, CA (San Bernardino County)	82 miles
Lead	San Bernardino, CA (San Bernardino County)	150 miles

Ozone. Ozone is an end-product of complex reactions between VOC and NOx in the presence of ultraviolet solar radiation. VOC and NOx emissions from vehicles and stationary sources, combined with daytime wind flow patterns, mountain barriers, temperature inversions, and intense sunlight, generally result in the highest o concentrations. For purposes of federal air quality planning, the entire GBUAPCD is classified as an attainment area with respect to national ambient standards for ozone; however, in early 2009 CARB submitted its recommendations for area designations for the revised federal 8-hour ozone standard. That recommendation included the redesignation of southern Inyo County (including the project area) to nonattainment for ozone. With respect to state standards, the entire GBUAPCD is classified as nonattainment for the 8-hour ozone standard, with the exception of Alpine County; and either unclassified (Alpine and Inyo counties) or nonattainment (Mono County) for the 1-hour state ozone standard. Table 5.1-7 shows the measured ozone levels at the Jean, Nevada, station during the period from 2001 to 2010. Note that the number of exceedances of the 1-hour and 8-hour ozone CAAQS is not included on this table, as those statistics are not tabulated for monitoring stations outside of California. However, it can be seen that the highest 8-hour averages at Jean have exceeded the California state standard of 0.07 ppm every year from 2001 through 2010, while monitored concentrations were above the state 1-hour standard of 0.09 ppm from 2001 through 2003 and again in 2007.

Deleted: Table 5.1-7

TABLE 5.1-7
Ozone Levels in Clark County, Nevada, Jean Monitoring Station, 2001-2010 (ppm)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Highest 1-Hour Average	0.098	0.099	0.095	0.094	0.103	0.092	0.092	0.087	0.082	0.082
Number of Days Exceeding Old Federal Standard (0.12 ppm, 1-hour)[a]	0	0	0	0	0	0	0	0	0	0
Highest 8-hour Average	0.082	0.093	0.089	0.083	0.092	0.083	0.088	0.078	0.079	0.076
Number of Days Exceeding Federal Standard (0.075 ppm, 8-hour)[b]	8	18	24	10	17	13	12	1	0	0

[a] EPA revoked the 1-hour ozone standard in all areas on June 15, 2005.

[b] To attain this standard, the 3-year average of the fourth-highest maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (Effective May 27, 2008).

Source: EPA AIRData website (http://www.epa.gov/air/data/index.html).

Nitrogen Dioxide. NO_2 is formed primarily from reactions in the atmosphere between NO (nitric oxide) and oxygen (O_2) or ozone. NO is formed during high-temperature combustion processes, when the nitrogen and oxygen in the combustion air combine. Although NO is much less harmful than NO_2, it can be converted to NO_2 in the atmosphere within a matter of hours, or even minutes, under certain conditions. The control of NO and NO_2 emissions is also important because of the role of both compounds in the atmospheric formation of ozone.

NO_2 concentrations were monitored at Jean until 2007. More recent NO_2 data are available from Trona, California. Table 5.1-8 shows NO_2 levels recorded at the Trona and Jean stations for the years 2001 through 2010, respectively.

Deleted: Table 5.1-8

Trona is located in the Searles Valley area of the Mojave Desert Air Basin, adjacent to the China Lake Naval Air Weapons Station at Ridgecrest. The Trona area is more developed than the project area, as well as being closer to the urban areas of southern California, so background concentrations of air pollutants are generally higher than concentrations in the project area. While NO_2 measured levels at Jean are more representative of levels at the project site, the concentrations measured at Trona are more current and conservatively overestimate NO_2 concentrations at the project site.

TABLE 5.1-8
Nitrogen Dioxide Levels in the Project Area, Trona and Jean (NV) Monitoring Stations, 2001-2010 (ppm)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Highest 1-Hour Average, Trona	0.055	0.051	0.052	0.055	0.053	0.050	0.055	0.062	0.049	0.052
Highest 1-Hour Average, Jean	0.038	0.043	0.041	0.032	0.039	0.036	[a]	[a]	[a]	[a]
Annual Average, Trona	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	a
Annual Average, Jean	0.004	0.004	0.004	0.004	0.004	0.004	[a]	[a]	[a]	[a]
Days Over State Standard (0.18 ppm, 1-hour)	0	0	0	0	0	0	0	0	0	0
Days Over Federal Standard (0.100 ppm, 1-hour)[b]	0	0	0	0	0	0	0	0	0	0

[a] Insufficient (or no) data were available to determine the number.

[b] The new federal 1-hour average NO_2 standard of 0.100 ppm was announced by EPA on February 9, 2010, and became effective April 12, 2010. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average values at each monitor must not exceed 100 ppb.

Source: CARB ADAM Website (www.arb.ca.gov/adam/welcome.html).

For purposes of both state and federal air quality planning, GBUAPCD is in attainment with regard to NO_2. During the period from 2001 to 2010 (2007 for Jean), there were no violations of the CAAQS 1-hour standard (0.18 ppm) at either station. The highest 1-hour concentration recorded in the area during this 10-year period was 0.062 ppm at Trona in 2008. A new federal 1-hour NO_2 standard of 0.100 ppm became effective on April 12, 2010. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within the GBUAPCD must not exceed 0.100 ppm; this standard has not been exceeded at either station since at least 2001. Table 5.1-8 also shows that annual average NO2 concentrations have remained well below the annual NAAQS (0.053 ppm) and annual CAAQS (0.030 ppm) at both stations during this period.

Deleted: Table 5.1-8

Carbon Monoxide. Carbon monoxide is a product of incomplete combustion and is emitted principally from automobiles and other mobile sources of pollution. It is also a product of combustion from stationary sources (both industrial and residential) burning fuels. Peak CO levels occur typically during winter months due to a combination of higher emission rates and stagnant weather conditions.

Table 5.1-9 shows the available data on maximum 1-hour and 8-hour average CO levels recorded at the Barstow, California, station during the period from 2001 to 2010. As indicated by this table, the maximum measured 1-hour average CO levels comply with the NAAQS and CAAQS (35.0 ppm and 20.0 ppm, respectively) and the maximum 8-hour

Deleted: Table 5.1-9

values comply with the NAAQS and CAAQS of 9.0 ppm. The highest individual 1-hour and 8-hour CO concentrations at this station from 2001 through 2010 were 3.5 ppm and 1.5 ppm, recorded in 2006 and 2003, respectively. Because ambient CO concentrations are generally highest in the immediate vicinity of areas of high motor vehicle traffic, the concentrations at the Barstow monitoring station located in a more densely populated area compared to the project site provide a conservative overestimate of actual concentrations in the project site area. For purposes of both state and federal air quality planning, the GBUAPCD is in attainment with regard to CO.

TABLE 5.1-9
Carbon Monoxide Levels in San Bernardino County, Barstow Monitoring Station, 2001-2010 (ppm)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Highest 1-Hour Average	2.3	1.9	2.7	1.6	3.3	3.5	1.4	1.4	0.9	0.9
Highest 8-Hour Average	1.2	1.1	1.5	1.2	1.3	1.2	0.7	1.2	0.9	*
Days Over State Standard (9 ppm, 8-hour)	0	0	0	0	0	0	0	0	0	0
Days Over Federal Standard (9 ppm, 8-hour)	0	0	0	0	0	0	0	0	0	0

*Insufficient (or no) data were available to determine the number.

Note: Data completeness for CO concentrations at the Barstow station averaged 95 percent over the ten-year analysis period.

Sources: CARB ADAM Website (www.arb.ca.gov/adam/welcome.html); EPA AIRS Website (www.epa.gov/air/data/index.html)

Sulfur Dioxide. SO_2 is produced by the combustion of any sulfur-containing fuel. It is also emitted by chemical plants that treat or refine sulfur or sulfur-containing chemicals. Natural gas contains nearly negligible sulfur, whereas fuel oils may contain much larger amounts. Because of the complexity of the chemical reactions that convert SO_2 to other compounds (such as sulfates), peak concentrations of SO_2 occur at different times of the year in different parts of California, depending on local fuel characteristics, weather, and topography. The GBUAPCD is considered to be in attainment for SO_2 for purposes of state and federal air quality planning.

Table 5.1-10 shows the available data on maximum 1-hour, 3-hour, 24-hour, and annual average SO_2 levels recorded at the Trona, California, station during the period from 2001 to 2010. As indicated by this table, the maximum measured 1-hour average SO_2 levels comply with the new NAAQS (0.075 ppm) and CAAQS (0.25 ppm), the maximum 3-hour average SO_2 levels comply with the NAAQS (0.5 ppm), and the maximum 24-hour values comply with the CAAQS of 0.04 ppm. The federal 24-hour and annual standards for SO_2 have been superseded by the new 1-hour standard, which became effective on August 23, 2010.

Deleted: Table 5.1-10

TABLE 5.1-10
Sulfur Dioxide Levels in San Bernardino County, Trona Monitoring Station, 2001-2010 (ppm)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Highest 1-Hour Average	0.012	0.012	0.008	0.019	0.018	0.033	0.014	0.036	0.011	[a]
Highest 3-Hour Average	0.010	0.009	0.005	0.010	0.011	0.017	0.009	0.006	0.008	[a]
Highest 24-Hour Average	0.007	0.007	0.003	0.016	0.005	0.006	0.005	0.005	0.003	[a]
Annual Average	0.001	0.001	0.000	0.003	0.003	0.003	0.000	0.000	0.000	[a]
Days Over State Standard (0.25 ppm, 1-hour)	0	0	0	0	0	0	0	0	0	0
Days Over Federal Standard (75 ppb, 1-hour)[b]	0	0	0	0	0	0	0	0	0	0

[a] Insufficient (or no) data were available to determine the number.

[b] Final rule signed June 22, 2010, effective August 23, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

Sources: CARB ADAM Website (www.arb.ca.gov/adam/welcome.html); EPA AIRS Website (www.epa.gov/air/data/index.html)

Respirable Particulate Matter (PM_{10}). Particulates in the air are caused by a combination of wind-blown fugitive dust; particles emitted from combustion sources and manufacturing processes; and organic, sulfate, and nitrate aerosols formed in the air from emitted hydrocarbons, sulfur oxides, and nitrogen oxides. Particulates with a diameter less than or equal to 10 microns are referred to as PM_{10}, and are regulated because they can be inhaled, leading to health effects. Fine particulates, referred to as $PM_{2.5}$ and having a diameter equal to or less than 2.5 microns, are a subset of PM_{10} that is also regulated. $PM_{2.5}$ standards are discussed later in this section.

PM_{10} is the most serious air quality issue in the GBUAPCD region, and the entire district is classified as nonattainment for the state PM_{10} standards. For purposes of federal air quality planning, the entire district is designated as "unclassified" with the exception of the Coso Junction area, which is designated attainment, and the three areas listed below, which are designated as nonattainment for the federal PM_{10} standards.

- Owens Lake is one of the largest single sources of PM_{10} in the United States. GBUAPCD has collaborated with the City of Los Angeles and the Los Angeles Department of Water and Power to implement dust control measures that have significantly reduced total PM_{10} emissions from the dry lakebed. Owens Lake is over 100 km west of the project site, separated by significant terrain and Death Valley National Park.
- Mono Lake also violates the federal PM_{10} standard, and the State Water Resources Control Board (SWRCB) has set requirements for raising the level of Mono Lake level as a mitigation measure. The lake has risen about 10 feet since the mid-90s and PM_{10} levels at some sites have decreased. Current estimates are that the lake level needs to rise an additional 9 feet in order to sufficiently control PM_{10} emissions. Mono Lake is several hundred miles northwest of the project site.
- The Mammoth Lakes area has high levels of PM_{10} in the winter months due to a combination of wood smoke and cinders used on icy roads for better traction during the winter. Mammoth Lakes is also several hundred miles northwest of the project site.

Although the PM_{10} monitoring site at Pahrump, Nevada, is closer to the project site than the Jean station, the Pahrump data are strongly affected by local windblown dust, and therefore are not representative of regional background concentrations. As noted by the Nevada Bureau of Air Quality Planning (NVBAQP, 2010):

> *Fast population growth in the '90s through mid-2006 created intensive development. Large parcels of land were cleared of vegetation, subdivided and prepared for housing construction. Dirt and gravel roads were constructed. Many of the planned housing developments never materialized and the lots are now disturbed, vacant areas.*
>
> *As a result of the disturbed, vacant land and the number of dirt and gravel roads, fugitive dust (particulate matter less than 10 microns, or PM) became a problem. The Pahrump valley is subject to high winds and these winds often create dust storms.*

However, the project site is not downwind of the Pahrump area under most meteorological conditions[2] and therefore would not be expected to be affected by the dust storms that create high localized PM_{10} concentrations in Pahrump. Consequently, PM_{10} concentrations monitored at Jean better represent conditions in the project area.

Table 5.1-11 shows the maximum PM_{10} levels recorded at the Jean, Nevada, monitoring station during the period from 2001 through 2010 and the arithmetic annual average concentrations for the same period. (The arithmetic annual average is simply the arithmetic mean of the daily observations.) This table shows that maximum 24-hour PM_{10} levels recorded at Jean exceeded the CAAQS state standard of 50 μg/m^3 from 2001 through 2009. The maximum daily concentration recorded at Jean during the analysis period was 208 μg/m^3 in 2002, although that is the only year in which 24-hour average concentrations exceeded the applicable federal standard. The maximum annual arithmetic mean concentration, recorded in 2005, was 17.0 μg/m^3, well below the federal annual standard of 50 μg/m^3. The federal annual PM_{10} standard was revoked by the EPA in 2006 due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution. The project area is considered a federal attainment area for PM_{10}.

Deleted: Table 5.1-11

TABLE 5.1-11
PM_{10} Levels in Clark County, Nevada, Jean Monitoring Station, 2001-2010 (μg/m^3)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Highest 24-Hour Average	75.0	208.0	124.0	71.0	66.0	62.0	60.0	96.0	81.3	49
Annual Arithmetic Mean	13.0	16.0	15.0	16.0	17.0	12.0	13.0	14.0	12.4	8.5
Days Over Federal Standard (150 μg/m^3)*	0	1.1	0	0	0	0	0	0	0	0

*On December 17, 2006, the annual PM_{10} federal standard (50 μg/m^3) was revoked.
Source: EPA AIRS Website (www.epa.gov/air/data/index.html)

Fine Particulates ($PM_{2.5}$). Fine particulates result from fuel combustion in motor vehicles and industrial processes, residential and agricultural burning, and atmospheric reactions involving NOx, SOx, and organics. Fine particulates are referred to as $PM_{2.5}$ and have a diameter equal to or less than 2.5 microns. In 1997, EPA established annual and 24-hour

---

[2] See wind roses in Appendix 5.1A.

NAAQS for $PM_{2.5}$ for the first time. The most recent revision to the standard regulating the 3-year average of the 98th percentile of 24-hour $PM_{2.5}$ concentrations (35 µg/m^3) became effective on December 17, 2006.

The $PM_{2.5}$ data in Table 5.1-12 show that the national 24-hour average NAAQS of 35 µg/m^3 has not been exceeded in the project area during the ten-year analysis period. The maximum recorded 24-hour average value was 20.5 µg/m^3 in 2001. The maximum annual arithmetic mean of 4.9 µg/m^3, recorded in 2008, is below both the national standard of 15 µg/m^3 and the California standard of 12 µg/m^3. The GBUAPCD is in attainment with the state $PM_{2.5}$ standard, and is classified as "unclassifiable/attainment" for the federal $PM_{2.5}$ standards.

Deleted: Table 5.1-12

TABLE 5.1-12
$PM_{2.5}$ Levels in Clark County, Nevada, Jean Monitoring Station, 2001-2010 (µg/m^3)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Highest 24-Hour Average (federal only)*	20.5	14.1	13.2	8.2	11.3	11.4	13.7	13.8	13.0	13.5
Annual Arithmetic Mean	4.2	4.0	3.7	3.4	3.8	3.5	4.0	4.9	4.0	3.5
Days Over Federal Standard (35 µg/m^3)*	0	0	0	0	0	0	0	0	0	0

*EPA lowered the 24-hour standard from 65 µg/m3 to 35 µg/m3 on December 17, 2006. Compliance with this standard is based on the 3-year average of the 98th percentile daily concentrations.

Source: EPA AIRS Website (www.epa.gov/air/data/index.html)

Airborne Lead. Lead pollution has historically been emitted predominantly from the combustion of fuels. However, legislation in the early 1970s required a gradual reduction of the lead content of gasoline. Beginning with the introduction of unleaded gasoline in 1975, lead levels have been dramatically reduced throughout the U.S., and violations of the ambient standards for this pollutant have been virtually eliminated.

On October 15, 2008, EPA revised the federal ambient air quality standard for lead, lowering it from 1.5 µg/m^3 to 0.15 µg/m^3 for both the primary and the secondary standard. EPA determined that numerous health studies are now available that demonstrate health effects at much lower levels of lead than previously thought. EPA subsequently published the final rule in the Federal Register on November 12, 2008.

In addition to revising the level of the standard, EPA changed the averaging time from a quarterly average to a rolling three-month average. The level of the standard is "not to be exceeded" and is evaluated over a three-year period. Lead levels are measured as lead in total suspended particulate (TSP). The revised lead standard also includes new monitoring requirements.

Ambient lead levels are monitored in San Bernardino. Table 5.1-13 lists the federal air quality standard for airborne lead and the levels reported in San Bernardino between 2001 and 2010. Maximum quarterly levels are not reported on EPA's website. Because the

Deleted: Table 5.1-13

maximum 24-hour averages must be higher than the quarterly average, the data show that lead levels are actually below the federal standard.[3]

TABLE 5.1-13
Airborne Lead Levels in San Bernardino County, San Bernardino Monitoring Station, 1997-2006 ($\mu g/m^3$)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Highest 24-hour Average	0.07	0.04	0.35	0.03	0.03	0.03	0.07	0.02	0.02	*
Days Over Federal Standard (1.5 $\mu g/m^3$, quarterly)	0	0	0	0	0	0	0	0	0	*

*Insufficient (or no) data were available to determine the number.
Source: EPA AirData website (http://www.epa.gov/air/data/index.html).

Particulate Sulfates. Sulfate compounds found in the lower atmosphere consist of both primary and secondary particles. Primary sulfate particles are directly emitted from open pit mines, dry lakebeds, and desert soils. Combustion of sulfur-containing fuels is another source of sulfates, both primary and secondary. Secondary sulfate particles are produced when oxides of sulfur (SOx) emissions are transformed into particles through physical and chemical processes in the atmosphere. Particles can be transported long distances.

The GBUAPCD is classified as an attainment area with respect to the state ambient standard for sulfates; there is no federal standard.

Other State-Designated Criteria Pollutants. Along with sulfates, California has designated hydrogen sulfide and visibility-reducing particles as criteria pollutants, in addition to the federal criteria pollutants. According to the GBUAPCD, the Coso geothermal development east of Coso Junction on the China Lakes Naval Weapons Center property has the potential to violate the state standard for hydrogen sulfide, but has not yet done so because the standard does not apply on the Naval Weapons Center property. The GBUAPCD has worked with the operators of that facility to minimize the emissions, and to date there have been no violations of the standards off the base. Currently, the Mono County and Inyo County portions of the GBUAPCD are classified as attainment for hydrogen sulfide, while the remainder of the district is "unclassified" for this pollutant. The entire GBUAPCD is classified as attainment for visibility-reducing particles.

Attainment status for the project area is summarized in Table 5.1-14.

Deleted: Table 5.1-14

---

[3] ARB no longer reports summary lead statistics on its website.

TABLE 5.1-14
2010 Attainment Status in Inyo County (Project Area)

	Attainment Status	
Pollutant	**Federal Standards**	**California Standards**
Ozone – 1-hour	Revoked 6/16/05	Unclassified
Ozone – 8-hour	Unclassified/Attainment*	Nonattainment
CO – 8-hour	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Unclassified	Nonattainment
$PM_{2.5}$	Unclassified/Attainment	Attainment

*As discussed above, CARB proposed the redesignation of southern Inyo County to nonattainment for the federal 8-hour average ozone standard in early 2009; EPA has not yet acted on this redesignation request.

Source: CARB, Air Quality Data Branch, December 2009; available at http://www.arb.ca.gov/desig/adm/adm.htm (accessed May 2011)

5.1.4 Environmental Analysis

Ambient air quality impact analyses for the project have been conducted to satisfy the GBUAPCD and CEC requirements for analysis of impacts from criteria pollutants (NO_2, CO, PM_{10}, $PM_{2.5}$ and SO_2) and noncriteria pollutants during project construction and operation.[4] The analyses cover each phase of the project. Section 5.1.4.1 gives an overview of the analytical approach and the emitting units at the facility. Section 5.1.4.2 discusses facility operations. Section 5.1.4.3 presents the emissions for project operation and construction of the project. Section 5.1.4.4 discusses emissions and fuel use monitoring, and Section 5.1.4.5 presents the ambient air quality impacts of project construction and operation.

5.1.4.1 Overview of the Analytical Approach to Estimating Facility Impacts

The following sections describe the emission sources that have been evaluated, the results of the ambient impact analyses, and the evaluation of project compliance with the applicable air quality regulations, including the GBUAPCD's NSR requirements. These analyses are designed to confirm that the project's design features lead to less-than–significant impacts even with the following conservative analysis assumptions and procedures: maximum allowable emission rates, project operating schedules that lead to maximum emissions, worst-case meteorological conditions, and adding the worst-observed existing air quality to the highest potential ground-level impact from modeling, even when all of these situations could not physically occur at the same time.

5.1.4.1.1 Emitting Units

The project comprises two 250 MW (net) plants—Solar Plant 1 to the north and Plant 2 to the south—and a common area. The relative locations of the three areas are shown in Figure 2.1-2 (Section 2.0, Project Description).

---

[4] As discussed in Section 5.1-1, transmission and gas line construction will take place in Nevada.

Each plant will have five emitting units, consisting of two natural-gas-fired boilers, two diesel fuel-fired emergency engines, and a wet surface air cooler. The common area will contain diesel fuel-fired emergency equipment consisting of a small emergency generator and a fire pump.

Two types of boilers will be used at each power block. Each boiler will be equipped with low-NOx burners and flue gas recirculation (FGR) for NOx control; CO will be controlled using good combustion practices; and particulate and VOC emissions will be minimized through the use of natural gas as the fuel. Specifications for the new boilers are summarized in Table 5.1-15R.

Each plant will use one 249 MMBtu/hr natural-gas-fired auxiliary boiler to preheat the solar boiler and steam turbine generator piping before solar energy is available and to cool the piping in the evening. This will enhance project efficiency by allowing solar flux to maximize output more quickly than if solar heating alone were used to preheat the entire system. During cloudy days or in case of emergency shutdown, the auxiliary boilers may be used to keep the system hot to facilitate plant restart. Finally, the auxiliary boilers will be used up to several hours per day for augmenting the solar operation when solar energy diminishes.

Additionally, one small (15 MMBtu/hr) natural-gas-fired boiler, called a nighttime preservation boiler, will be used at each plant to provide superheated steam to keep the steam turbine generators and boiler pump gland systems under vacuum overnight and during other shutdown periods when steam is not available. Using these small boilers will be more efficient than allowing these systems to cool and then using the larger auxiliary boilers to reestablish the vacuums in the morning.

TABLE 5.1-15R
Natural Gas Boiler Specifications

	Auxiliary Boilers	**Nighttime Preservation Boilers**
Make & Model	Rentech D-type water tube or equivalent	Rentech or equivalent
Fuel	Natural gas	Natural gas
Maximum Boiler Heat Input Rate	249 MMBtu/hr @ HHV	<15 MMBtu/hr @ HHV
Steam Production Rate	174,000 lb/hr	10,000 lb/hr
Stack Exhaust Temperature	300°F	300°F
Exhaust Flow Rate	~74,000 acfm	~4,400 acfm
Exhaust O_2 Concentration, dry volume	3.0%	3.0%
Exhaust CO_2 Concentration, dry volume	10.2%	10.2%
Exhaust Moisture Content, wet volume	16.3%	16.3%

Deleted: eight

Deleted: five

Deleted: Three

Deleted: Table 5.1-15

Deleted: To augment the solar output when solar energy diminishes or during transient cloudy conditions, each plant may utilize three 500 MMBtu/hr natural-gas-fired auxiliary boilers that may be operated up to several hours on summer weekdays. The auxiliary boilers may also be used to extend daily power generation. However, on an annual basis heat input from natural gas will be limited by fuel use and other conditions to less than 10 percent of the heat input from the sun..

Deleted: startup

Deleted: startup

Deleted: 12

Deleted: startup

Deleted: Because of their low heat input, the nighttime preservation boilers are exempt from GBUAPCD permitting requirements (District Rule 201.F, exempting "Steam generators…that have a maximum heat input rate of less than 15 million British Thermal Units (BTU) per hour (gross), and are fired exclusively with natural gas…").

Deleted: **Auxiliary Boilers**

Deleted: **Startup**

Deleted: Rentech or equivalent

Deleted: Cleaver Brooks

Deleted: Natural gas

Deleted: 500 MMBtu/hr @ HHV

Deleted: 12

Deleted:

Deleted: 350,000 lb/hr

Deleted: 200,000

Deleted: 8,000

Deleted: 360°F

Deleted: 360

Deleted: 325

Deleted: ~155,300 acfm

Deleted: 84,000

Deleted: 3,700

Deleted: 3.0%

Deleted: 10.2%

Deleted: 16.3%

TABLE 5.1-15R
Natural Gas Boiler Specifications

		Auxiliary Boilers	Nighttime Preservation Boilers
	NOx	Low-NOx Burners/FGR (9.0 ppmvd NOx @ 3% O_2)	Low-NOx Burners/FGR (9.0 ppmvd NOx @ 3% O_2)
Emission Controls:	CO	Combustion controls (25 ppmvd @ 3% O_2)	Combustion controls (50 ppmvd @ 3% O_2)
	VOC	Combustion controls (12.6 ppmvd @ 3% O_2)	Combustion controls (12.6 ppmvd @ 3% O_2)

Deleted: **Auxiliary Boilers**

Deleted: **Startup**

Deleted: Low-NOx Burners/FGR (9.0 ppmvd NOx @ 3% O_2)

Deleted: Combustion controls (50 ppmvd @ 3% O_2)

Deleted: Combustion controls (12.6 ppmvd @ 3% O_2)

Deleted: 10

Table 5.1-16 presents the nominal fuel properties for the CPUC-regulated natural gas to be used by the boilers.

Deleted: Table 5.1-16

TABLE 5.1-16
Nominal Fuel Properties—Natural Gas

Component Analysis		Chemical Analysis	
Component	**Average Concentration, Volume**	**Constituent**	**Percent by Weight**
CH_4	96.1%	C	71 %
C_2H_6	1.8%	H	24 %
C_3H_8	0.3%	N	3 %
Iso-C_4H_{10}	0.05%	O	2 %
n-C_4H_{10}	0.05%	S	0.75 gr/100 scf
iso-C_5H_{12}	0.01%	Higher Heating Value	1,020 Btu/scf
n-C_5H_{12}	0.01%		22,840 Btu/lb
C_6+	0.03%		
N_2	0.04%		
CO_2	1.24%		
S	<0.0001%		
Total	100%		

Each plant will also have one 2,500 kW diesel emergency generator at each power block to provide backup power to the facility in case of loss of line power; there will be one smaller 250 kW diesel emergency generator to provide emergency power to the common area (for a total of three emergency generators). Specifications for these emergency generators are provided in Table 5.1-17R.

Deleted: Table 5.1-17

TABLE 5.1-17R
Emergency Generator Specifications

	Power Blocks (2 total)	Common Area
Make & Model	Caterpillar 3516C or equivalent	Caterpillar C9 ATAAC or equivalent
CARB Cert	U-R-001-0387 (Tier 2)	U-R-001-0373 (Tier 3)
Fuel	CARB diesel	CARB diesel
Generator Rating, kW	2,500	250
Engine Rating, bhp	3,633	398
Fuel Consumption, gallons/hr	175	20
Stack Exhaust Temperature	925°F	855°F
Exhaust Flow Rate	19,600 acfm	2,250 acfm

Deleted: C175-16 SCAC
Deleted: 3,354
Deleted: 335
Deleted: 19.4
Deleted: 831.4
Deleted: 853.9
Deleted: 20,461
Deleted: 2,242

One diesel fire pump engine will be located in each power block as well as in the common area (total of three fire pump engines) to comply with fire codes. Typical specifications for these units are provided in Table 5.1-18R.

Deleted: Table 5.1-18

TABLE 5.1-18R
Specifications for the Diesel Fire Pump Engines

	Power Block Fire Pump Engines	Common Area Fire Pump Engine
Make & Model	Cummins CFP7E-F30 or equivalent	Cummins CFP7E-F30 or equivalent
CARB Cert	U-R-002-0516	U-R-002-0516
Fuel	CARB diesel	CARB Diesel
Engine Rating, bhp	200	200
Pump Speed, RPM	2100	2100
Fuel Consumption, gallons/hr	12.0	12.0
Stack Exhaust Temperature	975°F	975°F
Exhaust Flow Rate	1,650 acfm	1,650 acfm

Deleted: CFP9E-F40
Deleted: CFP9E-F20
Deleted: 0521
Deleted: 0521
Deleted: 271
Deleted: 233
Deleted: 1470
Deleted: 1470
Deleted: 14.0
Deleted: 1083
Deleted: 1033
Deleted: 1,584
Deleted: 1,527

Diesel Fuel Supply and Storage

Diesel fuel for the emergency generators and fire pump engines will be stored in individual day tanks located adjacent to the units. The fire pump engine day tanks will be located in the individual fire pump houses. The diesel generator day tanks will be located in the generator skid bases. Diesel fuel consumption rates and diesel tank capacities are shown in Table 5.1-19R.

Deleted: Table 5.1-19

TABLE 5.1-19R
Maximum Diesel Fuel Use and Tank Capacities

Engine	Maximum Fuel Consumption Rate, gal/hr	Target Fuel Supply, hours	Fuel Day Tank Capacity, gal
Emergency Diesel Generators, Power Blocks	175	8	1500
Emergency Diesel Generator, Common Area	20	60	500
Diesel Fire Pumps, Power Blocks	12	45	550
Diesel Fire Pump, Common Area	12	45	550

Deleted: 1600
Deleted: 19.4
Deleted: 8
Deleted: 180
Deleted: 14
Deleted: 25
Deleted: 350
Deleted: 25
Deleted: 300

Diesel fuel for the mirror cleaning vehicles will be stored in an 8,000-gallon, double-walled, aboveground concrete storage tank. Nominal dimensions will be 23 feet long, 8 feet wide and 9 feet high.

The tanks are exempt from GBUAPCD permitting requirements per Rule 201.H.4 (exempting "Unheated storage of organic materials with an initial boiling point of 300 F or greater").

Wet Surface Air Coolers

The main process steam cooling system will use dry cooling. The Applicant proposes to use one partial dry-cooling system (PDCS) in each power block for the auxiliary systems, including, but not limited to, generator and lube oil cooling for major equipment. PDCS was selected because dry cooling cannot provide adequate cooling for these systems when ambient temperatures exceed approximately 85°F. The PDCS is a closed-loop two-stage cooling system. In this system, the heat will be rejected using ambient air in a dry cooling system, followed by a closed-loop evaporative fluid cooler for additional cooling at higher ambient temperatures. Under most conditions, all cooling will be provided by the dry portion of the cooling system. The wet portion is operated only when the ambient temperature is 86°F or higher.

The dry cooling portion of the PDCS has no air emissions. 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. Particulate emissions result from evaporation of the cooling water that drifts from the fluid cooler. Deionized water will be used for makeup water. As a result, the total dissolved solids (TDS) level of the recirculating water will still be relatively low (<1500 ppmw) even after 20 cycles of concentration. High efficiency drift eliminators will help to minimize emissions from the WSACs. The WSACs are exempt from GBUAPCD permit requirements per District Rule 201.D.4 (exempting "[w]ater cooling towers…not used for evaporative cooling of process water…").

Deleted: 400

Oil/Water Separators and Evaporators

As discussed in Section 2.0, Project Description, HHSEGS will include small oil/water separators and evaporators at each power block. General plant drains will collect containment area washdown, sample drains, and drainage from facility equipment drains. Water from these areas will be collected in a system of floor drains, hub drains, sumps, and piping and routed to the collection system. Drains that potentially could contain oil or grease will first be routed through the oil/water separators. Water passing through the oil/water separator will be reduced in volume by small thermal evaporators that will operate intermittently, using either solar energy or steam as a source of heat.

The capacity of each oil/water separator will be 50 gallons per minute; however, the expected throughput, based on the water balance, is only 2 gallons per minute at each power block. The oil-water separators are exempt from permitting per District Rule 201.H.4 (exempting "containers, reservoirs or tanks used exclusively for: … unheated storage of organic materials with an initial boiling point of 300 F or greater.")

5.1.4.2 Facility Operations

The auxiliary boilers will be operated each morning to warm the main steam systems before solar energy is available to the solar boilers. They will remain on warm standby for the rest of the day (with occasional low-load firing to maintain warm standby status). During cloudy days or in case of emergency shutdown of the solar boilers, the auxiliary boilers may operate to keep the solar boiler system hot and facilitate plant restart. The boilers may also operate for several hours each afternoon/evening to augment solar operation as solar energy diminishes. The auxiliary boilers will also undergo occasional cold startups after extended periods of non-operation (more than 36 hours). Daily maximum impacts from boiler operations were calculated assuming that each boiler would be fired up to 5 equivalent full load hours and up to 7.5 hours at low (startup) load on any given day.

The nighttime preservation boilers will operate during the nighttime hours (12 hours per day during the summer months, up to 16 hours per day during the winter months) to maintain system temperatures overnight.

Maximum annual auxiliary boiler use will be the equivalent of 1,208 full-load hours per year per boiler; maximum annual nighttime boiler operation will be the equivalent of 5,003 full-load hours per year per boiler. The annual operating schedule is summarized in Table 5.1B-8R, Appendix 5.1B.

Boiler heat inputs, as summarized in Table 5.1-15R, correspond to the proposed individual unit emission limits. The natural gas fuel use limits that are proposed as permit conditions correspond to the operating schedule described above and are shown in bold in Table 5.1-20R: hourly heat input to each unit, total combined daily heat input to all units at both plants, and total combined annual heat input to both plants.

Emission rates and operating parameters for the boilers are shown in Appendix 5.1B, Tables 5.1B-1R, B-2R and B-3R. Emission rates and operating parameters for the emergency engines are shown in Appendix 5.1B, Tables 5.1B-4R and B-5R. Emission rates and operating parameters for the fire pump engines are shown in Appendix 5.1B, Tables 5.1B-6R and B-7R. Daily and annual fuel use calculations are shown in Appendix 5.1B, Table 5.1B-9R.

Deleted: The auxiliary boilers will be operated mainly on weekdays during the peak summer months (June through September) to augment the solar operation when solar energy diminishes or during transient cloudy conditions when solar insolation alone is not sufficient to generate adequate steam for the steam turbines. The auxiliary boilers will be started each summer weekday at about 2:30 p.m. and heated up using intermittent gas burner firing. At about 3:00 p.m. the boilers will start to generate steam and the load will be increased at a rate dictated by the boiler manufacturer. The auxiliary boilers are expected to reach full capacity by 6:00 p.m. and will continue to operate at full load for several hours. In this operating mode, all three boilers at a plant would be started, loaded, and operated in the same manner. On cloudy days, the auxiliary boilers may operate independently, depending on steam requirements, and may operate more hours at different loads. One auxiliary boiler at each power block would be maintained on hot standby mode (with very low heat input to maintain full pressure and minimum steam flow), while the other boilers would be on warm standby (in which a boiler is periodically started and held at low fire until it returns to the warm standby temperature). NOx emissions from the auxiliary boilers will be continuously monitored to ensure that daily NOx emissions remain below 230 pounds per day. The auxiliary boilers are not expected to operate between October and May. Maximum annual auxiliary boiler use will be the equivalent of 400 full-load hours per year per boiler. Heat input from natural gas will be limited to below 10 percent of the heat input from the sun, on an annual basis.¶

Deleted: startup

Deleted: up to two hours per day in the

Deleted: startup

Deleted: be used

Deleted: to

Deleted: 2

Deleted: at full load

Deleted: 8 to 10

Deleted: 2

Deleted: startup

Deleted: 800

Deleted: 4,000

Deleted: Table 5.1-15

Deleted: Table 5.1-20

TABLE 5.1-20R
Maximum Facility Natural Gas Fuel Use, Boilers (MMBtu)

Period	Auxiliary Boilers	Nighttime Preservation Boilers	Total Fuel Use (all boilers)
Per Hour (each unit)	**249**	**15**	528.0
Per Day (total, all units)	2,960	480	**3,440**
Per Year (total, all units)	601,700	144,700	**746,400**

Bold text indicates the natural gas fuel use limits that are proposed as permit conditions.

Emergency engines will be tested to ensure that they will function when needed. In order to provide maximum flexibility, it was assumed that each engine would use the 50 hours of testing allowed under the state stationary engine Airborne Toxics Control Measure (ATCM) plus an additional 150 hours per year of emergency operation.[5] It was also assumed that as a worst case, all engines would be tested at any given time. The engines would not be tested on days when the auxiliary boilers are operating. Combined annual fuel use in all engines, shown in bold in Table 5.1-21R, will be limited by permit condition.

TABLE 5.1-21R
Maximum Facility Diesel Fuel Use, Engines (MMBtu)

Period	Power Block Emergency Engines	Common Area Emergency Engine	Power Block Fire Pump Engines	Common Area Fire Pump Engine	Total Fuel Use (all engines)
Per Hour (each unit)*	11.9	1.4	0.8	0.8	27.6
Per Day (total, all units)	23.8	1.4	1.6	0.8	27.6
Per Year (total, all units)	9,520	550	660	330	**11,100**

*Based on 30-minute test operations.

As discussed above, the main process steam will be cooled using a dry cooling system. A PDCS will be used in each power block for auxiliary system cooling, including but not limited to lube and seal oil cooling for major equipment, and chemical feed system cooling requirements. Only the WSAC portion of the cooling system will have air emissions, and that portion of the cooling system is expected to operate only under high ambient temperature conditions.

5.1.4.3 Emissions Calculations

This section presents calculations of emissions increases from the proposed new boilers and engines. Tables containing the detailed calculations are included in Appendix 5.1B.

Deleted: **Startup**
Deleted: **Auxiliary Boilers**
Deleted: **500**
Deleted: **12.25**
Deleted: 3,522.5
Deleted: 21,000
Deleted: 996
Deleted: 294
Deleted: **22,290**
Deleted: 1,200,000
Deleted: 398,400
Deleted: 97,976
Deleted: **1,696,376**
Deleted: Table 5.1-21

Deleted: 3
Deleted: 1.0
Deleted: 7
Deleted: 3
Deleted: 1.9
Deleted: 7
Deleted: 528
Deleted: 53
Deleted: 381
Deleted: **11,081**

---

[5] For criteria pollutant emissions calculations, operations under emergency conditions are not included because those hours are not limited by the ATCM. However, for the calculation of greenhouse gas emissions, emergency operations must be included and emissions must be calculated based on total potential to emit. See Section 5.1.4.3.5, Greenhouse Gas Emissions.

5.1.4.3.1 Criteria Pollutant Emissions: Combustion Equipment

The boilers, emergency engines, and diesel fire pump engine emission rates have been calculated from vendor data, project design criteria, and established emission calculation procedures. The emission rates for the boilers are shown in the following tables. The emission rates for the diesel emergency and fire pump engines are shown in Tables 5.1B-4R through 5.1B-7R of Appendix 5.1B.

Boiler Emissions during Normal Operations. Emissions of NOx, CO, and VOC were calculated from emission limits (in ppmv @ 3% O_2) and the exhaust flow rates. The NOx emission limit reflects the use of low-NOx burners and flue gas recirculation. SOx emissions were calculated from the heat input (in MMBtu) and a SOx emission factor (in lb/MMBtu). The SOx emission factor of 0.0021 lb/MMBtu was derived from the maximum allowable (i.e., CPUC-approved tariff limit) fuel sulfur content of 0.75 grains per 100 standard cubic feet (gr/100 scf). Maximum emissions are based on the highest heat input rates shown in Table 5.1-15R.

The VOC and CO emission limits reflect the use of good combustion practices. SOx, PM_{10}, and $PM_{2.5}$ emission rates are based on the use of natural gas as the fuel and good combustion practices.

Maximum hourly PM_{10} emissions are based on design specifications. $PM_{2.5}$ emissions were determined based on the assumption that all boiler exhaust particulate is less than 2.5 microns in diameter.

Emissions for the boilers are summarized in Table 5.1-22R. The boilers are expected to have a 4:1 turndown ratio. Full-load emission rates will be achieved throughout the turndown range. Emissions during other activities are discussed in more detail below.

TABLE 5.1-22R
Maximum Hourly Emission Rates: Boilers, Normal Operations

Pollutant	ppmvd @ 3% O_2	lb/MMBtu	lb/hr
Auxiliary Boilers (each)			
NOx	9.0	0.011	2.74
SO_2*	1.7	0.002	0.52
CO	25	0.018	4.55
VOC	12.6	0.0053	1.34
$PM_{10}/PM_{2.5}$	n/a	0.005	1.25
Nighttime Preservation Boilers (each)			

Deleted: Table 5.1-15

Deleted: Table 5.1-22

Deleted: auxiliary and startup

Deleted: ; the nighttime preservation boilers are expected to have a 5:1 turndown ratio

Deleted: **Auxiliary Boilers (each)**

Deleted: NOx

Deleted: 9.0

Deleted: 0.011

Deleted: 5.4

Deleted: SO_2*

Deleted: 1.7

Deleted: 0.002

Deleted: 1.1

Deleted: CO

Deleted: 50

Deleted: 0.037

Deleted: 18.3

Deleted: VOC

Deleted: 12.6

Deleted: 0.0053

Deleted: 2.6

Deleted: $PM_{10}/PM_{2.5}$

Deleted: n/a

Deleted: 0.005

Deleted: 2.5

Deleted: **Startup**

Deleted: 6

NOx	9.0	0.011	0.17
SO_2*	1.7	0.002	0.03
CO	50	0.037	0.55
VOC	12.6	0.0053	0.08
$PM_{10}/PM_{2.5}$	n/a	0.005	0.08

*Based on maximum natural gas sulfur content of 0.75 grains/100 scf.

Auxiliary Boiler Emissions During Warm Standby. The auxiliary boilers will operate periodically throughout the day to supply steam: in the morning for system startup, during occasional cloudy conditions, and in the late afternoon and early evening hours. When the auxiliary boilers are not supplying steam, they will be kept in warm standby mode to allow them to ramp up to operating pressure within about 30 minutes. In warm standby, a boiler is periodically started and held at low fire until it returns to a preset warm standby temperature. Because of the extremely low heat input experienced during these short warming periods, combustion is less efficient and NOx, VOC, CO, and PM_{10} emission concentrations are elevated. However, hourly mass emission rates during these warming periods will not be higher than full load mass emission rates because of the extremely low heat input rate. Hourly emission rates for the auxiliary boilers during intermittent firing to maintain warm standby will be the same as hourly mass emission rates during boiler startup, described below.

TABLE 5.1-23 DELETED

Boiler Emissions During Startup/Shutdown. On typical operating days, the auxiliary boilers will undergo periodic startups (as discussed above) to maintain warm standby temperatures, up to a total of approximately 2.5 hours per day. The auxiliary boilers may require up to 5 hours to achieve permitted emission limits (at 25 percent load) after an extended period of shutdown (cold start). Because the auxiliary boilers will operate year-round, cold startups of these boilers would be expected to occur about every 4 weeks, or approximately 15 times per year. The nighttime preservation boilers are expected to require only 1 hour of startup operation daily. Emissions during startup of each boiler were calculated assuming an average heat input rate over the startup period equivalent to half the minimum load (12.5 percent of maximum hourly heat input). Expected hourly emissions

Deleted: 3

Deleted: 0.45

Deleted: 10

Deleted: 0.004

Deleted: 0.05

Deleted: 0.06

Deleted: **Hot/...arm Standby.** The auxiliary b ... [1]

Deleted: Maximum Hourly Emission Rates: AuxiliaryBoilers, Hot/Warm Standby Operations

Deleted: **Pollutant**

Deleted: **ppmvd @ 3% O_2**

Deleted: **lb/MMBtu**

Deleted: **lb/hr**

Deleted: **Auxiliary Boilers (each)**

Deleted: NOx

Deleted: 100

Deleted: 0.12

Deleted: 3.0

Deleted: SO_2*

Deleted: 1.7

Deleted: 0.002

Deleted: 0.05

Deleted: CO

Deleted: 250

Deleted: 0.18

Deleted: 4.6

Deleted: VOC

Deleted: 25

Deleted: 0.0105

Deleted: 0.3

Deleted: $PM_{10}/PM_{2.5}$

Deleted: n/a

Deleted: 0.01

Deleted: 0.25

Deleted: *Based on maximum natural gas sulfur content of 0.75 grains/100 scf.

Deleted: 6 ... hours to achieve permitted emis ... [2]

during a cold startup of the auxiliary boilers are shown in Table 5.1-24R; startup emissions for the nighttime preservation boilers are shown in Table 5.1-25R.

TABLE 5.1-24R
Maximum Hourly Emission Rates: Auxiliary Boilers, Startup Operations

Pollutant	lb/hr
NOx	2.74
SO_2^{a}	0.07
CO	4.55
VOC	1.34
$PM_{10}/PM_{2.5}$	0.31

*Based on maximum natural gas sulfur content of 0.75 grains/100 scf.

TABLE 5.1-25R
Maximum Hourly Emission Rates: Nighttime Preservation Boilers, Startup Operations

Pollutant	lb/hr
NOx	0.17
SO_2*	0.004
CO	0.55
VOC	0.08
$PM_{10}/PM_{2.5}$	0.02

*Based on maximum natural gas sulfur content of 0.75 grains/100 scf.

Hourly mass emissions during startup of the auxiliary and nighttime preservation boilers will not be higher than hourly emissions during normal operation.

Similarly, during routine daily startups, emissions concentrations may be higher than those shown for normal operations in Table 5.1-22R until each boiler reaches its minimum compliant load (25 percent of rated load). However, because of the low heat input rates, the boilers are expected to comply with the pound per hour emission rates on a 3-hour average basis during all startups.

Boiler Operations During Commissioning Activities. During plant commissioning, emission concentrations will be elevated during the first several days of operation of each boiler as it is started up and held at low loads for tuning. However, as discussed above for startup emissions, hourly mass emissions during commissioning activities are not expected to be higher than the pound per hour emission rates for normal operations. Expected emissions during boiler commissioning activities are shown in Table 5.1B-18R, Appendix 5.1B. Only one boiler at a time will be undergoing commissioning activities.

Deleted: and startup …oilers are shown ... [3]
Deleted: Emissions were calculated assu ... [4]
Deleted: and Startup
Deleted: **Startup Boiler**
Deleted: **ppmvd @ 3% O_2**
Deleted: **lb/MMBtu**
Deleted: **Auxiliary Boiler** ... [5]
Deleted: 75
Deleted: 0.09
Deleted: 5.6
Deleted: 2.8
Deleted: 1.7
Deleted: 0.002
Deleted: 0.13
Deleted: 300
Deleted: 0.22
Deleted: 13.7
Deleted: 6.8
Deleted: 60
Deleted: 0.025
Deleted: 1.6
Deleted: 0.8
Deleted: n/a
Deleted: 0.01
Deleted: 0.63
Deleted: **ppmvd @ 3% O_2**
Deleted: **lb/MMBtu**
Deleted: 70
Deleted: 0.084
Deleted: 0.13
Deleted: 1.7
Deleted: 0.002
Deleted: 0.003
Deleted: 275
Deleted: 0.20
Deleted: 0.31
Deleted: 55
Deleted: 0.023
Deleted: 0.04
Deleted: n/a
Deleted: 0.01
Deleted: NOx …ass emissions during co ... [6]
Deleted: D…uring routine daily startup ... [7]

5.1.4.3.2 Criteria Pollutant Emissions: Wet Surface Air Coolers

The dry cooling portion of the PDCS has no air emissions. The wet portion of each cooling system emits only water vapor and will be equipped with a 4,000-gpm WSAC. Particulate emissions result from evaporation of the cooling water that drifts from the fluid cooler.

Deleted: 3,276

Deionized water will be used for makeup water. As a result, the TDS level of the recirculating water will still be relatively low (<1500 ppmw) even after 20 cycles of concentration.

Deleted: very

Deleted: 400

Details of the cooling water drift calculation for the WSACs are shown in Appendix 5.1B, Table 5.1B-10R. Particulate emissions from each cooling system will be about 66 pounds per year.

5.1.4.3.3 Criteria Pollutant Emissions: Mirror Cleaning

Mirror washing will employ a high-pressure system using demineralized water, by means of vehicles that carry a water tank, positive displacement water pumps that deliver water at high-pressure, and spray nozzles operated by the cleaning crew. The washing is expected to be done on a 2-week rotating cycle. The water washing will be supplemented with brushing, which will be done on an 8-week schedule.

Deleted: -towed trailer

Deleted: contain

Each solar field is divided into two zones for the purpose of heliostat cleaning, depending upon the locations and density of heliostat placement. These zones determine what type of mirror washing machine can be used for the heliostats in the zone. The Near Tower (NT) Zone consists of the area closest to the tower. The layout in this zone allows a vehicle to drive between the heliostats so that each heliostat can be accessed directly. The NT mirror washing machines are small and maneuverable. Each solar plant will require one NT mirror washing machine. The NT mirror washing machines will be equipped with certified non-road engines.

Deleted: three

Deleted: Zone

Deleted: Z

Deleted: Z

Deleted: four

Deleted: Z

Deleted: s

Heliostats beyond the NT Zone (the Far From Tower, or FFT, Zone) cannot be accessed directly and must be reached with a crane. The heliostats that are more than about 400 meters from the tower will be cleaned using vehicles with telescoping arms that can reach the heliostats from the limited areas in which the vehicles can drive. Each FFT machine will drive a short distance, park and anchor, and then extend its crane arm to clean as many heliostats as can be reached from its location. Each solar plant will require a total of 7 machines for cleaning heliostats in the FFT zone. The FFT mirror washing machines will be equipped with heavy-duty on-road engines.

Deleted: tractor-towed trailer

Deleted: 17 tractor-pulled trailers

Deleted: outside the NTZ

Two components contribute to emissions from site maintenance activities: combustion emissions from vehicles, and fugitive dust from driving over unpaved surfaces. Calculations of emissions from mirror cleaning activities are shown in Table 5.1B-11R and are summarized in Table 5.1-26R.

Deleted: Table 5.1-26

TABLE 5.1-26R
Emissions from Mirror Cleaning Activities (Total, Both Plants)

	Pollutant						
	Combustion Emissions					Fugitive Dust	
	NOx	SO$_2$	CO	VOC	PM$_{10}$/PM$_{2.5}$*	PM$_{10}$	PM$_{2.5}$
Hourly, lb/hr	0.2	0.06	0.01	0.01	0.01	1.7	0.2
Daily, lb/day	4.1	1.1	1.6	1.9	0.1	34.6	3.5
Annual, ton/yr	0.7	0.2	0.03	0.3	0.02	6.3	0.6

* All combustion PM emissions are assumed to be Diesel Particulate Matter (DPM).

5.1.4.3.4 Criteria Pollutant Emissions: Plant Operation

The calculation of maximum facility emissions shown in Table 5.1-27R is based on the boiler emission rates shown in Table 5.1-22R, the fuel use limitations in Table 5.1-20R, and the following assumptions:

- Although the auxiliary and nighttime preservation boilers are unlikely to be operated at the same time, a worst-case assumption is that boiler operations occur simultaneously during the worst-case hour.
- Each engine may be operated for maintenance and testing for up to 30 minutes on a single day and up to 50 hours per year. Although it is highly unlikely that all engines will be tested at the same time, the analysis of maximum hourly emissions during emergency engine testing assumes that all of the engines may be tested at the same time.
- Maximum daily emissions were calculated assuming that both auxiliary boilers will be in cold startup at the same time. The auxiliary boilers may undergo a cold startup when the nighttime preservation boilers are in operation.

Hourly, daily, and annual emissions from the new facility are shown in Appendix 5.1B, Table 5.1B-12R. The maximum hourly, daily, and annual emissions, summarized in Table 5.1-27R, are used in the air dispersion modeling to calculate the maximum potential ground-level concentrations contributed by the project to the ambient air.

TABLE 5.1-27R
Maximum Emissions from New Equipment

	Pollutant				
Emissions/Equipment	**NOx**	**SO$_2$**	**CO**	**VOC**	**PM$_{10}$/PM$_{2.5}$**
Maximum Hourly Emissions					
Boilers	5.8	1.1	10.2	2.8	2.6
Emergency Engines	39.8	0.04	22.0	1.4	1.3
Diesel Fire Pump Engines	2.0	<0.01	1.7	0.1	0.1
WSACs	—	—	—	—	<0.01
Total, pounds per hour	**47.6**	**1.2**	**33.9**	**4.4**	**4.0**

Deleted: 2.5
Deleted: **DPM***
Deleted: 7.1
Deleted: 0.13
Deleted: 2.1
Deleted: 3.4
Deleted: 1.4
Deleted: 0.4
Deleted: 74.9
Deleted: 1.3
Deleted: 22.0
Deleted: 35.6
Deleted: 14.7
Deleted: 3.7
Deleted: 2.5
Deleted: 13.7
Deleted: 0.24
Deleted: 4.0
Deleted: 6.5
Deleted: 2.7
Deleted: 0.7
Deleted: 0.5
Deleted: DPM:
Deleted: Table 5.1-27Table 5.1-27…R is ... [8]
Deleted: , startup
Deleted: Engines will not be tested on ... [9]
Deleted: Mirror cleaning will occur at ... [10]
Deleted: ^{a}
Deleted: 38.1
Deleted: 7.4
Deleted: 119.7
Deleted: 18.6
Deleted: 17.6
Deleted: 41.6
Deleted: 5.9
Deleted: 1.0
Deleted: 0.4
Deleted: 1.9
Deleted: 1.2
Deleted: **43.5**
Deleted: **7.4**
Deleted: **119.7**
Deleted: **18.6**
Deleted: **17.6**

TABLE 5.1-27R
Maximum Emissions from New Equipment

	Pollutant				
Emissions/Equipment	**NOx**	**SO_2**	**CO**	**VOC**	**$PM_{10}/PM_{2.5}$**
Maximum Daily Emissions[a]					
Boilers	74.3	7.4	132.5	36.2	19.6
Emergency Engines	39.8	0.04	22.0	1.4	1.3
Diesel Fire Pump Engines	2.0	<0.01	1.7	0.1	0.1
WSACs	—	—	—	—	0.4
Total, pounds per day	**116.0**	**7.4**	**156.1**	**37.8**	**21.3**
Maximum Annual Emissions					
Boilers	6.3	0.8	11.8	3.0	2.0
Emergency Engines	2.0	<0.01	1.1	0.07	0.06
Diesel Fire Pump Engines	0.1	<0.01	0.1	0.01	<0.01
WSACs	—	—	—	—	0.03
Total, tons per year	**8.3**	**0.8**	**12.9**	**3.1**	**2.1**

[a] Maximum daily emissions occur on a day when the auxiliary boilers undergo cold startup.

5.1.4.3.5 Greenhouse Gas Emissions

Direct emissions of GHGs from the project are presented in Table 5.1-28R. Carbon dioxide, nitrous oxide, and methane emissions are based on default emission factors for boilers and reciprocating internal combustion engines in the California Air Resources Board GHG Reporting Regulation.[6] The estimated emissions include sulfur hexafluoride leakage emissions from four circuit breakers at the switchyard and one generator circuit breaker at each power block. Emissions of methane, nitrous oxide, and sulfur hexafluoride have been converted to carbon dioxide equivalents using GHG warming potentials of 21, 310, and 23,900, respectively.

When calculating criteria pollutant emissions from the emergency generators, only the allowable hours per year of operation for testing and maintenance are used to determine maximum annual emissions; emergency use is not considered.[7] However, EPA guidance for determining potential to emit from emergency engines requires the inclusion of all operations: "EPA has no policy that specifically requires exclusion of 'emergency'… emissions." [8] In the absence of any permit limitation on annual emissions, EPA "believes that 500 hours is an appropriate default assumption for estimating the number of hours that an emergency generator could be expected to operate under worst-case conditions."[9] Therefore, in the absence of any limiting permit condition, the calculation of PTE for GHG would have to assume that each emergency engine and fire pump engine will operate for

---

[6] CARB, *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, Appendix A*, December 2007

[7] CARB, *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled* Engines, October 2000; Footnote 3 to Table 1, Permitting Requirements for New Stationary Diesel-Fueled Engines ("The annual hours of operation for emergency standby engines include the hours of operation for maintenance and testing runs only.")

[8] USEPA, Letter from Steven C. Riva, Chief, Permitting Section, Air Programs Branch, to William O'Sullivan, Director, Division of Air Quality, New Jersey Department of Environmental Protection, February 14, 2006.

[9] USEPA, Memorandum from John S. Seitz, Director, OAQPS, to Regional Directors, re: "Calculating Potential to Emit (PTE) for Emergency Generators," September 6, 1995.

Deleted: [b]
Deleted: 242.6
Deleted: 35.6
Deleted: 738.4
Deleted: 104.1
Deleted: 88.5
Deleted: 41.6
Deleted: 5.9
Deleted: 1.0
Deleted: 0.4
Deleted: 1.9
Deleted: 1.2
Deleted: 1
Deleted: **242.6**
Deleted: **35.6**
Deleted: **738.4**
Deleted: **104.1**
Deleted: **88.5**
Deleted: 10.2
Deleted: 1.8
Deleted: 29.8
Deleted: 4.7
Deleted: 4.4
Deleted: 1
Deleted: 0.3
Deleted: 5
Deleted: 2
Deleted: 1
Deleted: **12.3**
Deleted: **1.8**
Deleted: **30.2**
Deleted: **4.8**
Deleted: **4.4**
Deleted: [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.¶
Deleted: [b]
Deleted: Engine testing will occur only on days when the auxiliary boilers do not operate (see Table 5.1B-12, Appendix B).
Deleted: Table 5.1-28

500 hours per year. The Applicant believes that operation of the emergency equipment will in fact not exceed 200 hours per year and is proposing an annual combined fuel use limit, equivalent to 200 hours per year of full-load operation of each unit, that will limit the GHG potential to emit for the emergency units and ensure that GHG emissions from the facility will be less than 100,000 tpy.

TABLE 5.1-28R
Annual Emissions Of Greenhouse Gases

Pollutant	Emissions (metric ton/year)	CO_2 Equivalent (metric ton/yr)	CO_2 Equivalent (tons/yr)
CO_2	40,392	40,392	—
Nitrous Oxide	0.8	16.4	—
Methane	0.08	25.2	—
SF_6	$2.0x10^{-3}$	47.8	—
Total	—	**40,392**	**44,530**

Deleted: 90,501
Deleted: 90,501
Deleted: 1.6
Deleted: 32.8
Deleted: 0.2
Deleted: 54.7
Deleted: 90.4
Deleted: **90,501**
Deleted: **99,700**

5.1.4.3.6 Evaluation of Potential PSD Applicability

For the purposes of determining applicability of the PSD program requirements, the following regulatory procedure is used. Project emissions are compared with regulatory significance thresholds to determine whether the facility is major and thus may be subject to PSD review. If the facility emissions exceed these thresholds, it is a major facility. Because the HHSEGS project includes one of the 28 listed source categories with 100 ton per year PSD major source thresholds,[10] fugitive emissions are required to be included in calculating the facility's potential to emit. Therefore, fugitive dust emissions from mirror cleaning activities are included here.[11] The comparison in Table 5.1-29R indicates that the project would not be a major source because its emissions of all pollutants are below the applicable major source thresholds.

Deleted: Table 5.1-29

TABLE 5.1-29R
Comparison of Project Emissions With PSD Major Source Thresholds

Pollutant	Maximum Annual Project Emissions (tpy)	PSD Major Source Threshold (tpy)	Is Facility a Major Source?
NO_2	8.3	100	No
SO_2	0.8	100	No
CO	12.9	100	No
VOC	3.1	100	No
PM_{10}	8.4	100	No
$PM_{2.5}$	2.7	100	No

Deleted: 12.3
Deleted: 1.8
Deleted: 30.2
Deleted: 4.8
Deleted: 4.4
Deleted: 4.4

---

[10] The HHSEGS project includes fossil fuel-fired boilers totaling more than 250 million Btu/hr heat input.
[11] See Appendix 5.1B, Table 5.1B-11R.

TABLE 5.1-29R
Comparison of Project Emissions With PSD Major Source Thresholds

CO_2e	44,530	100,000	No

Deleted: 99,700

5.1.4.3.7 Non-Criteria Pollutant Emissions

Maximum hourly and annual noncriteria pollutant (toxic air contaminant, or TAC) emissions were estimated for the proposed boilers, emergency generators, emergency fire pumps, and partial dry cooling systems (WSACs). Maximum proposed TAC emissions for the boilers are shown in Table 5.1-30R, and were calculated from the heat input rates (in MMBtu/hr and MMBtu/yr) shown in Table 5.1-20R and Table 5.1-21R, EPA emission factors (in lb/MMscf), and the nominal higher heating value for the natural gas of 1020 Btu/scf.

Deleted: Table 5.1-30

Deleted: Table 5.1-20

Deleted: Table 5.1-21

Because diesel particulate matter is regulated by the State of California as a TAC, all of the PM_{10} emissions from the diesel emergency engines and diesel fire pump engines are also included. (These are shown in Table 5.1-18R, with supporting calculations shown in Appendix 5.1B, Tables 5.1B-4R through B-7R.) The ambient impact of these non-criteria pollutant emissions is determined by the potential health risks calculated in the screening health risk assessment (see Section 5.1.6.4).

Detailed calculations of the TAC emissions from the facility are shown in Appendix 5.1B, Tables 5.1B-15R and 5.1B-16R. TAC emissions from the WSACs are negligible, as shown in Table 5.1B-17R of Appendix 5.1B.

As emissions of each individual federally-regulated hazardous air pollutant (HAP) are below 10 tons per year and total HAP emissions are below 25 tons per year, the project is an area source of HAPs. Compliance with the applicable area source NESHAPs is discussed in Section 5.1.6.1.

TABLE 5.1-30R
Summary of Toxic Air Contaminant Emissions from Project Operation

Compound	Maximum Proposed Emissions (total, all units)	
	lb/hr	tpy
Boilers[a]		
Acetaldehyde	5.3x10^{-4}	4.9x10^{-4}
Acrolein	4.7x10^{-4}	4.3x10^{-4}
Benzene	1.0x10^{-3}	9.1x10^{-4}
Ethylbenzene	1.2x10^{-3}	1.1x10^{-3}
Formaldehyde	2.1x10^{-3}	1.9x10^{-3}
Hexane	7.7x10^{-4}	7.1x10^{-4}
Naphthalene	1.6x10^{-5}	1.1x10^{-4}
Polycyclic Aromatics	5.2x10^{-4}	3.7x10^{-5}
Propylene	6.6x10^{-2}	4.2x10^{-2}
Toluene	4.6x10^{-3}	4.2x10^{-3}
Xylene	3.4x10^{-3}	3.1x10^{-3}
Emergency Engines[b]		
Diesel Particulate Matter	1.3	6.3x10^{-2}
Fire Pump Engines[b]		
Diesel Particulate Matter	0.1	5.0x10^{-3}
Mirror Cleaning		
Diesel Particulate Matter	2.5	0.02
Total HAPs[c]		1.3 x10^{-2}

[a] Emission factors obtained from Ventura County APCD. See Tables 5.1B-14R through B-16R.

[b] All PM_{10} emissions from Diesel engines are TACs.

[c] Propylene and Diesel Particulate Matter are not HAPs.

5.1.4.3.8 Construction Emissions: Project Construction

There are two types of construction emissions: combustion emissions and fugitive dust. Combustion emissions come from the workers' vehicles, from heavy equipment (both stationary and mobile), and from delivery vehicles. Fugitive dust comes from moving, disturbing, and traveling over the work site and roads and from windblown dust sources. Other activities that create dust include scraping and grading of the site, earth moving, and the movement of various construction vehicles around the site. A concrete batch plant will also be operated for about 12 months of the 29-month construction period. Although emissions from the batch plant will be minimized by powering the equipment with electric power instead of diesel-powered generators, the storage piles and transfer activities will be a potential source of fugitive dust.

The construction schedule is broken down into several activities: mobilization, during which the sites are set up to support the equipment and workers that will be on the site; clear and grub and road construction, during which vegetation is removed from the

Deleted: 3.2
Deleted: ^{3}
Deleted: 8.5
Deleted: 2.8
Deleted: ^{3}
Deleted: 7.6
Deleted: 6
Deleted: 1.6
Deleted: ^{3}
Deleted: 7.0
Deleted: 9
Deleted: 1.3
Deleted: ^{2}
Deleted: 3.4
Deleted: 4.6
Deleted: ^{3}
Deleted: 1.2
Deleted: ^{3}
Deleted: 0
Deleted: ^{3}
Deleted: 2.5
Deleted: 3.5
Deleted: 8.3
Deleted: 3.8
Deleted: 2.7
Deleted: ^{2}
Deleted: 7.4
Deleted: 2.0
Deleted: ^{2}
Deleted: 5.5
Deleted: ^{2}
Deleted: 0.43
Deleted: 2.0
Deleted: 3
Deleted: ^{c}
Deleted: 0.5
Deleted: ^{d}
Deleted: 2.3
Deleted: ^{c} From Table 5.1-26.¶
Deleted: ^{d}

heliostat fields, the terrain is smoothed (not, however, graded, except for the power block areas), and plant and heliostat field access roads are constructed; heliostat erection; and power block, tower, and dry cooling system (air-cooled condenser) erection. Commissioning and testing will begin at the end of the construction period, when heliostat erection and power block construction are complete. Estimated land disturbance for major construction activities is summarized in Section 2.0, Project Description.

Construction equipment and vehicle exhaust emissions were estimated using equipment lists and construction scheduling information provided by the project design engineering firm, which are presented in Section 2.0, Project Description, and Appendix 5.1F. CARB's OFFROAD2010 and EMFAC2007 models were used to generate equipment-specific emission factors for all criteria pollutants for diesel-fueled construction equipment and for on-road vehicles, respectively. Assumptions used in calculating project construction emissions included a 29-month construction period with 40 hours per week of construction activity. Double-shift work schedules will be used during solar field assembly and installation activities and construction activities will continue around the clock when concrete is poured for the solar towers. A single-shift, 8- to 10-hour workday will be used for the remainder of the construction activities. The list of fueled equipment needed during each month of the construction effort (see Attachment 5.1F-1, Appendix 5.1F) served as the basis for estimating pollutant emissions throughout the term of construction and helped to identify the periods of probable maximum short-term emissions.

Fugitive dust emissions resulting from onsite soil disturbances were estimated using EPA AP-42 emission factors for activities including bulldozing and dirt-pushing, travel on paved and unpaved roads, material handling, and wind erosion to storage of aggregate materials. The mitigation measures of frequent watering and limiting speeds to 15 miles per hour were assumed to achieve a combined dust control efficiency of 85 percent for traveling on unpaved surfaces at the project site and temporary construction area activities. Emissions from on-road delivery trucks and worker commute trips were estimated using trip distribution information presented in Table 5.12-7 in Section 5.12 (Traffic and Transportation) and emission factors provided by CARB's EMFAC2007 model. The majority of the construction workers were assumed to commute to the proposed project site from locations in southern Nevada.

The short-term maximum emissions were calculated using Month 8 for construction equipment and Months 8/9[12] for fugitive dust. Activities in Month 8 include solar field assembly and installation, much of which will require double shifts. Annual emissions were based on the worst 12 consecutive months of the construction period, which were Months 6-17 of the 29-month schedule for combustion emissions, and Months 4-15 for fugitive dust.

Detailed construction emissions calculations are provided in Appendix 5.1F. Maximum daily project construction emissions are summarized in Table 5.1-31R. Maximum annual project construction emissions are summarized in Table 5.1-32R.[13]

Deleted: Table 5.1-31

Deleted: Table 5.1-32

---

[12] Months 8 and 9 have equal emissions.

[13] Construction emissions have been revised to reflect the submittal made under BSE's response to Staff's Data Request 8 (Set 1A), filed November 16, 2011. The Boiler Optimization is not expected to result in any changes to the construction schedule or loadings presented and analyzed in the AFC.

TABLE 5.1-31R
Maximum Daily Project Construction Emissions, Pounds Per Day, Month 8 (Combustion), Months 8 and 9 (Fugitive Dust)

	NOx	CO	VOC	SOx	PM$_{10}$	PM$_{2.5}$
Onsite						
Construction Equipment (including batch plant)	384.4	192.3	29.3	0.65	85.9	25.7
Fugitive Dust	—	—	—	—	104.9	12.0
Offsite						
Worker Travel, Truck Deliveries	1,357.8	2,778.0	345.9	1.5	55.4	42.9
Total	1,742	2,970	375	2.2	246	81

Deleted: 349.8
Deleted: 181.2
Deleted: 25.9
Deleted: 86.0
Deleted: 25.8
Deleted: 1,708
Deleted: 2,959
Deleted: 372

TABLE 5.1-32R
Maximum Annual Onsite Construction Emissions, Tons Per Year

	NOx	CO	VOC	SOx	PM10	PM2.5	GHG[a]
Onsite							
Construction Equipment	34.2	17.5	2.62	0.06	3.8	1.7	7,781
Fugitive Dust	—	—	—	—	8.8	1.0	—
Offsite							
Worker Travel, Truck Deliveries	30.9	302.3	32.3	0.01	1.5	1.0	2,308
Total	65.1	320	34.9	0.1	14.1	3.7	10,089

[a] GHG emissions shown as total MT over the 29-month construction period.

Deleted: *
Deleted: 31.2
Deleted: 16.6
Deleted: 2.3
Deleted: 14.1
Deleted: 5
Deleted: 62.2
Deleted: 319
Deleted: 34.5
Deleted: *

5.1.4.4 Emissions and Fuel Use Monitoring

The fuel flow rate (in MMscf) and oxygen levels for each of the boilers will be monitored continuously and permanently recorded.

Deleted: The auxiliary boilers will be equipped with continuous emissions monitoring systems (CEMS) to measure and record emissions of NOx and oxygen, as required under 40 CFR Parts 60 and 75.

The auxiliary boilers are subject to acid rain requirements; however, because of their low emissions, they are eligible to use the low mass emissions (LME) methodology of 40 CFR §75.19 and will not be required to use acid rain continuous emissions monitoring systems (CEMS). This section provides an alternative monitoring methodology that may be used instead of CEMS for gas-fired units that have very low mass emissions.

Operating hours and fuel use will also be monitored and recorded for each of the emergency diesel engines and fire pump engines.

5.1.4.5 Air Quality Impact Analysis

The air quality impact analysis for the project evaluates the emissions presented above in ambient air dispersion modeling and health risk assessments. These analyses are presented in this section.

5.1.4.5.1 Air Quality Modeling Methodology

An assessment of impacts from the project on ambient air quality was conducted using EPA-approved air quality dispersion models. These models use a mathematical description of atmospheric dispersion to simulate the actual processes by which emissions are transported to potential ground-level impact areas. A detailed description of the methodology is provided in the Ambient Air Quality Modeling Protocol and follow-up correspondence with the CEC staff, which are included as Appendix 5.1H.

Using conservative assumptions, dispersion modeling was used to determine the maximum ground-level impacts of the project. The results were compared with state and federal ambient air quality standards. If the standards are not exceeded in the analysis, then the facility will cause no exceedances under any operating or ambient conditions, at any location, under any meteorological conditions. In accordance with the air quality impact analysis guidelines developed by EPA[14] and CARB[15], the ground-level impact analysis includes the following assessments:

- Impacts in simple, intermediate, and complex terrain;
- Aerodynamic effects (downwash) due to nearby building(s) and structures; and
- Impacts from inversion breakup (fumigation).

Simple, intermediate, and complex terrain impacts were assessed for all meteorological conditions that would limit the amount of final plume rise. Plume impaction on elevated terrain, such as on the slope of a nearby hill, can cause high ground-level concentrations, especially under stable atmospheric conditions. Another dispersion condition that can cause high ground-level pollutant concentrations is caused by building downwash. Downwash can occur when wind speeds are high and a sufficiently tall building or structure is in close proximity to the emission stack. This can result in building wake effects where the plume is drawn down toward the ground by the lower pressure region that exists in the lee (downwind) side of the building or structure.

Fumigation conditions occur when the plume is emitted into a layer of stable air (inversion) that then becomes unstable from below, resulting in a rapid mixing of pollutants out of the stable layer and towards the ground in the unstable layer underneath. The low mixing height that results from this condition allows little diffusion of the stack plume before it is carried downwind to the ground. Although fumigation conditions are short-term, rarely lasting as long as an hour, relatively high ground-level concentrations may be reached during that period. Fumigation tends to occur under clear skies and light winds, and is more prevalent in summer.

The basic model equation used in this analysis assumes that the concentrations of emissions within a plume can be characterized by a Gaussian distribution about the centerline of the plume. Concentrations at any location downwind of a point source such as a stack can be determined from the following equation:

$$C(x,y,z,H) = \left(\frac{Q}{2\pi\sigma_y\sigma_z u}\right) * \left(e^{-1/2(y/\sigma y)^2}\right) * \left(\left[e^{-1/2(z-H/\sigma_z)^2}\right] + \left\lfloor e^{-1/2(z+H/\sigma_z)^2}\right\rfloor\right)$$

---

[14] EPA. Guideline on Air Quality Models, 40 CFR Part 51, Appendix W.

[15] ARB. Reference Document for California Statewide Modeling Guideline, April 1989.

Where:

C = the concentration in the air of the substance or pollutant in question

Q = the pollutant emission rate

σ_y, σ_z = the horizontal and vertical dispersion coefficients, respectively, at downwind distance x

u = the wind speed at the height of the plume center

x, y, z = the variables that define the 3-dimensional Cartesian coordinate system used; the downwind, crosswind, and vertical distances from the base of the stack

H = the height of the plume above the stack base (the sum of the height of the stack and the vertical distance that the plume rises due to the momentum and/or buoyancy of the plume)

Gaussian dispersion models are approved by EPA for regulatory use and are based on conservative assumptions (i.e., the models tend to over-predict actual impacts by assuming steady-state conditions, no pollutant loss through conservation of mass, no chemical reactions, etc.). The EPA models were used to determine if ambient air quality standards would be exceeded, and whether a more accurate and sophisticated modeling procedure would be warranted to make the impact determination. The following sections describe:

- Model selection
- Refined air quality impact analysis
- Existing ambient pollutant concentrations and preconstruction monitoring
- Results of the ambient air quality modeling analyses

5.1.4.5.2 Model Selection

The air quality impact analyses were performed using the American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee (AERMIC) modeling system, also known as AERMOD (version 11353). The AERMOD modeling system includes a steady-state, multiple-source, Gaussian dispersion model designed for use with stack emission sources situated in terrain where ground elevations can exceed the stack heights of the emission sources (i.e., complex terrain). The model is capable of estimating concentrations for a wide range of averaging times (from 1 hour to 1 year). The AERMOD modeling system includes two preprocessors in addition to the dispersion model itself: AERMET and AERMAP. AERMET is a meteorological preprocessor, while AERMAP is a terrain preprocessor that characterizes terrain and generates receptor grids. Inputs required by the AERMOD modeling system include the following:

Deleted: 11059

- Model options
- Meteorological data
- Source data
- Receptor data

Model options refer to user selections that account for conditions specific to the area being modeled or to the emissions source that needs to be examined. Examples of model options include use of site-specific vertical profiles of wind speed and temperature; consideration of stack and building wake effects; and time-dependent exponential decay of pollutants. The model supplies recommended default options for the user for some of these parameters.

AERMOD uses hourly meteorological data to characterize plume dispersion. The representativeness of the data is dependent on the proximity of the meteorological monitoring site to the area under consideration, the complexity of the terrain, the exposure of the meteorological monitoring site, and the period of time during which the data are collected. The meteorological data set used in this analysis combined surface meteorological data (e.g., wind speed and direction, temperature) from the Pahrump, Nevada, monitoring station, surface data (cloud cover) from Henderson, Nevada, and upper air data from Elko, Nevada.

For the purposes of modeling, a stack height beyond what is required by good engineering practices (GEP) is not allowed (40 CFR Part 60 §51.164). However, this requirement does not place a limit on the actual constructed height of a stack. GEP as used in modeling analyses is the height necessary to ensure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies, or wakes that may be created by the source itself, nearby structures, or nearby terrain obstacles. In addition, the GEP stack height modeling restriction assures that any required regulatory control measure is not compromised by the effect of that portion of the stack that exceeds the GEP height. The EPA guidance ("Guideline for Determination of Good Engineering Practice Stack Height," Revised 6/85) for determining GEP stack height indicates that GEP is the greater of 65 meters or H_g, where H_g is calculated as follows:

$$H_g = H + 1.5L$$

Where:

H_g = Good Engineering Practice stack height, measured from the ground-level elevation at the base of the stack

H = height of nearby structure(s) measured from the ground-level elevation at the base of the stack

L = lesser dimension, height or maximum projected width, of nearby structure(s)

The boiler stack heights, at between 30 and 135 feet, are less than the GEP limit of 65 meters (213 feet). Stack heights therefore do not need to be adjusted for GEP.

Deleted: 90

Deleted: 120

5.1.4.5.3 Receptor Grid Selection and Coverage

Receptor and source base elevations were determined from U.S. Geological Survey (USGS) National Elevation Dataset (NED) data in the GeoTIFF format at a horizontal resolution of 1 arc-second (approximately 30 meters). All coordinates were referenced to UTM North American Datum 1983 (NAD83), Zone 11. The AERMOD receptor elevations were interpolated among the Digital Elevation Map (DEM) nodes according to standard AERMAP procedures. For determining concentrations in elevated terrain, the AERMAP terrain preprocessor receptor-output (ROU) file option was chosen; hills were not imported into AERMOD for CTDM-like processing.

Cartesian coordinate receptor grids were used to provide adequate spatial coverage surrounding the project area for assessing ground-level pollution concentrations, to identify the extent of significant impacts, and to identify maximum impact locations. A 250-meter resolution coarse receptor grid was developed and extended outwards at least 5 km.[16] For the full impact analyses, a nested grid was developed to fully represent the maximum impact area(s). This grid has 25-meter resolution along the facility fence-line in a single tier of receptors composed of four segments extending out to 100 meters from the fence line, 100-meter resolution from 100 meters to 1,000 meters from the fence line, and 250-meter spacing out to 5 km from the fence line. Additional refined receptor grids with 25-meter resolution were placed around the maximum first-high and maximum second-high coarse grid impacts and extended out 500 meters in all directions. Concentrations within the facility fence line were not calculated. The regions imported in Geographical Coordinates for the USGS NED data are bounded as follows:

- Southwest corner: Lat: 35.88, Lon: -116.04
- Northeast corner: Lat: 36.11, Lon: -115.75

The analysis included receptors in California and Nevada.

5.1.4.5.4 Meteorological Data Selection

EPA defines the term "onsite data" to mean data that would be representative of atmospheric dispersion conditions at the source and at locations where the source may have a significant impact on air quality. Representativeness has been defined in the PSD Monitoring Guideline as data that characterize the air quality for the general area in which the proposed project would be constructed and operated. The meteorological data requirement originates in the Clean Air Act at Section 165(e)(1), which requires an analysis "of the ambient air quality at the proposed site and in areas which may be affected by emissions from such facility for each pollutant subject to regulation under [the Act] which will be emitted from such facility."

This requirement and EPA's guidance on the use of onsite monitoring data are also outlined in the On-Site Meteorological Program Guidance for Regulatory Modeling Applications.[17] The representativeness of the data depends on (a) the proximity of the meteorological monitoring site to the area under consideration, (b) the complexity of the topography of the area, (c) the exposure of the meteorological sensors, and (d) the period of time during which the data are collected.

Hourly surface meteorological data (e.g., hourly wind speed and direction and temperature) have been obtained from Pahrump, Nevada, for calendar years 2006 through 2010. Cloud cover data from the Henderson Airport, near Las Vegas, were used as no cloud cover data are collected at the Pahrump station. Upper air data were recorded at Elko, Nevada. The Pahrump, Nevada, monitoring station is 18 miles (28 km) from the project site, and is located in the same valley and at a similar elevation on the same high desert plateau. Therefore, the met data station meets criteria (a), (b), and (c) above. In addition, the use of 5 years of meteorological data ensures adequate representation of temporal variation. Based

---

[16] Although the modeling protocol indicated that the coarse receptor grid would extend up to 10 km from the fence line, the maximum impacts were very close to the project and a larger grid was not needed to identify significant impact areas.

[17] EPA, *Supplement A to the Guideline on Air Quality Models (Revised)*, 1987.

on these considerations, the Applicant believes that the proposed meteorological data are representative of conditions at the project site.

Representativeness is best evaluated when sites are climatologically similar, as are the project site and the Pahrump meteorological monitoring station. The Pahrump meteorological monitoring station is near the HHSEGS site (distance between the two locations is approximately 18 miles with no significant intervening terrain features), and the same large-scale topographic features located to the east and south that influence the meteorological data monitoring station influence the project site in the same manner.

The values for the surface characteristics of albedo, Bowen Ratio, and surface roughness appropriate to the area around the Pahrump meteorological monitoring station have been obtained from AERSURFACE[18], designed to aid in obtaining realistic and reproducible surface characteristic values for AERMET, following EPA guidance. AERSURFACE uses land cover data from the U.S. Geological Survey National Land Cover Data 1992 archives, meaning that the land cover data used to develop surface characteristics for the Pahrump area reflect conditions in 1992, before extensive development took place in the area. The area within one kilometer of the met station, which is used in the AERMOD modeling system to define surface characteristics, has seen some isolated development to the south, the west, and north-northeast. The rest of the area surrounding the met station remains undeveloped. The prevailing winds in the area are from the south through southeast, so only the development to the south would be likely to have any significant influence on meteorological conditions monitored at the station. Because of the sparse distribution and the regular shapes of these buildings, the impacts of these buildings on the monitor are expected to be minimal. Finally, the surface characteristics associated with the Pahrump met data reflect conditions consistent with “shrubland (arid region)” and are in no way similar to residential or commercial surface roughness values. Therefore, the surface characteristics associated with the Pahrump meteorological station data appropriately reflect surface characteristics at the project site.

Upper air meteorological data are taken from soundings obtained at Elko, Nevada, located approximately 335 miles northeast of the project site. The nearest upper air station to the project site is located at Desert Rock, Nevada. For the period 2006 through 2010, however, the upper air data from Desert Rock are incomplete—approximately 15% missing data, which exceeds the 10% EPA data completeness threshold.

The next closest upper air station is at Miramar Naval Air Station, California. However, Miramar is a coastal site, while Elko is an inland desert site and as such is climatologically more similar to the project site.

5.1.4.5.5 Ambient Background Data Selection

Background ambient air quality data for the project area from the monitoring site most representative of the conditions that exist at the HHSEGS site were used to represent regional background concentrations. Table 5.1-33 shows the monitoring stations that provide the most representative ambient air quality background data.[19]

Deleted: Table 5.1-33

---

[18] AERSURFACE is a surface characteristics preprocessor that is part of the AERMOD modeling system.

[19] Selection of the background monitoring stations is also discussed in Section 5.1.3.4.

TABLE 5.1-33
Representative Background Ambient Air Quality Monitoring Stations

Pollutant(s)	Monitoring Station	Distance to Project Site
Ozone, PM_{10}, $PM_{2.5}$	Jean, NV (Clark County)	34 miles
CO	Barstow, CA (San Bernardino County)	97 miles
NO_2, SO_2	Trona, CA (San Bernardino County)	82 miles
Lead	San Bernardino, CA (San Bernardino County)	150 miles

Although the PM_{10} monitoring site at Pahrump, Nevada, is closer to the project site than the Jean station, as discussed above, the Pahrump data are strongly affected by local windblown dust, and are therefore not representative of regional background concentrations.

As discussed in Section 5.1.2, NO_2 data were collected at Jean until 2007. More current NO_2 data from Trona are used to conservatively overestimate background NO_2 concentrations at the project site. Background data representative of conditions at the project site are summarized in Table 5.1-34.

Deleted: Table 5.1-34

TABLE 5.1-34
Representative Background Concentrations in the Project Area

Pollutant	Averaging Time	2008	2009	2010
Trona (San Bernardino County)				
NO_2	1 hour (1st high)	117	92.1	97.8
	1 hour (98th percentile)[b]	80.8	73.3	79.0
	Annual	7.5	7.5	—[a]
SO_2	1 hour	93.6	28.6	31.2
	3 hours	15.6	20.8	23.4
	24 hours	13.1	7.9	10.5
	Annual	2.7	2.7	—
Barstow (San Bernardino County)				
CO	1 hour	1,750	1,125	1,125
	8 hours (CA. 1st high)	1,333	1,000	—
Jean, NV				
PM_{10}	24 hours	96	81.3	49
	Annual (CA)	14	12.4	8.5
$PM_{2.5}$	24 hours (3-yr avg, 98th Percentile)[b,c]	10.3	11.2	11.4
	Nat'l 3-Year Avg AAM [d]	4.9	4.0	3.5

[a] Insufficient data.

[b] Calculated from http://www.epa.gov/mxplorer/index.htm, "Query Concentrations" function

[c] See Table 5 of the modeling protocol in Appendix 5.1H.

[d] Annual arithmetic mean

5.1.4.5.6 Construction Impacts

Section 5.1.4.3.8 describes the development of project emissions estimates over the planned 29-month construction period. An Excel workbook was created to estimate pollutant emissions from construction activities. Emissions from worker commuter trips to and from the project site and heavy trucks delivering materials to and from the site during specific construction activities were also included (see Appendix 5.1F).

Based on information provided by the engineering design contractor and the emission estimates in Appendix 5.1F-1, the peak month in terms of air pollutant emissions is expected to be the eighth month of construction (Month 8). Worst-case modeling was conducted for short-term averaging times using all combustion emissions from all construction equipment from Month 8 and dust emissions from activities in Months 8 and 9 (see Table 5.1-31 and Table 5.1-32). Construction activities were assumed to occur during a 20-hour work day during these periods, reflecting double-shift activity. The annual emissions were modeled for Months 6–17 for combustion emissions and Months 4–15 for fugitive dust emissions after a determination that these consecutive 12-month periods will have higher levels of construction activity and exhaust and dust emissions than any others over the full 29 months of construction. The construction impact modeling was performed with no downwash. The emission sources for the construction site were grouped into three categories: exhaust emissions, construction dust emissions, and windblown dust emissions. The vehicle exhaust and construction dust emissions were modeled as 26 volume sources with a vertical dimension of 6 meters. Among the 26 volume sources, 24 were located completely within the project boundary and were used to represent the construction dust and combustion exhaust sources from the project site. Two volume sources were located within both the laydown area and the project fence line and were used to represent construction dust and combustion exhaust sources in those areas. Based on the width of the construction area, the horizontal dimension for each volume source was set to 563.8 meters, with sigma-y = 131.1 meters. The fugitive dust emissions from disturbed areas were represented for modeling purposes as area sources. To assess impacts from fugitive dust, the project site and the laydown area were modeled as one single area source covering a combined disturbed area of 2,960 acres.[20] The effective plume height for these two area sources was set at 0.5 meters in the modeling analysis.

Deleted: Table 5.1-31

Deleted: Table 5.1-32

As discussed in the modeling protocol, the Ozone-Limiting Method (OLM) option of AERMOD was used to account for the role of ambient ozone levels on the atmospheric conversion rate of NOx emissions (initially mostly in the form of nitric oxide) to NO_2 (the pollutant addressed by ambient standards). Hourly ozone measurements at the Jean, Nevada, monitoring station during the same 5 years of the meteorological input data set were used to support the OLM calculations. Modeling results are shown in Table 5.1-35R.[21]

Deleted: Table 5.1-35

Table 5.1-35R shows that the worst-case background concentration of 24-hour average PM_{10} is already above the state standards, while background concentrations of PM_{10} and $PM_{2.5}$ are below the state and federal standards. The project's modeled annual PM_{10} and $PM_{2.5}$ impacts are small relative to the background; the annual $PM_{2.5}$ impact is barely above the federal threshold for significance of 0.3 µg/m^3.

Deleted: Table 5.1-35

The project's construction emissions will result in potentially significant impacts for PM_{10} and $PM_{2.5}$. Emissions and modeled impacts from construction activities are not unusual

---

[20] As discussed in Section 5.1.4.3.8, not all of the project site will be disturbed. This assessment of fugitive dust impacts is conservative in that it overestimates the disturbed area.

[21] Modeled construction impacts presented in Table 5.1-35R reflect the revised results submitted in response to Staff's Data Request 8 (Set 1A), November 2011. As indicated in Footnote 13, the Boiler Optimization is not expected to result in any changes to the construction schedule or loading upon which the AFC and DR8 analyses are based.

compared with those from other construction projects. Appendix 5.1F describes the mitigation measures that will be used during construction to minimize these impacts.

The data summarized in Table 5.1-35R show that construction emissions will not cause new exceedances of any other state or federal air quality standards, including the state and federal 1-hour NO_2 standards.

Deleted: Table 5.1-35

TABLE 5.1-35R
Modeled Maximum Impacts During Project Construction

Pollutant	Averaging Period	Maximum Predicted Impact (µg/m^3)	Maximum Background Concentration (µg/m^3)	Total Concentration[a] (µg/m^3)	NAAQS (µg/m^3)	CAAQS (µg/m^3)
NO_2	1-hr (highest)	133.5	117	251	—	339
	1-hr (98th percentile)	88.0	80.8	169	188	—
	Annual	3.7	7.5	11	100	57
SO_2	1-hr	0.2	93.6	94	196	655
	3-hr	0.2	23.4	24	1300	—
	24-hr	0.05	13.1	13	—	105
	Annual	0.01	2.7	2.7	80	—
CO	1-hr	66.8	1,750	1,817	40,000	23,000
	8-hr	28.3	1,333	1,361	10,000	20.000
PM_{10}	24-hr	24.2	96	120	150	50
	Annual	1.4	14	15	—	20
$PM_{2.5}$	24-hr[b]	5.1	11.4	17	35	—
	Annual[c]	0.3	4.9	5.2	15.0	12

Deleted: 100.1
Deleted: 217
Deleted: 85.8
Deleted: 167
Deleted: 3.4
Deleted: 62.9
Deleted: 1,813
Deleted: 26.7
Deleted: 1,360

[a] Total concentrations shown in this table are the sum of the maximum predicted impact and the maximum measured background concentration. Because the maximum impact is unlikely to occur at the same time as the maximum background concentration, the actual maximum combined impact will be lower.

[b] Background concentration shown is the three-year average of the 98th percentile values, in accordance with the form of the federal standard. See Table 5.1-34, footnote c.

Deleted: Table 5.1-34

[c] Background concentration shown is the three-year average of the annual arithmetic mean, in accordance with the form of the standard.

5.1.4.5.7 Operational Impacts

Normal Plant Operations

The results of the AERMOD assessment for normal plant operations are summarized in Table 5.1-36R. Listed below are the operating assumptions used in developing the emission rates for each emissions unit and averaging period. Emission rates and stack parameters used in modeling impacts during normal plan operations are shown in Table 5.1D-2, Appendix 5.1D.

Deleted: Table 5.1-36

1-hour averages

- All emergency engines operational for testing; and
- All boilers operating at full load.

Deleted: OR

3-hour and 8-hour averages

- All emergency engines operational for testing; and
- All boilers operating at full load.

Deleted: OR

24-hour averages

- All boilers operating with maximum daily emissions and WSACs in operation, and all emergency engines operational for testing.

Annual Averages

- All equipment included.
- For all pollutants, maximum annual emissions used to calculate average hourly emission rate.

The modeling results in Table 5.1-36R show that only 1-hour NO_2 and SO_2 impacts exceed the interim PSD SILs—all other modeled impacts during all operating scenarios are below the significant impact levels.

Startup Impact Analysis

As discussed in Section 5.1.4.2, the boilers will need to undergo occasional cold startups, during which they may operate for extended periods at low loads. Although hourly mass emissions from the boilers during startup will not be higher than hourly mass emissions during normal operations, the low heat inputs and exhaust flow rates will result in different dispersion characteristics that may affect modeled ground level concentrations. Therefore, ambient air quality impact analysis included assessments of potential air quality impacts of boiler startups. To simplify the analyses and ensure they are conservative, the following scenarios were evaluated:

- Auxiliary boiler startup: Auxiliary boiler at each power block is in startup simultaneously. Startups may occur while nighttime boilers are in operation. Although startup times for the auxiliary boilers are not expected to exceed 5 hours at a time, 8-hour CO emission rates reflect 8 hours of startup to be conservative.

- Nighttime boiler startup: Nighttime boiler at each power block is in startup simultaneously. Startups may occur while auxiliary boilers are in operation. Although startup times for the nighttime preservation boilers are not expected to exceed 1 hour, 8-hour CO emission rates reflect 8 hours of startup to be conservative.

Emission rates and stack parameters for the boiler startup analyses are shown in Table 5.1D-3R, Appendix 5.1D. Results of the startup impact analysis are shown in Table 5.1-36R along with results for other operating conditions. The highest startup impacts occur during startup of the auxiliary boilers.

Deleted: ; OR¶
Startup and nighttime preservation boilers operating at full load

Deleted: The highest 1-hour NO_2 impacts occur during engine testing. The highest impacts for other pollutants and averaging periods occur during boiler operation.¶

Deleted: Table 5.1-36

Deleted: with, in some cases, emission rates that are slightly higher than emissions during normal operations

Deleted: <#>Auxiliary boiler startup: One unit at each power block is in startup simultaneously. No other boilers or engines are operating. Although startup times for the auxiliary boilers will not exceed 6 hours, 8-hour CO emission rates reflect 8 hours of startup to be conservative.¶
Startup

Deleted: Startup

Deleted: startup

Deleted: will

Deleted: will

Deleted: 4

Deleted: s

Deleted: Table 5.1-36

Deleted: *<#>Ambient Impacts During Hot Standby Operation¶*
On some days when cloudy weather is anticipated, the auxiliary boilers may be operated on hot standby starting earlier in the day so that they will be available to augment the solar operations when solar energy diminishes or during transient cloudy conditions. When operating in hot standby mode, the boilers would operate at about 5 percent of their rated heat input rate. As discussed earlier, emissions during hot standby will be very low because of the low heat input. However, because of the low potential stack velocities, this operating mode has been included in the ambient air quality assessment. The modeling analysis for this operating mode assumes that all six boilers are on hot standby simultaneously for up to 8 hours. This assumption conservatively overestimates impacts during this operating mode. Emission rates and stack parameters used in evaluating impacts during hot standby operation are shown in Table 5.1D-4, Appendix 5.1D. Modeled impacts are shown in Table 5.1-36.¶

TABLE 5.1-36R
Summary of Modeling Results for Facility Operations

Pollutant	Averaging Period	Modeled Concentration (µg/m3) Normal Operation	Startup Operation	Inversion Breakup Fumigation	PSD Significant Impact Level (µg/m^3)
NO_2	1-hr (max)	184	58	8.6	7.5[d]
	1-hr (98th pct)	141	38	n/a[b]	—
	Annual	0.2	n/a[a]	n/a[c]	1.0
SO_2	1-hr	10.8	10	1.6	7.8[d]
	3-hr	5.8	5.4	1.5	25
	24-hr	0.30.01	n/a[a]	0.6	5
	Annual		n/a[a]	n/a[c]	1.0
CO	1-hr	256	115	21.515.0	2000
	8-hr	27.2	26		500
PM_{10}	24-hr	0.85	n/a[a]	0.76	5
	Annual	0.02	n/a[a]	n/a[c]	1
$PM_{2.5}$	24-hr	0.85	n/a[a]	0.76	1.2
	Annual	0.02	n/a[a]	n/a[c]	0.3

All NO_2 results except fumigation reflect ozone limiting.

[a] Startup operations are short-term operating modes and do not affect averaging periods longer than 8 hours.

[b] Inversion breakup fumigation is modeled using screening models so no 98th percentile value can be produced.

[c] Inversion breakup fumigation is a short-term phenomenon and does not affect annual impacts.

[d] These are interim SILs and have not been formally adopted by EPA.

Inversion Breakup Fumigation Modeling

Inversion breakup fumigation occurs when a stable layer of air lies a short distance above the release point of a plume and unstable air lies below. Under these conditions, an exhaust plume may be drawn to the ground, causing high ground-level pollutant concentrations. Although fumigation conditions rarely last as long as 1 hour, relatively high ground-level concentrations may be reached during that time. For this analysis, fumigation was assumed to occur for up to 90 minutes, per EPA guidance.

The SCREEN3 model was used to evaluate maximum ground-level concentrations for short-term averaging periods (24 hours or less). Guidance from EPA[22] was followed in evaluating fumigation impacts. The maximum fumigation impact from this analysis, which is shown in more detail in Table 5.1D-5R, Appendix 5.1D, showed that impacts under fumigation conditions are expected to be lower than the maximum concentrations calculated by AERMOD under normal operations (including downwash conditions). Inversion breakup impacts are also shown in Table 5.1-36R.

5.1.4.5.8 Demonstration of Compliance

The maximum facility impacts calculated from the modeling analyses described above are summarized in Table 5.1-36R above. To determine the project's air quality impacts, the

Deleted: **Hot Standby Operation**
Deleted: 220
Deleted: [a]
Deleted: 35.1…8 ... [11]
Deleted: 59.7
51.8 ... [12]
Deleted: 17.3
Deleted: [e]
Deleted: 166
Deleted: [a]
Deleted: [c]…n/a[cd] ... [13]
Deleted: 0.1
Deleted: [b]
Deleted: 19.0…0.8 ... [14]
Deleted: 1.1…0 ... [15]
Deleted: 1.2 ... [17]
Deleted: 3.4….6 ... [18]
Deleted: [e]
Deleted: [b]…n/a[ab] ... [16]
Deleted: [d]
Deleted: 261.7…56 ... [19]
Deleted: 94.9…15 ... [20]
Deleted: 101.0 ... [21]
Deleted: 52.9…1.5 ... [22]
Deleted: 1.1….85 ... [23]
Deleted: [b]… ... [24]
Deleted: n/a[b] ... [25]
Deleted: 0.7
Deleted: [d]
Deleted: 1.1….85 ... [26]
Deleted: [b]… ... [27]
Deleted: n/a[b] ... [28]
Deleted: 0.7
Deleted: [d]
Deleted: [a] Highest 1-hour average NO_2 ... [29]
Deleted: [b]
Deleted: and hot standby
Deleted: [c]
Deleted: [d]
Deleted: [e]
Deleted: Table 5.1-36
Deleted: ¶
Deleted: Table 5.1-36…R above. The hi ... [30]

---

[22] EPA-454/R-92-019, "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised."

modeled concentrations are added to the highest reported background ambient air concentrations and then compared to the applicable ambient air quality standards. The highest reported background ambient concentrations were discussed in Section 5.1.3.4 and the monitored concentrations during the past three years are shown in Table 5.1-37R. More detailed discussions of why the data collected at these stations are representative of ambient concentrations in the vicinity of the project are provided in Sections 5.1.3.4 and 5.1.4.5.

TABLE 5.1-37R
Summary of Results (Modeled Maximum Impacts plus Background)

Pollutant	Averaging Time	Project Impact (µg/m³)	Background Concentration (µg/m³)	Total Concentration (Project Impact plus Background) (µg/m³)	NAAQS (µg/m³)	CAAQS (µg/m³)
NO_2	1-hr (max)	184	117	230[a]	—	339
	1-hr (98th ptl)	141	80.8	151[a]	188	—
	Annual	0.2	7.5	7.7	100	57
SO_2	1-hr	11	93.6	104	196	655
	3-hr	5.8	23.4	29	1300	—
	24-hr	0.3	13.1	13.4	—	105
	Annual	0.01	2.7	2.7	80	—
CO	1-hr	256	1,750	2,006	40,000	23,000
	8-hr	27	1,333	1,360	10,000	20.000
PM_{10}	24-hr	0.8	96	96.8	150	50
	Annual	0.02	14	14	—	20
$PM_{2.5}$	24-hr	0.8	11.4	12.2	35	—
	Annual	0.02	4.9	4.9	15.0	12

[a] 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.

5.1.4.5.9 PSD Increment Consumption

The Prevention of Significant Deterioration (PSD) program was established to allow emission increases (increments of consumption) that do not result in significant deterioration of ambient air quality in areas where criteria pollutants have not exceeded the NAAQS. As discussed in Section 5.1.4.3, the project is not subject to PSD review.

5.1.4.5.10 Preconstruction Monitoring

Because HHSEGS is not subject to PSD review, EPA will not require preconstruction ambient air quality monitoring data for the purposes of establishing background pollutant concentrations in the impact area.

5.1.4.5.11 Commissioning Impacts

Commissioning emissions are quantified in Table 5.1B-18R, Appendix 5.1B. Maximum emissions from each boiler are expected to occur during the cold start/tuning phase of commissioning, and during that period boiler operation and emissions are expected to be similar to those that occur during cold startups. Ambient impacts during boiler startups were evaluated above (see Table 5.1-36R) and shown not to be expected to cause or contribute to any violations of the ambient air quality standards.

Deleted: Table 5.1-37

Deleted: 220.0

Deleted: 226

Deleted: *

Deleted: 165.8

Deleted: 174

Deleted: *

Deleted: 0.1

Deleted: 7.6

Deleted: 113

Deleted: 19.0

Deleted: 32

Deleted: 8.7

Deleted: 14

Deleted: 0.5

Deleted: 261.7

Deleted: 2,012

Deleted: 64.3

Deleted: 1,397

Deleted: 1.1

Deleted: 97.1

Deleted: 0.03

Deleted: 1.1

Deleted: 12.5

Deleted: 0.03

Deleted: *

Deleted: Table 5.1-34

Deleted: Table 5.1-36

5.1.4.5.12 Impacts from Mirror Washing Activities

Although Applicant believes that mirror washing activities are not part of the stationary source for any applicable LORS, an assessment of the combined impacts of project operations and mirror washing activities has been prepared. Emission rates and stack parameters for the stationary sources are the same as for the project-only analysis described above, and are presented in Table 5.1D-2R, Appendix 5.1D. Emission rates and stack parameters for the MWMs are shown in Table 5.1D-6. 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 40 point sources distributed over the project area.

The results of the modeling analysis that includes the MWMs are summarized in Table 5.1-38.

TABLE 5.1-38

Total Project Impacts Including Mirror Washing Activities

Pollutant	**Averaging Time**	**Project Impact (µg/m^3)**	**Background Concentration (µg/m^3)**	**Total Concentration (Project Impact plus Background) (µg/m^3)**	**NAAQS (µg/m^3)**	**CAAQS (µg/m^3)**
NO_2	1-hr (max)	184	inc[a]	230	—	339
	1-hr (98th ptl)	141	inc[a]	151	188	—
	Annual	0.2	7.5	7.7	100	57
SO_2	1-hr	10.8	93.6	104	196	655
	3-hr	5.8	23.4	29	1300	—
	24-hr	0.3	13.1	13.4	—	105
	Annual	<0.1	2.7	3	80	—
CO	1-hr	256	1,750	2,006	40,000	23,000
	8-hr	27	1,333	1,360	10,000	20.000
PM_{10}	24-hr	3.5	96	100	150	50
	Annual	0.7	14	15	—	20
$PM_{2.5}$	24-hr	1.1	11.4	13	35	—
	Annual	0.1	4.9	5	15.0	12

[a] 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.

Deleted: *

Deleted: *

Deleted: *

5.1.4.6 Screening Health Risk Assessment

The screening health risk assessment (SHRA) was conducted to determine expected impacts on public health of the noncriteria pollutant emissions from the operation of the boilers and emergency Diesel engines.[23] The SHRA was conducted in accordance with the OEHHA's "Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments" (October 2003).

---

[23] The WSACs were not included in the screening HRA because their TAC emissions are negligible (see Table 5.1B-17R, Appendix 5.1B).

The SHRA estimated the offsite potential Maximum Incremental Cancer Risk (MICR) at the point of maximum impact, at the location (e.g., residence) of the maximally exposed individual (MEI) and to the maximally exposed worker (MEW), and the potential long-term (chronic) and short-term (acute) non-carcinogenic health impacts from non-carcinogenic emissions. The CARB/OEHHA-approved Hotspots Analysis and Reporting Program (HARP) (Version 1.4d) was used to evaluate multipathway exposure to non-criteria pollutant emissions. The individual pollutant carcinogenic risks are assumed to be additive. Because of the conservatism (overprediction) built into the established risk analysis methodology, the actual risks will be lower than those estimated.

The SHRA utilized the following information:

- Inhalation cancer potency factors for the carcinogenic emissions
- Noncancer Reference Exposure levels (RELs) for determining chronic and acute non-carcinogenic health impacts
- One-hour and annual average emission rates for each non-criteria pollutant
- The modeled maximum offsite concentration of each non-criteria pollutant emitted

Many of the carcinogenic compounds also have non-carcinogenic health effects and are therefore included in the determination of both potential carcinogenic and noncarcinogenic effects. RELs are used as indicators of potential non-carcinogenic adverse health effects. RELs are generally based on the most sensitive adverse health effect reported and are designed to protect the most sensitive individuals. However, exceeding the REL does not automatically indicate a health impact. The OEHHA RELs were used to determine potential adverse health effects from noncarcinogenic compounds. A potential chronic health hazard index for each relevant non-carcinogenic pollutant is then determined by the ratio of the pollutant maximum annual average concentration to its respective REL. Similarly, a potential acute health hazard index for each relevant non-carcinogenic pollutant is determined by the ratio of the pollutant maximum one-hour average concentration to its respective REL. The individual indices are summed to determine the overall hazard index for the project. Because noncarcinogenic compounds target different internal systems or organs (e.g., respiratory system, nervous system, eyes), this sum is considered conservative.

The SHRA results are compared with the established risk management procedures for the determination of acceptability. The established risk management criteria include those listed below.

- If the MICR is less than one in one million, the facility risk is considered not significant.
- If the MICR is greater than one in one million but less than ten in one million and Toxics-Best Available Control Technology (T-BACT) has been applied to reduce risks, the facility risk is considered acceptable.
- If the MICR is greater than ten in one million but less than 100 in one million and there are mitigating circumstances that, in the judgment of a regulatory agency, outweigh the risk, the risk is considered acceptable.
- For non-carcinogenic effects, total hazard indices of one or less are considered not significant.

- For a hazard index greater than one, OEHHA, the CEC and the GBUAPCD may conduct a more refined review of the analysis and determine whether the impact is acceptable.

The SHRA includes the noncriteria pollutants listed above in Table 5.1-20R. The receptor grid described earlier for criteria pollutant modeling was used for the SHRA. The potential health risks are presented in Table 5.1-39R, and the detailed calculations are provided in Appendix 5.1E. The locations of the maximum modeled risks are shown in Appendix 5.1E, Figure 5.1E-1.

Deleted: Table 5.1-38

Deleted: **38**

TABLE 5.1-39R
Potential Health Risks from the Operation of the Project, Including Mirror Washing Machines

	Project	Significance Thresholds	Significant?
Maximum Incremental Cancer Risk (MICR) at Point of Maximum Impact	2.8 in one million	10 in one million	No
MICR at Residential Receptor	0.5 in one million	1 in one million	No
Acute Inhalation Health Hazard Index: 1-hour	0.003	1.0	No
Acute Inhalation Health Hazard Index: 8-hour	0.002	1.0	No
Chronic Inhalation Health Hazard Index	0.001	1.0	No

Deleted: 0.39

Deleted: 0.15

Deleted: 0.004

Deleted: 4

Deleted: 02

The acute and chronic health hazard indices are well below 1.0, and hence, are not significant. The MICR is 0.39 in one million, below the GBUAPCD's 1 in one million threshold for additional analysis and the ten in one million significance threshold for the project. The project will not pose a significant health risk at any location, under any weather conditions, under any operating conditions. Including MWMs in the cancer risk assessment has minimal effect on the modeled residential cancer risk, increasing the maximum modeled risk at the point of maximum impact from 2.75 to 2.82 in one million. Residential cancer risk remains well below the 10 in one million level considered to be significant.

Potential health risks during construction are evaluated in Appendix 5.1F. This evaluation concludes that health risks during construction will not be significant.

5.1.5 Cumulative Effects

A CEQA cumulative impacts analysis examines potential cumulative air quality impacts that may result from the project and other reasonably foreseeable projects. Such an analysis is generally required only when project impacts are significant.

5.1.5.1 Cumulative Construction Impacts

Project construction will occur over a 29-month period. Impacts during construction will be localized, as discussed in Appendix 5.1F. Construction of the transmission and gas lines will occur concurrently with onsite construction, but most of the linears construction will occur at distances of more than 10 miles from the project site. Because impacts from linears construction are also expected be localized, it is unlikely that any cumulative construction impacts will occur with the exception of the construction of the linears that are closest to the project. Therefore any cumulative construction impacts will be temporary and localized and as such are not expected to be significant.

5.1.5.2 Cumulative Operational Impacts

To ensure that potential cumulative impacts of the project and other nearby projects were adequately considered, a cumulative impacts analysis was conducted in accordance with the protocol included as Appendix 5.1G. The Applicant requested information for a cumulative impact analysis from the GBUAPCD, Clark County Department of Air Quality and Environmental Management, and the Nevada Division of Environmental Protection, Department of Air Quality Management, Bureau of Air Pollution Control ("Nevada DEP"). The request letters and any agency responses received before the AFC was filed were included in Attachment 5.1G-1 to Appendix 5.1G of the AFC.

Deleted: are

Deleted: will be

To summarize, the GBUAPCD responded that "[t]here are no facilities in the District, other than the St. Therese project, within 6 miles of the perimeter of the Hidden Hills Ranch project." Nevada DEP responded with a list of active permits in the general project area.

Attachment 5.1G-1 includes the list provided by Nevada DEP and a description of the analysis used to determine that none of the projects on the list provided by Nevada DEP is within 6 miles of the project site.

The Clark County response to the request for information regarding potential sources to be included in a cumulative impact analysis was received on August 25, 2011, after the AFC had been filed, and was docketed on August 29. Clark County responded:

> We have five permitted sources in, or near, that hydrographic area, but, none of these are within the 6 miles perimeter of the site you have identified. In fact, it appears the closest permitted source is over 20 miles away. Our search of our records did not indicate any proposed authority to construct projects within the area for which we have received an application.

Copies of the agency correspondence, demonstrating that there are no projects meeting the criteria of the request, are provided in Appendix 5.1G-1.

5.1.5.3 Greenhouse Gas Cumulative Effects Analysis

In 2006, the California Legislature adopted AB 32, the California Global Warming Solutions Act of 2006. This legislation started California on the path to reduce emissions of GHGs in California to 1990 levels. The principal regulated GHG is carbon dioxide, which is emitted primarily from the combustion of fossil fuels.

The legislation requires CARB to determine the 1990 levels, and to adopt regulatory mechanisms to bring California's emissions back down to those levels by 2020. The legislation does not require that individual facilities or sectors return to 1990 levels. It is expected that some sectors will achieve greater reductions than others.

It is unlikely that California's entire program will have a measurable impact on global climate change. Rather, it is asserted that California's effort, in conjunction with similar efforts worldwide, could reduce or even eliminate the negative impacts associated with global climate change.

It follows that no individual project, or even the cumulative effects of all of the reasonably foreseeable projects in California, will have a measurable impact on global climate change. However, new emissions of carbon dioxide will make it more difficult for the state to meet its goal of reducing GHG emissions to 1990 levels.

State agencies are developing the plans and regulations necessary to achieve the GHG emission reductions required by AB 32. The starting point of these plans is a projection of what emissions would be in 2020 if business went on as usual. A significant amount of new emissions in the "business as usual" scenario comes from increased demand for electricity in California. In the absence of established thresholds of significance or methodologies for assessing impacts, this analysis of GHG emission impacts consists of quantifying project-related GHG emissions, determining their significance in comparison to the goals of AB 32, and discussing the potential impacts of climate change within the state as well as strategies for minimizing those impacts.

Regulations already in place require that much of that increased demand be met by projects like HHSEGS, which generate energy that does not derive from the combustion of fossil fuels. The California legislature recently adopted Senate Bill 1X 2 (SB 2), which requires 33 percent of retail electricity sales to come from renewable resources by 2020. SB 2 also establishes interim targets for renewable generation to ensure that timely progress is made toward the 33 percent RPS goal, requiring that 75 percent of generation must come from within California by 2016. The HHSEGS project will help to further progress toward the SB 2 goals by providing a reliable, in-state source of renewable electricity that will come online before the 2016 interim deadline.

Most renewable energy facilities such as wind and solar are "intermittent resources," meaning these resources are not available to generate in all hours and thus have limited operating capacity. For example, intermittent resources can be limited by meteorological conditions on an hourly, daily, and seasonal basis. In addition, the availability of intermittent resources is often unrelated to the load profile they serve. For example, some solar resources reach peak production around 12:00 noon, while the electrical demand sometimes peaks between 5:00 p.m. and 7:00 p.m. HHSEGS has the advantage over many other solar facilities of being able to provide electricity during the peak evening demand period through the use of the auxiliary boilers to augment the solar operation when solar energy diminishes or during transient cloudy conditions that impact the available solar energy.

HHESGS supports the State's strategy to reduce fuel use and GHG emissions. Although the use of natural-gas-fired auxiliary boilers will result in GHG emissions, the overall GHG emission rate for the project will be below the EPS standard of 0.500 metric tons CO_2 per MWh and below the rates for comparably sized fossil-fueled projects. Table 5.1-40 compares the GHG emissions performance of HHSEGS with that of other types of power plants.

Deleted: Table 5.1-39

TABLE 5.1-40R
Comparison of GHG Emissions Performance

Type of Power Plant	GHG Emissions Performance, MT CO_2/MW[a]
HHSEGS	0.028
Natural Gas Combined Cycle	0.370 to 0.430
California GHG Emissions Performance Standard (EPS)	0.500
Natural Gas-Fired Boiler	0.550 to 0.650
Natural Gas-Fired Peaking Turbine	0.550 to 0.900
Coal-Fired Boiler	~1.00

[a] All GHG emissions performance data except HHSEGS from Ivanpah FSA, Appendix Air-1, October 2009.

Deleted: **39**

Deleted: *

Deleted: 0.060

Deleted: *

Further, even though it is possible to quantify how many gross GHG emissions are attributable to the project, it is difficult to determine whether this will result in a net increase of these emissions—and, if so, by how much—due to the displacement by the project of emissions from fossil generating resources. The loading order adopted in 2003 by the CEC and PUC prioritizes the use of generation from renewables, such as HHSEGS, over generation from fossil fuel resources. In addition, the CEC has predicted that as California moves towards an increased reliance on renewable energy, non-renewable energy sources will be curtailed or displaced."[24] Therefore, it would be speculative to conclude that greenhouse gas emissions from any given project will cause a cumulatively significant adverse impact.

Demand for electricity in California will not be affected by HHSEGS. Every megawatt-hour generated by the project, however, will displace a megawatt-hour that would otherwise have been generated by a more traditional (i.e., fossil-fuel-fired) source of electricity. HHSEGS will increase renewable generation and contribute to the state's efforts to move toward a high-renewable, low-GHG electricity system. HHSEGS is therefore expected to result in a net reduction in GHG emissions.

As directed by SB 97, the Resources Agency adopted Amendments to the CEQA Guidelines for greenhouse gas emissions (GHG CEQA Guidance) on December 30, 2009. On March 18, 2010, those amendments became effective.

The GHG CEQA Guidance included the following elements:

- Quantification of GHG emissions;
- Determination of whether the project may increase or decrease GHG emissions as compared to existing environmental setting;
- Determination of whether the project emissions exceed a threshold of significance determined by the lead agency;
- The extent to which the project complies with state, regional, or local plans for reduction or mitigation of GHGs; and

---

[24] Commission Decision for the Ivanpah SEGS, CEC-800-2010-004 CMF, September 2010.

- Mitigation measures.

GHG emissions were quantified in Table 5.1-28. The discussion above supports a determination that the project can be expected to decrease GHG emissions as compared with the current situation. HHSEGS will provide more than 1,500 GWh of renewable generation that could replace aging, less-efficient, coal-fired and/or once-through cooled generating resources. The preceding discussion also demonstrates that GHG emissions from the project will be below the EPS, which is generally accepted as a threshold of significance for GHG emissions from electric generation facilities, and will further the state's progress toward its RPS and SB 2 goals. Because the GHG emissions are not expected to be significant, no additional mitigation is necessary.

Deleted: Table 5.1-28

5.1.6 Consistency with Laws, Ordinances, Regulations, and Standards

This section considers consistency separately for federal, state, and local requirements.

5.1.6.1 Consistency with Federal Requirements

Prevention of Significant Deterioration Program

The PSD requirements apply, on a pollutant-specific basis, to any project that is a new major stationary source or a major modification to an existing major stationary source. A major source is a listed facility (one of 28 PSD source categories listed in the federal Clean Air Act) that emits at least 100 tpy, or any other facility that emits at least 250 tpy. Effective July 1, 2011, PSD will also apply to a new stationary source that emits more than 100,000 tpy of GHGs and more than 100 tpy of any individual GHG. Because the emissions of all PSD pollutants will be below 100 tpy, and the GHG emissions for the proposed project will be below the PSD major source threshold of 100,000 tpy, the proposed project is not subject to PSD review.

Nonattainment New Source Review

Nonattainment New Source Review jurisdiction has been delegated to the GBUAPCD for all pollutants and is discussed further under local requirement conformance below.

New Source Performance Standards

The boilers used at the proposed project will be subject to the following NSPS:

- Subpart Db: New Source Performance Standards for Industrial-Commercial-Institutional Steam Generating Units (startup boilers)
- Subpart Dc: New Source Performance Standards for Small Industrial-Commercial-Institutional Steam Generating Units (nighttime preservation boilers)

Deleted: <#>Subpart Da: New Source Performance Standards for Electric Utility Steam Generating Units (auxiliary boilers)¶

The NSPS emissions limits are compared with the proposed permit limits in Table 5.1-41R below. Emissions from the boilers will be well below the NSPS limits.

Deleted: Table 5.1-40

TABLE 5.1-41R
Comparison of Boiler Emission Rates with Applicable NSPS Standards

Deleted: **40**

	NOx	SO_2	PM
Subpart Db Limit (Startup Boilers)	0.20 lb/MMBtu	0.20 lb/MMBtu	none
Subpart Dc Limit (Nighttime Preservation Boilers)	None	none	none
Proposed Permit Level	0.011 lb/MMBtu	0.0021 lb/MMBtu	0.005 lb/MMBtu

Deleted: Subpart Da Limit (Auxiliary Boilers)

Deleted: 0.20 lb/MMBtu

Deleted: 1.4 lb/MWh

Deleted: 0.015 lb/MMBtu

The boilers are exempt from the continuous opacity and SOx monitoring requirements of the NSPS because they will burn solely natural gas fuel. The auxiliary boilers will use predictive emissions monitoring in lieu of continuous monitoring for NOx (40 CFR 48b(g)(2)), and will use the LME alternative to acid rain CEMS to comply with the monitoring requirements of Part 75.

Deleted: The auxiliary boilers must continuously monitor NOx emissions (40 CFR 60.49a), but will use the NOx CEMS required under Part 75 to meet the NOx monitoring requirement.

Deleted: startup

- Subpart IIII: New Source Performance Standards for Stationary Compression Ignition Engines (emergency engines, including fire pump engines)

The power block emergency generators, rated at 2.5 MW, are subject to Nonroad Tier 2 emission standards;[25] the project will comply by purchasing Tier 2 engines. The common area emergency generator, rated at 250 kW, is subject to Nonroad Tier 3 standards; a Tier 3 –certified engine has been selected for this application. The fire pump engines proposed for the project are certified to Tier 3 nonroad standards, as required by the NSPS.

National Emission Standards for Hazardous Air Pollutants

This program establishes national emission standards to limit emissions of hazardous air pollutants (HAPs, or air pollutants identified by EPA as causing or contributing to the adverse health effects of air pollution but for which NAAQS have not been established) from facilities in specific source categories. These standards are implemented at the local level with federal oversight. EPA has promulgated NESHAP for boilers at area sources (40 CFR 63 Subpart JJJJJJ) and compression ignition engines (RICE; 40 CFR 63 Subpart ZZZZ). However, the area source boiler NESHAP does not apply to natural-gas-fired units, while the RICE NESHAP requires only new emergency RICE to comply with the applicable NSPS. Therefore the NESHAP will impose no additional requirements on the facility.

Acid Rain Program

This program requires the monitoring and reporting of emissions of acidic compounds and their precursors from combustion power generation equipment. These requirements are implemented at the local level with federal oversight. The auxiliary boilers will be required to comply with the acid rain program requirements. The applicant will file an acid rain permit application in accordance with the deadlines in GBUAPCD Rule 217 and 40 CFR Part 75. Because of their relatively low emissions, the auxiliary boilers are expected to qualify for alternative emissions monitoring in lieu of CEMS. The LME methodology allows the

Deleted: GBUAPCD has received delegation authority to implement Title IV.

---

[25] Because these are emergency engines, they are not required to meet standards that require “add-on” controls, such as diesel particulate filters or SCR.

owner/operator to calculate hourly SO_2, NOx, and CO_2 emissions using fuel-specific emission factors. The Applicant will submit a certification application to EPA demonstrating that the auxiliary boilers qualify for LME status so that the auxiliary boilers will not be required to use acid rain CEMS.

Title V Operating Permits Program

This program requires the issuance of operating permits that identify all applicable federal performance, operating, monitoring, recordkeeping, and reporting requirements. Title V applies to major facilities, Phase II acid rain facilities, subject solid waste incinerator facilities, and any facility listed by EPA as requiring a Title V permit. GBUAPCD has received delegation authority for this program. The project is subject to Title V requirements because it is a Phase II acid rain facility and will comply with the requirements of Title V by filing the required permit application as required by GBUAPCD Rule 217.

Deleted: in accordance with the deadlines in

5.1.6.2 Consistency with State Requirements

As discussed in Section 5.1.2.2, state law established local air pollution control districts and air quality management districts with the principal responsibility for regulating emissions from stationary sources. The proposed project is under the local jurisdiction of the GBUAPCD; therefore, compliance with GBUAPCD regulations will assure compliance with state air quality requirements.

The CO_2 emission rate of 0.028 MT/MWh would meet the EPS of 0.500 MT/MWh. However, as a solar power plant, the project is not designed or intended for base load generation. The EPS applies only to procurements that entail an annualized capacity factor in excess of 60 percent. With an expected operating capacity that is the equivalent of approximately 3,000 full-load hours per year, the project's annualized capacity factor will be less than 50 percent. Therefore, the SB 1368 limitation does not apply to this facility.

Deleted: 0.060

The compression-ignition engines proposed for the project comply with the CARB Airborne Toxic Control Measure for Stationary Compression Ignition Engines (CCR Title 17, §93115). As required by the ATCM, PM emissions will not exceed 0.15 g/hp-hr and each engine will be limited to 50 hours and 30 hours per year for testing and maintenance purposes for the emergency generators and fire pump engines, respectively.

5.1.6.3 Consistency with Local Requirements

The GBUAPCD has been delegated responsibility for implementing local, state, and federal air quality regulations in the Great Basin Valleys Air Basin. HHSEGS is subject to GBUAPCD regulations that apply to new stationary sources, to the prohibitory regulations that specify emission standards for individual equipment categories, and to the requirements for evaluation of impacts from non-criteria pollutants. The following sections include the evaluation of facility compliance with applicable GBUAPCD requirements.

New Source Review Requirements

The GBUAPCD's NSR rule (Rule 209-A Standards for Authorities to Construct) establishes the criteria for siting new and modified emission sources; this rule is applicable to the proposed project. There are three basic requirements within the NSR rules. First, BACT requirements must be applied at any new facility with potential emissions above specified threshold quantities. Second, all potential emission increases of nonattainment pollutants or precursors from the proposed source above specified thresholds must be offset by real, quantifiable, surplus, permanent, and enforceable emission decreases in the form of emission reduction credits (ERCs). Third, an ambient air quality impact analysis must be conducted to confirm that the project does not cause or contribute to a violation of a national or California AAQS or jeopardize public health.

BACT

A comparison of potential emissions with the BACT thresholds in GBUAPCD Rule 209-A is presented in Table 5.1-42R. GBUAPCD has indicated that exempt units and emergency units are not included in the determination of BACT requirements, so only total daily emissions from the auxiliary boilers and nighttime preservation boilers are included here.[26] This table shows that the boilers are not required to use BACT for NOx, VOC, SO_2 or PM_{10}.

Deleted: Table 5.1-41

Deleted: startup

TABLE 5.1-42R
Applicability of BACT Requirements Under NSR

Pollutant	BACT Threshold, lb/day	Facility Emissions, lb/day	BACT Required?
NOx	250	74	no
VOC	250	36	no
SO_2	250	7	no
PM_{10}	250	20	no

Deleted: **41**

Deleted: 240

Deleted: 117

Deleted: 47

Deleted: 111

Nevertheless, a detailed discussion regarding control technology options for these boilers is provided in Appendix 5.1C. A summary of the proposed controlled emission rates is provided in Table 5.1-43R.

Deleted: Table 5.1-42

TABLE 5.1-43R
Summary of Proposed Control Technologies

Pollutant	Control Technology	Concentration
NOx, boilers	ultra-low NOx burners	9 ppmc
CO	good combustion practices	25 to 50 ppmc
VOC	good combustion practices	12.6 ppmc
SO_2	natural gas fuel	—
$PM_{10}/PM_{2.5}$, boilers	natural gas fuel	—
$PM_{10}/PM_{2.5}$, WSACs	high-efficiency drift eliminators	0.0005% (drift rate)
GHGs	natural gas fuel supplementing solar generation	0.028 lb/MWh

Deleted: **42**

Deleted: 10 to

Deleted: 0.060

---

[26] The WSACs are exempt from permit requirements (Rule 201.D.4: water cooling towers not used for evaporative cooling of process water).

Deleted: nighttime preservation boilers are exempt from permit requirements (Rule 201.F: natural-gas-fired steam generators that have a maximum heat input rate of less than 15 MMBtu/hr); the

Deleted: also

Offsets

GBUAPCD Rule 209-A requires that projects with operational emissions above 250 pounds per day of NOx, VOC, PM_{10}, or SOx provide emission offsets by emission reductions from other sources. Based on emissions data presented in Table 5.1-42R above, daily emissions from the project will not exceed GBUAPCD's offset thresholds.

Deleted: Table 5.1-41

Air Quality Impact Analysis

Under the GBUAPCD new source review regulations (Rule 216), an air quality impact analysis must be performed to confirm that the emission increases for a project will not interfere with the attainment or maintenance of an applicable ambient air quality standard or cause additional violations of a standard anywhere the standard is already exceeded. The modeling results presented in Section 5.1.4.5 show that the proposed project will not interfere with the attainment or maintenance of the applicable air quality standards or cause additional violations of any standards.

New Source Review Requirements for Air Toxics

The GBUAPCD's Toxic Risk Assessment Policy describes the requirements and standards for assessing cancer risks from facilities that emit TACs. The rule requires a demonstration that the source will not exceed the applicable health risk thresholds. The project will comply with the requirements of this rule. An air toxics health risk assessment consistent with GBUAPCD requirements is provided in Section 5.9, Public Health.

New Source Performance Standards

The GBUAPCD's New Source Performance Standards (Regulation IX) incorporates the federal NSPS from 40 CFR Part 60. The applicability and requirements of and compliance with the New Source Performance Standards are discussed above under the federal regulations section.

Federal Programs and Permits

The federal Title IV acid rain program requirement and Title V operational permit requirements are in GBUAPCD's Rule 217. The applicability and requirements of and compliance with these programs and permits are discussed above under the federal regulations section.

Public Notification

Public notice under Rule 209-A.E (Power Plants) is required and the applicant expects the GBUAPCD Air Pollution Control Officer will provide this notice in a timely manner.

Permit Fees

The GBUAPCD requirements regarding permit fees are specified in Regulation III. This regulation establishes the filing and permit review fees for specific types of new sources, as well as annual renewal fees and penalty fees for existing sources. The project will pay the applicable fees in accordance with these requirements.

Prohibitions

The GBUAPCD prohibitions for specific types of sources and pollutants are addressed in Regulation IV. The prohibition rules that apply to the project are summarized below.

Rule 50 – Visible Emissions: This rule prohibits any source from discharging any emissions of any air contaminant that is darker in shade than that designated as Number 1 on the

Ringelmann Chart for a period or periods aggregating more than 3 minutes in any period of 60 consecutive minutes. The project's use of natural gas would eliminate the possibility of dark visible emissions. Therefore, the project is expected to comply with this requirement.

Rule 51 – Nuisance: This rule prohibits the discharge from a facility of air contaminants that cause injury, detriment, nuisance, or annoyance to the public, or cause damage to business or property. The project would not emit odorous pollutants, and the screening level health risk assessment included in the Public Health Section demonstrates that the potential health risk from the emissions is less than significant.

Rule 52 – Particulate Matter Emission Standards: This rule prohibits the discharge from any source of particulate matter in excess of 0.10 grain per dry standard cubic foot (0.23 grams per dry standard cubic meter) of gas. The project will have particulate matter emissions less than 0.23 grams per dry standard cubic meter and will thus comply with this rule.

Rule 62 – Sulfur Content of Fuels: This rule prohibits any stationary source from using any gaseous fuel containing more than 10 grains of sulfur compounds per 100 cubic feet of dry gaseous fuel. The natural gas used for the project will have a maximum sulfur content of 0.75 (short term) grains per 100 cubic feet of dry gaseous fuel, well below the limit under this rule.

5.1.7 Mitigation Measures

5.1.7.1 Operational Emissions: Permitted Units

The project's emissions are below the levels that require BACT or offsets under GBUAPCD regulations. Although BACT is not required, emissions from the boilers and engines will be well controlled, as discussed in Appendix 5.1C. Modeling shows that the project will not result in any significant air quality impacts.

Table 5.1-44R compares the emissions from the project with the emissions that would occur if the energy provided by the project were provided by a new 500 MW natural-gas-fired combined cycle turbine project operating 3,000 hours per year, utilizing Best Available Control Technology (assumptions: heat rate of 7,000 Btu/kWh, 2 ppmv NOx, 3 lb PM_{10} per 100 MW, 2 ppmv CO, 1.4 ppmv VOC, 0.0006 lb/MMBtu SO_2).

Deleted: Table 5.1-45

TABLE 5.1-44R

Comparison of Emissions Between HHSEGS and a Well-Controlled Gas Turbine

Deleted: **43**

Emissions/Equipment	Pollutant				
	NOx	SO_2	CO	VOC	$PM_{10}/PM_{2.5}$
Maximum Annual Emissions, total tons per year					
HHSEGS	8.3	0.8	12.9	3.1	2.1
Combined-Cycle Gas Turbine Project	48	3.2	23.1	8.4	22

Deleted: 12.3

Deleted: 1.8

Deleted: 30.2

Deleted: 4.8

Deleted: 4.4

5.1.7.2 Construction Activities

Mitigation measures for construction period impacts are discussed in Appendix 5.1F.

5.1.7.3 Greenhouse Gas Emissions

Every megawatt-hour generated by the project will displace a megawatt-hour that would otherwise have been generated by a more traditional (i.e., fossil-fuel-fired) source of electricity. The project therefore is expected to result in a net reduction in emissions of GHGs.

As discussed above, the project's GHG impacts are not significant. GHG regulatory offset requirements will be addressed through CARB-approved measures, including the possible acquisition of allowances under a cap-and-trade program.

5.1.7.4 Mirror Cleaning and Other Maintenance Activities

Emissions from mirror cleaning activities were quantified in Section 5.1.4.3. To minimize exhaust emissions from the mirror washing and refueling vehicles, the project will use new model year vehicles that meet then-current California on-road vehicle emission standards or applicable USEPA /California off-road engine emission standards for the model year in effect when the vehicles are purchased. To minimize fugitive dust emissions from maintenance operations, including travel of mirror washing vehicles on unpaved roads, a dust control plan will be prepared that includes fugitive dust control measures such as use of soil stabilization techniques and limits on vehicle speed. Mitigation measures that will be included in the operational dust control plan include the following:

- Operations and wind erosion control techniques, such as windbreaks and chemical dust suppressants, and ongoing maintenance procedures that will be used on areas that could be disturbed by vehicles or wind anywhere within the project boundaries; and
- Limitations on vehicles speeds to not more than 10 mph on unpaved roadways that are not stabilized and up to 25 mph on stabilized unpaved roads as long as such speeds to not create visible dust emissions.

5.1.8 Involved Agencies and Agency Contacts

Each level of government (state, federal, and county/local air district) has adopted specific regulations that limit emissions from stationary combustion sources, several of which are applicable to this project. The air agencies having permitting authority for this project are shown in Table 5.1-45. The applicable federal LORS and compliance with these requirements are discussed in more detail in Sections 5.1.2.1 and 5.1.6.1.

Deleted: Table 5.1-44

TABLE 5.1-45

Agency Contacts for Air Quality

Deleted: **44**

Issue	Agency	Contact
Permit issuance and oversight, enforcement	EPA Region 9	Gerardo Rios EPA Region 9 75 Hawthorne Street San Francisco, CA 94105 (415) 972-3974
Regulatory oversight	CARB	Mike Tollstrup Project Assessment Branch California Air Resources Board 1001 I Street Sacramento, CA 95812 (916) 323-8473
Permit issuance, enforcement	Great Basin Unified Air Pollution Control District	Duane Ono Deputy Air Pollution Control Officer GBUAPCD 157 Short Street Bishop, CA 93514 (760) 872-8211

5.1.9 Permits Required and Permit Schedule

Under Regulation II of its Rules and Regulations, GBUAPCD regulates the construction, alteration, replacement, and operation of new stationary emissions sources and modifications to existing sources. In addition, pursuant to its Rule 209-A.E Power Plants, GBUAPCD's Air Pollution Control Officer will conduct a DOC review upon receipt of the AFC for the project. This DOC for the project will be provided by GBUAPCD as part of the CEC review to confirm that the project will meet all of GBUAPCD's rules and regulations. A preliminary DOC (PDOC) is expected within approximately 180 days after GBUAPCD accepts the application as complete. The PDOC will be circulated for public comment, and a final DOC (FDOC) will be issued by the GBUAPCD after comment has been considered and addressed. Upon approval of the AFC by the CEC with conditions incorporating the requirements of the FDOC, the FDOC will confer upon the applicant all of the rights and privileges of an Authority to Construct (ATC). GBUAPCD will then assume responsibility for issuing and enforcing a Permit to Operate (PTO) for the project. This permitting process allows the GBUAPCD to adequately review new and modified air pollution sources to ensure compliance with all applicable prohibitory rules and to ensure that appropriate emission controls will be used. An ATC allows for the construction of the air pollution source and remains in effect until the PTO application is granted, denied, or canceled. Once the project has completed construction and commences operations, GBUAPCD will require verification that the project conforms to the ATC application and, following such verification, will issue a PTO. The PTO specifies conditions that the air pollution source must meet to comply with all air quality standards and regulations.

The GBUAPCD has also received delegation from EPA to administer the federal Title V programs for sources in the Great Basin Valley Air Basin. The HHSEGS must also submit a Title V permit application pursuant to GBUAPCD Rule 217.

Deleted: Title IV and

Deleted: HHSEGS will be exempt from many of the acid rain program requirements, but the project will be required to estimate SO_2 and CO_2 emissions from the project and to monitor NOx and O_2 emissions with a certified CEMS, and will submit an acid rain permit application 24 months prior to commencement of operation.

Deleted: within 12 months after commencement of plant operation

5.1.10 References

California Air Resources Board (CARB). 2007. Off-Road Mobile Source Emission Factors, Off-Road Emissions Inventory Program.

California Air Resources Board (CARB). 2010. ADAM Website (www.arb.ca.gov/adam/welcome.html). November.

California Energy Commission (CEC). 1997. "Regulations Pertaining to the Rules of Practice and Procedure and Plant Site Certification." Title 20, California Code of Regulations. Chapters 1, 2, and 5.

California Energy Commission (CEC). 2006. Rules of Practice and Procedure and Power Plant Site Certification Regulations Revisions, 04-SIT-2, December 14, 2006.

California Energy Commission (2007). 2007 Integrated Energy Policy Report – Scenario Analysis of California's Electricity System. http://www.energy.ca.gov/2007_energypolicy/documents/index.html.

California Energy Commission. Committee Report (08-GHG OII-01). Committee Guidance On Fulfilling California Environmental Quality Act Responsibilities For Greenhouse Gas Impacts In Power Plant Siting Applications. March 2009. http://www.energy.ca.gov/ghg_powerplants/documents/index.html.

California Energy Commission (2009). Framework for Evaluating Greenhouse Gas Implications of Natural Gas-Fired Power Plants in California, CEC-700- 2009-009-F, Prepared by: MRW and Associates. December 2009.

California Energy Commission (2009). Final Commission Decision for the Avenal Energy Plant (CEC-800-2009-006-CMF), December 2009.

Nevada Bureau of Air Quality Planning (2010). Ambient Air Quality Monitoring Program - Pahrump Air Quality, as updated October 20, 2010. http://ndep.nv.gov/baqp/monitoring/pahrumpmonitor2.html

San Joaquin Valley Air Pollution Control District. April 2010. Modeling Procedure to Address the New Federal 1 Hour NO_2 Standard.

San Joaquin Valley Air Pollution Control District (2010). *Procedure For Determining* NO_2 *Monitor Background Values (Design Values) For Use in Calculating NAAQS Compliance*. http://www.valleyair.org/busind/pto/Tox_Resources/NO2%20background%20Values.pdf

San Joaquin Valley Air Pollution Control District (2011). *EPA Background Files (Processing Notes)* http://www.valleyair.org/busind/pto/Tox_Resources/2011_Modeling/EPA-NO2/EPABackgroundFiles.pdf

Sierra Research. 2011 Modeling Protocol for the BrightSource Energy Hidden Hills Ranch Solar Electric Generating Station, Inyo County, California. Prepared for submittal to the

Great Basin Unified Air Pollution Control District and the California Energy Commission. April.

South Coast Air Quality Management District. 1993. CEQA Air Quality Handbook. April 1993.

U.S. Environmental Protection Agency (EPA). 1985. Guideline for Determination of Good Engineering Stack Height (Technical Support Document for the Stack Height Regulation) (Revised), EPA-450/4-80-023R. Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina. June 1985.

U.S. Environmental Protection Agency (EPA) (1990). *New Source Review Workshop Manual – Draft*. Office of Air Quality Planning and Standards, Research Triangle Park, NC.

U.S. Environmental Protection Agency (EPA) (1992a). *Procedures for Substituting Values for Missing NWS Meteorological Data for Use in Regulatory Air Quality Models*. Dennis Atkinson and Russell F. Lee, Office of Air Quality Planning and Standards, Research Triangle Park, NC. July 7, 1992.

U.S. Environmental Protection Agency (EPA). 1992b. Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised. EPA-454/R-92-019. October 1992.

U.S. Environmental Protection Agency (EPA). 1995a. Building Profile Input Program-Prime. Version 98086.

U.S. Environmental Protection Agency (EPA). 1995b. Screen3 Model User's Guide. EPA-454/B-95-004. September 1995.

U.S. Environmental Protection Agency (EPA). 1995c. User's Guide to the Building Profile Input Program (Revised), EPA-454/R-93-038, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina. February.

U.S. Environmental Protection Agency (EPA). 2000. Meteorological Monitoring Guidance for Regulatory Modeling Applications. February 2000.

U.S. Environmental Protection Agency (EPA). 2004. User's Guide for the AMS/EPA Regulatory Model-AERMOD. (EPA-454/B-03-001). September 2004.

U.S. Environmental Protection Agency (EPA) (2005). 40 CFR Part 51, Appendix W. *Guideline on Air Quality Models*. Last update November 9, 2005.

U.S. Environmental Protection Agency (EPA) (2009). OAQPS, AERMOD Implementation Workgroup, "AERMOD Implementation Guide," Last Revised: March 19, 2009.

U.S. Environmental Protection Agency (EPA) (2010a). OAQPS, Memo from Stephen D. Page, Director, to EPA Regional Modeling Contacts and others, "Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS," March 23, 2010.

U.S. Environmental Protection Agency (EPA) (2010b). OAQPS, Memo from Tyler Fox, Leader, Air Quality Modeling Group, to EPA Regional Air Division Directors, "Applicability of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard," June 28, 2010.

U.S. Environmental Protection Agency (EPA) (2010c). OAQPS, Memo from Stephen D. Page, Director, to EPA Regional Air Division Directors, "Guidance Concerning the Implementation of the 1-hour NO_2 NAAQS for the Prevention of Significant Deterioration Program," June 29, 2010.

U.S. Environmental Protection Agency (EPA) (2010d), OAQPS, Memo from Stephen D. Page, Director, to EPA Regional Air Division Directors, "Guidance Concerning the Implementation of the 1-hour SO_2 NAAQS for the Prevention of Significant Deterioration Program," August 23, 2010.

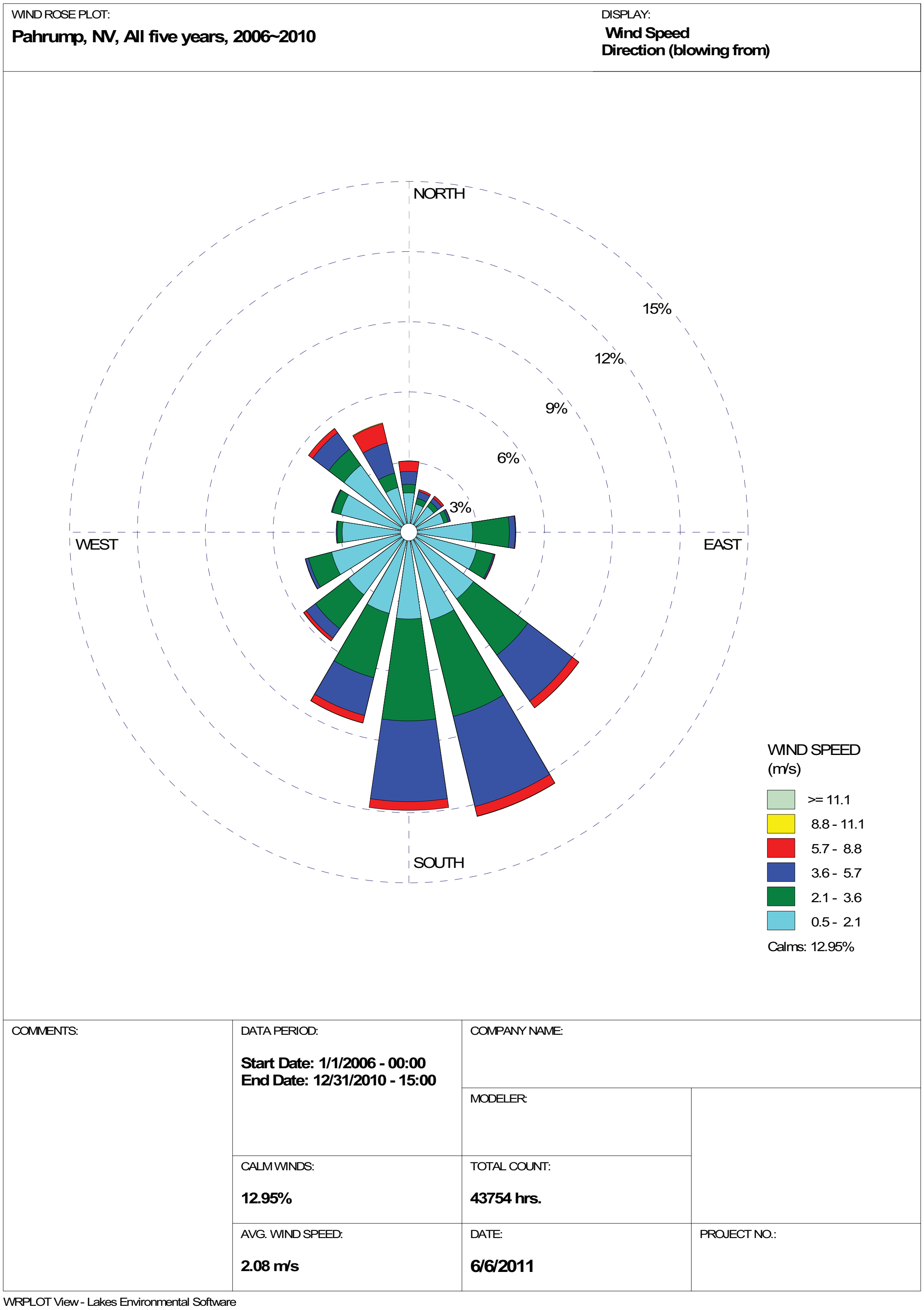
U.S. Environmental Protection Agency (EPA) (2010e). 75 FR 64864, "Prevention of Significant Deterioration (PSD) for Particulate Matter Less Than 2.5 Micrometers (PM2.5)—Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC)," October 20, 2010.

U.S. Environmental Protection Agency (EPA) (2011a). Memo from Tyler Fox, Leader, Air Quality Modeling Group, to EPA Regional Air Division Directors, "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard," March 1, 2011.

U.S. Environmental Protection Agency (EPA) (2011b). Technology Transfer Network, Support Center for Regulatory Atmospheric Modeling, Air Quality Models, AERMOD Release 11059 and latest guidance (Draft user's guide addenda dated 3/4/11). http://www.epa.gov/ttn/scram/

U.S. Environmental Protection Agency (EPA). 2011c. EPA AIRS Website (www.epa.gov/air/data/index.htm). March/April.

Western Regional Climate Center. 2007. Desert Research Institute, Las Vegas, NV (http://www.wrcc.dri.edu).



WIND ROSE PLOT:
Pahrump, NV, All five years, 2006~2010

DISPLAY:
Wind Speed
Direction (blowing from)

COMMENTS:

DATA PERIOD:
Start Date: 1/1/2006 - 00:00
End Date: 12/31/2010 - 15:00

COMPANY NAME:

MODELER:

CALM WINDS:
12.95%

TOTAL COUNT:
43754 hrs.

AVG. WIND SPEED:
2.08 m/s

DATE:
6/6/2011

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Source: Sierra Research, 2011.

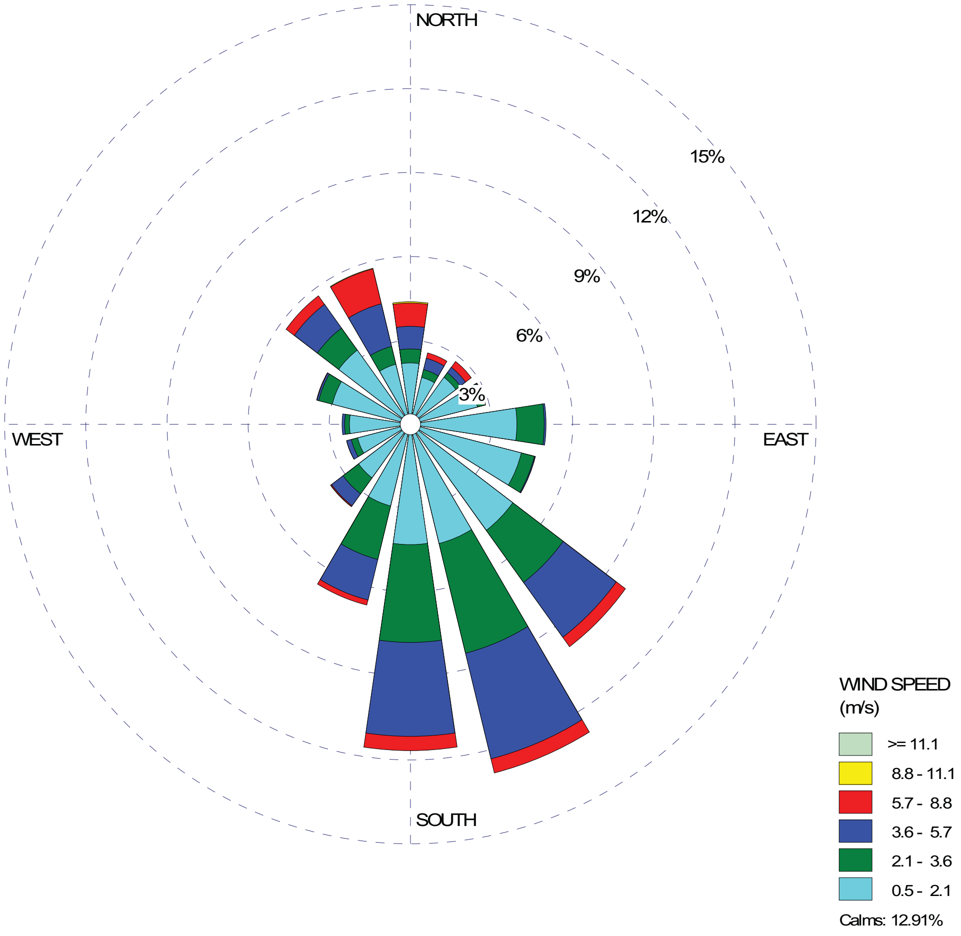
FIGURE 5.1-1
Composite Wind Rose for Pahrump, Nevada: Annual, 2006-2010
Hidden Hills Solar Electric Generating System

WIND ROSE PLOT:

Pahrump, NV, 1st Quarter, 2006~2010

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

DATA PERIOD:

Start Date: 1/1/2006 - 00:00
End Date: 3/31/2010 - 23:00

COMPANY NAME:

MODELER:

CALM WINDS:

12.91%

TOTAL COUNT:

10816 hrs.

AVG. WIND SPEED:

2.06 m/s

DATE:

6/6/2011

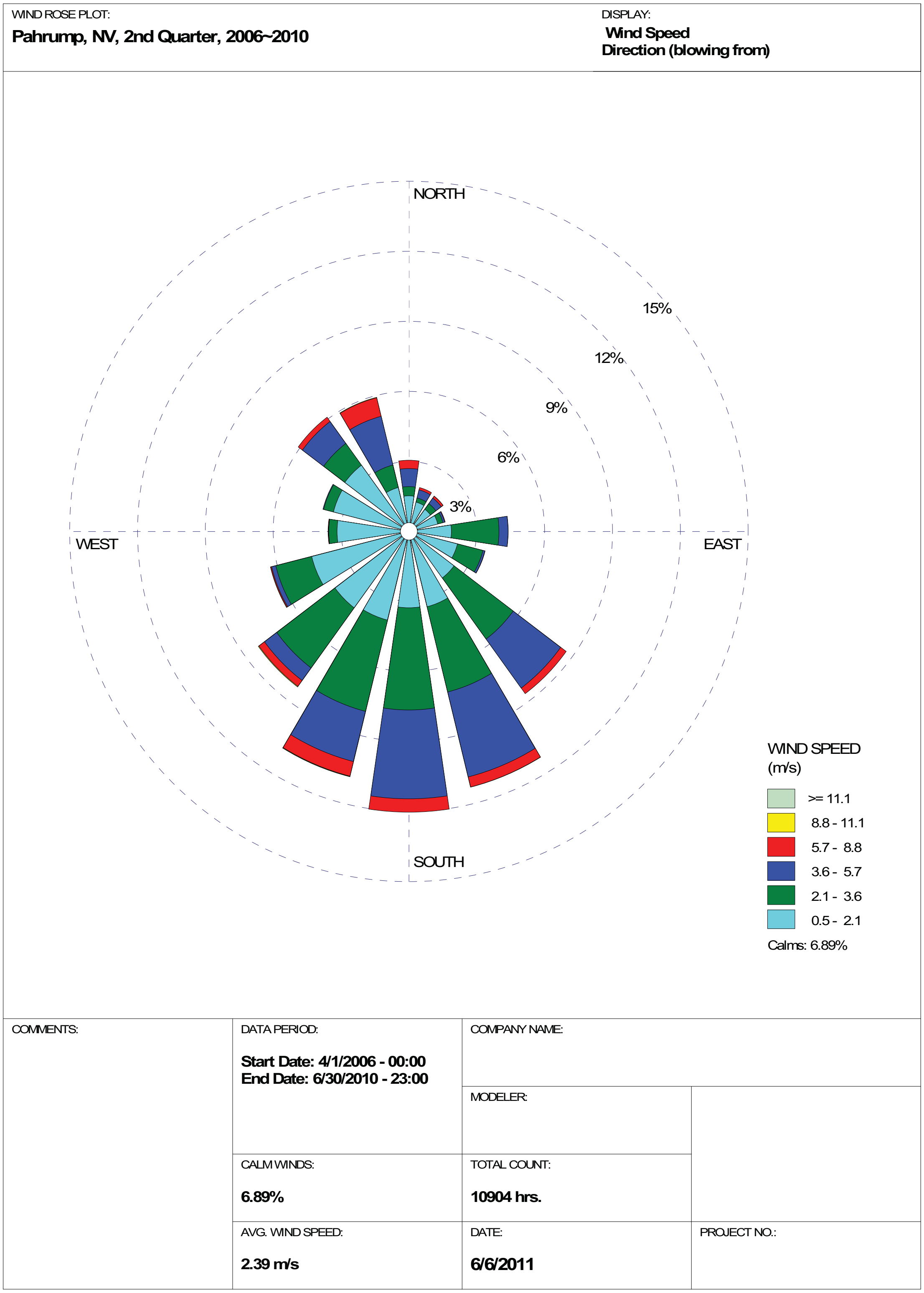
PROJECT NO.:

WRPLOT View - Lakes Environmental Software

FIGURE 5.1-2
Composite Wind Rose for Pahrump, Nevada: First Quarter, 2006-2010

Hidden Hills Solar Electric Generating System

Source: Sierra Research, 2011.



WIND ROSE PLOT:

Pahrump, NV, 2nd Quarter, 2006~2010

DISPLAY:

Wind Speed
Direction (blowing from)

COMMENTS:

DATA PERIOD:

Start Date: 4/1/2006 - 00:00
End Date: 6/30/2010 - 23:00

COMPANY NAME:

MODELER:

CALM WINDS:

6.89%

TOTAL COUNT:

10904 hrs.

AVG. WIND SPEED:

2.39 m/s

DATE:

6/6/2011

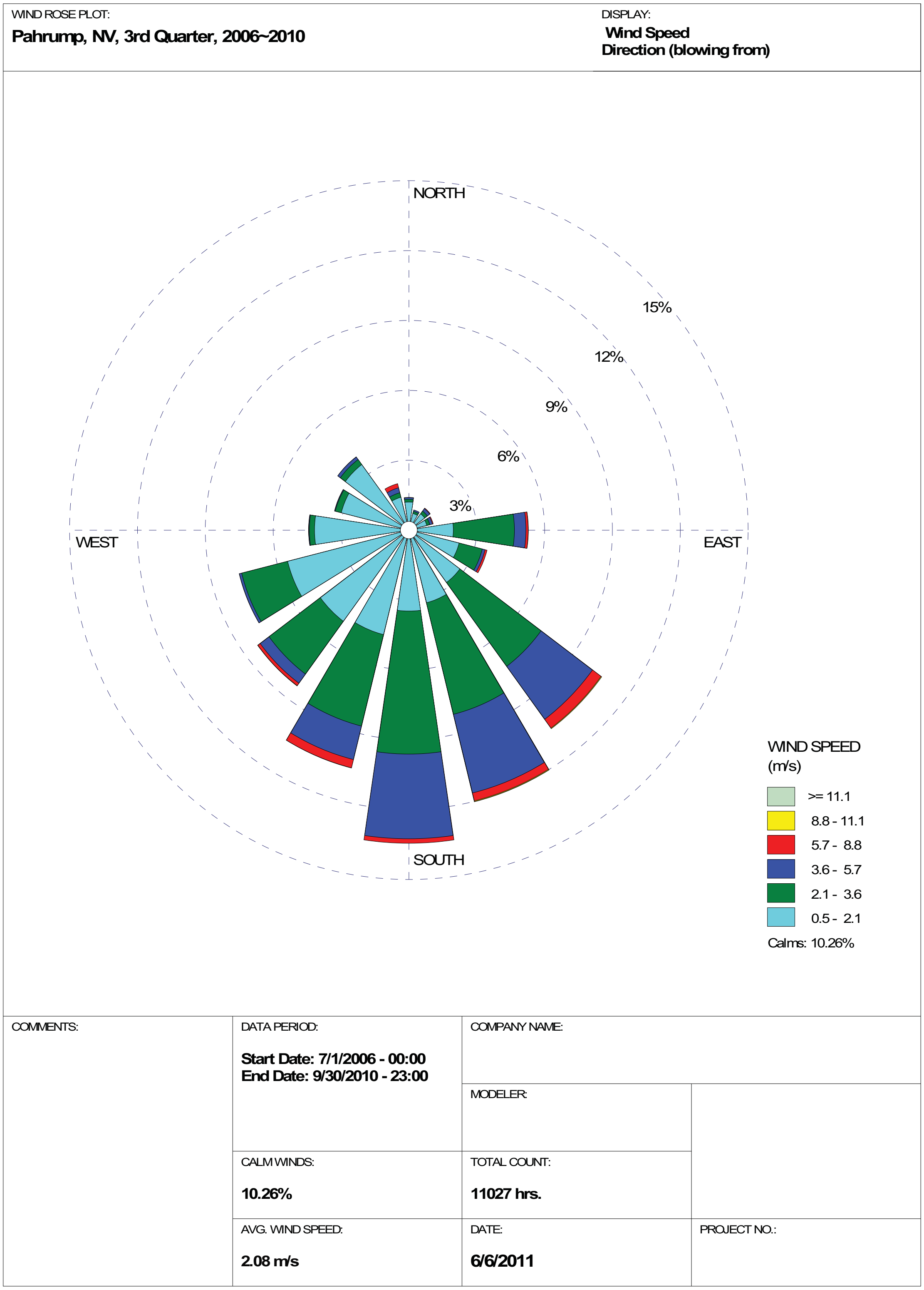
PROJECT NO.:

WRPLOT View - Lakes Environmental Software

FIGURE 5.1-3
Composite Wind Rose for Pahrump, Nevada: Second Quarter, 2006-2010

Hidden Hills Solar Electric Generating System

Source: Sierra Research, 2011.



WIND ROSE PLOT:

Pahrump, NV, 3rd Quarter, 2006~2010

DISPLAY:

Wind Speed
Direction (blowing from)

COMMENTS:

DATA PERIOD:

Start Date: 7/1/2006 - 00:00
End Date: 9/30/2010 - 23:00

COMPANY NAME:

MODELER:

CALM WINDS:

10.26%

TOTAL COUNT:

11027 hrs.

AVG. WIND SPEED:

2.08 m/s

DATE:

6/6/2011

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Source: Sierra Research, 2011.

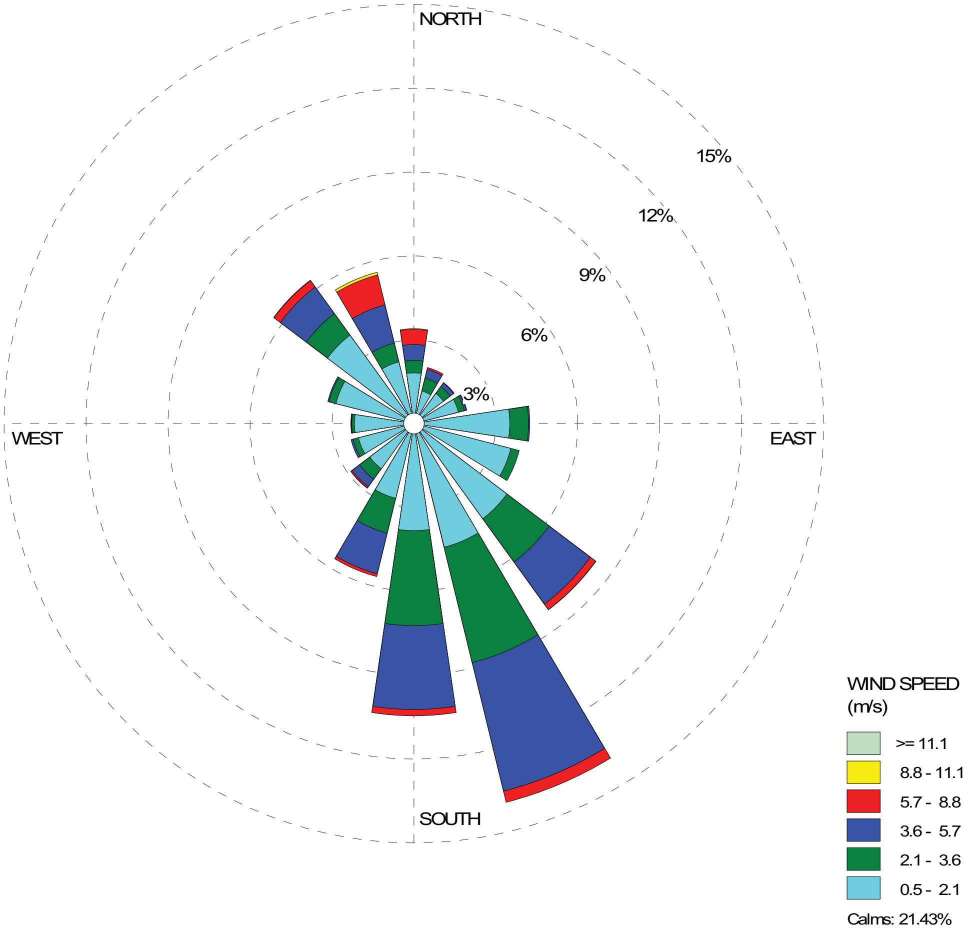
FIGURE 5.1-4
Composite Wind Rose for Pahrump, Nevada: Third Quarter, 2006-2010
Hidden Hills Solar Electric Generating System

WIND ROSE PLOT:

Pahrump, NV, 4th Quarter, 2006~2010

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

DATA PERIOD:

Start Date: 10/1/2006 - 00:00
End Date: 12/31/2010 - 15:00

COMPANY NAME:

MODELER:

CALM WINDS:

21.43%

TOTAL COUNT:

11007 hrs.

AVG. WIND SPEED:

1.77 m/s

DATE:

6/6/2011

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

FIGURE 5.1-5
Composite Wind Rose for Pahrump, Nevada: Fourth Quarter, 2006-2010
Hidden Hills Solar Electric Generating System

Source: Sierra Research, 2011.

Aerial image courtesy of Google™ Earth, 2011. Images ©2011 DigitalGlobe, USDA Farm Service Agency.

FIGURE 5.1-6
Locations of the Ambient Monitoring Stations
Hidden Hills Solar Electric Generating System

AFC Appendix 5.1, Air Quality
(Revised April 2012)

Appendix 5.1: Air Quality (Revised April 2012)

The following briefly describes changes made to Air Quality Appendices 5.1A through 5.1H as a result of the boiler optimization.

- Appendix 5.1A, Quarterly Wind Roses and Wind Frequency Distributions: no changes
- Appendix 5.1B, Emissions and Operating Parameters: completely revised
- Appendix 5.1C, Emission Control Technology Assessment: no changes
- Appendix 5.1D, Ambient Air Quality Modeling Analysis: completely revised
- Appendix 5.1E, Screening Health Risk Assessment: changes shown in ~~strikeout~~/underline, tables and figures revised
- Appendix 5.1F, Construction Emissions and Impact Analysis: Data Response 8 from CEC Staff Data Request Set 1A added, no other changes
- Appendix 5.1G, Cumulative Impacts Analysis: Data Responses 2 and 3 from CEC Staff Data Request Set 1A added, no other changes
- Appendix 5.1H, Modeling Protocol and Related Correspondence: no changes

Appendix 5.1B

Revised April 2012

Emissions and Operating Parameters

Table 5.1B-1R
Emissions and Operating Parameters for the Auxiliary Boilers
Hidden Hills Solar Electric Generating System

Eliminated from project design: April 2012

Boiler Emission Characteristics				
		Normal	Hot Standby	Cold Startup
Heat Input, MMBtu/hr (HHV)		500.0		
Boiler Rating, lb/hr		350,000		
NOx, ppmvd @ 3% O2				
CO, ppmvd @ 3% O2				
VOC (as CH4), ppmvd @ 3% O2				
NOx (as NO2), lb/hr				
NOx, lb/MMBtu				
CO, lb/hr				
CO, lb/MMBtu				
VOC (as CH4), lb/hr				
VOC, lb/MMBtu				
PM10, lb/hr				
PM10, lb/MMBtu				
SO2, grains/100 scf				
SO2, lb/hr				
SO2, lb/MMBtu				
Boiler Stack Parameters				
Exhaust temp	deg F			
Exhaust volume	cfm			
Stack diameter	inches			
Exhaust velocity	ft/sec			

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*		

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	*3.00*		
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*		

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*		

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 design.

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

		Operating Hours, Each Unit						Annual Startup Hours, Each	Rated Hourly Fuel Use, MMBtu
	Number of Units	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-9R
Calculation of Daily and Annual Fuel Use
Hidden Hills Solar Electric Generating System
Revised April 2012

	Number of Units	Operating Hours, Each Unit						Annual Startup Hours, Each	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

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
PM10/PM2.5 (combustion)	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)
3. Assume all combustion PM10 is <2.5 um in size
4. Assume all engines are diesel fueled so all combustion PM is DPM
5.GHG emission factors from CARB Regulation for the Mandatory reporting of Greenhouse Gas Emissions, December 2, 2008; distillate fuel
6. 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

Calculations for Maximum Hourly, Daily and Annual 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	0.002	1.1	0.1	0.07	0.1
Power Block Fire Pump Engines	2	0.5	1.6	1.3	0.003	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	0.03
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	0.066	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	*31,902*	*0.60*	*0.06*	--		
Nighttime Preservation Boilers	2	*15.0*	n/a	*4780*	*345*	*144,700*	n/a	*7,672*	*0.14*	*0.01*	--		
Power Block Emergency Generators	2	*23.8*	n/a	200	n/a	*9,520*	n/a	*704*	*0.03*	*0.01*	--		
Common Area Emergency Generator	1	2.72	n/a	200	n/a	*550*	n/a	*41*	*1.7E-03*	*3.3E-04*	--		
Power Block Fire Pump Engines	2	*1.63*	n/a	200	n/a	*660*	n/a	*49*	*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	6	--	n/a	8760	n/a	*0*	n/a	--	--	--	2.0E-03		
Total			--	--		*757,500*	*1,432,000*	*40,392*	*0.78*	*0.08*	2.0E-03		
CO2-Equivalent								*40,392*	*16.37*	*25.20*	47.82	*44,530*	*62*

Natural Gas GHG Emission Rates (2)

Fuel	Emission Factors, kg/MMBtu			Emission Factor
	CO2 (3)	CH4 (4)	*N2O (4)*	SF6 (6)
Natural Gas	*53.020*	*1.00E-03*	1.00E-04	n/a
Diesel Fuel	*73.960*	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," Amended 12/16/10; effective 1/1/12. http://www.arb.ca.gov/regact/2010/ghg2010/ghg2010.htm
3. 40 CFR 98, Table C-1
4. 40 CFR 98, Table C-1
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-14R

Calculation of Noncriteria Pollutant Emissions from Auxiliary Boilers

Hidden Hills Solar Electric Generating System

Large auxiliary boilers eliminated from project design: 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			
Hazardous Air Pollutants				
Acetaldehyde	9.0E-04			
Acrolein	8.0E-04			
Benzene	1.7E-03			
Ethylbenzene	2.0E-03			
Formaldehyde	3.6E-03			
Hexane	1.3E-03			
Naphthalene	3.0E-04			
PAHs (except naphthalene) (4)	1.0E-04			
Toluene	7.8E-03			
Xylene	5.8E-03			
Total HAPs				

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 - MMscf/hr

(3) Based on total annual heat input of 0.0 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.

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.

<u>Speciated PAHs (except naphthalene)</u>

	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

		Maximum Hourly	Annual Emissions (3)	
Compound	Emission Factor, lb/MMscf (1)	Emissions, lb/hr per boiler(2)	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.

<u>Speciated PAHs (except naphthalene)</u>

	Mean EF	Adjusted EF	Emissions	
	(Note 1)	(Note 5)	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-17R
Calculation of Noncriteria Pollutant Emissions from WSACs
Hidden Hills Solar Electric Generating System

Revised April 2012

Constituent	Concentration in Cooling Tower Return Water (2)	Emissions (1)		
		Emissions, lb/hr	Emissions, ton/yr	Emissions, lbs/year
Ammonia	0 ppm	0.0E+00	0.0E+00	0.0
Copper	0.01 ppm	*1.0E-07*	*1.0E-07*	0.0
Silver	0 ppm	0.0E+00	0.0E+00	0.0
Zinc	0 ppm	0.0E+00	0.0E+00	0.0
Hazardous Air Pollutants				
Arsenic	0 ppm	0.0E+00	0.0E+00	0.0
Beryllium	0.0025 ppm	*2.5E-08*	*2.5E-08*	0.0
Cadmium	0 ppm	0.0E+00	0.0E+00	0.0
Chromium (III)	0 ppm	0.0E+00	0.0E+00	0.0
Lead	0 ppm	0.0E+00	0.0E+00	0.0
Mercury	0 ppm	0.0E+00	0.0E+00	0.0
Nickel	0 ppm	0.0E+00	0.0E+00	0.0
Dioxins/furans	-- ppm	--	--	--
PAHs	--	--	--	--
Total HAPs			*2.5E-08*	*5.0E-05*

Notes:

1. Emissions calculated from maximum drift rate *10.00* lb/hr and 2,000 hrs/yr of operation.
2. Based on assumed 20 cycles of concentration

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	6	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
		2	4		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	

Appendix 5.1D

Revised April 2012

Ambient Air Quality Modeling Analysis

Table 5.1D-1R
Building Dimensions Used for Modeling
Hidden Hills Solar Electric Generating System
Revised April 2012

Structure	Dimensions (meters)		
	Height	Length	Width
Common Area			
Administration, Warehouse and Shop Building	6.71	99.06	25.99
Fire Water Pump House	3.96	11.34	4.82
Mirror Wash Machine Maintenance Shed	7.32	30.48	24.38
Emergency Diesel Generator Enclosure	2.13	4.57	1.83
MCC Transformers	3.96	5.18	3.96
	Height	Diameter	
Fire/Service Water Storage Tank	9.75	10.06	
Power Block #1			
	Height	Length	Width
Mirror Wash Covered Parking	6.10	91.44	16.76
Plant Services Building	4.57	26.82	12.19
Plant Electrical Building	9.14	40.23	11.58
Water Treatment Building	9.14	23.69	13.80
Deaerator/Feedwater Heater Steel Support Structure	39.62	49.38	13.11
Air Cooled Condenser	36.58	94.49	66.45
Generator Step-up Transformer	7.62	17.68	12.19
Unit Auxiliary Transformer	4.27	7.62	7.32
Steam Turbine Generator	13.72	33.53	14.02
Fin-Fan Dry Coolers	4.11	24.38	18.29
WSAC (Wet Surface Air Cooler)	3.35	14.63	10.67
Emergency Diesel Generator	3.05	9.14	2.74
Fire pump enclosure	3.96	11.35	4.96
MCC Transformers 1	2.44	10.36	3.96
MCC Transformers 2	2.44	5.18	3.96
Station Service Transformer	2.13	4.57	3.66
Water Treatment Module/WSAC	4.88	14.94	7.62
Solar Tower Base Module	4.88	9.45	3.05
Boiler Feedwater Pump Module	4.88	14.94	4.57
Aux Blr/Fuel Gas Module	4.88	18.66	4.40
Aux Boiler Enclosure	7.62	23.77	20.73
Night Boiler Enclosure	4.27	7.62	4.57

Structure	Dimensions (meters)		
	Height	Diameter	
Solar Receiver Tower	228.60	21.95	
Demineralized Water Tank	9.75	9.14	
Treated Water Storage Tank	9.75	10.36	
Waste Water Collection Tank	7.62	4.27	
Service/Fire Water Tank	9.75	10.36	
Potable Water Storage Tank	1.83	2.74	
Potable Water Treatment System Feed Tank	2.44	3.05	
Wastewater Residue Tank	3.05	3.66	
Power Block #2			
	Height	Length	Width
Mirror Wash Covered Parking	6.10	91.44	16.76
Plant Services Building	4.57	26.82	12.19
Plant Electrical Building	9.14	40.23	11.58
Water Treatment Building	9.14	23.69	13.80
Deaerator/Feedwater Heater Steel Support Structure	39.62	49.38	13.11
Air Cooled Condenser	36.58	94.49	66.45
Generator Step-up Transformer	7.62	17.68	12.19
Unit Auxiliary Transformer	4.27	7.62	7.32
Steam Turbine Generator	13.72	33.53	14.02
Fin-Fan Dry Coolers	4.11	24.38	18.29
WSAC (Wet Surface Air Cooler)	3.35	14.63	10.67
Emergency Diesel Generator	3.05	9.14	2.74
Fire pump enclosure	3.96	11.35	4.96
MCC Transformers 1	2.44	10.36	3.96
MCC Transformers 2	2.44	5.18	3.96
Station Service Transformer	2.13	4.57	3.66
Water Treatment Module/WSAC	4.88	14.94	7.62
Solar Tower Base Module	4.88	9.45	3.05
Boiler Feedwater Pump Module	4.88	14.94	4.57
Aux Blr/Fuel Gas Module	4.88	18.66	4.40
Aux Boiler Enclosure	7.62	23.77	20.73
Night Boiler Enclosure	4.27	7.62	4.57

Structure	Dimensions (meters)	
	Height	Diameter
Solar Receiver Tower	228.60	21.95
Demineralized Water Tank	9.75	9.14
Treated Water Storage Tank	9.75	10.36
Waste Water Collection Tank	7.62	4.27
Service/Fire Water Tank	9.75	10.36
Potable Water Storage Tank	1.83	2.74
Potable Water Treatment System Feed Tank	2.44	3.05
Wastewater Residue Tank	3.05	3.66

FIGURE 5.1D-1R
Structures and Emission Sources in the Common Area

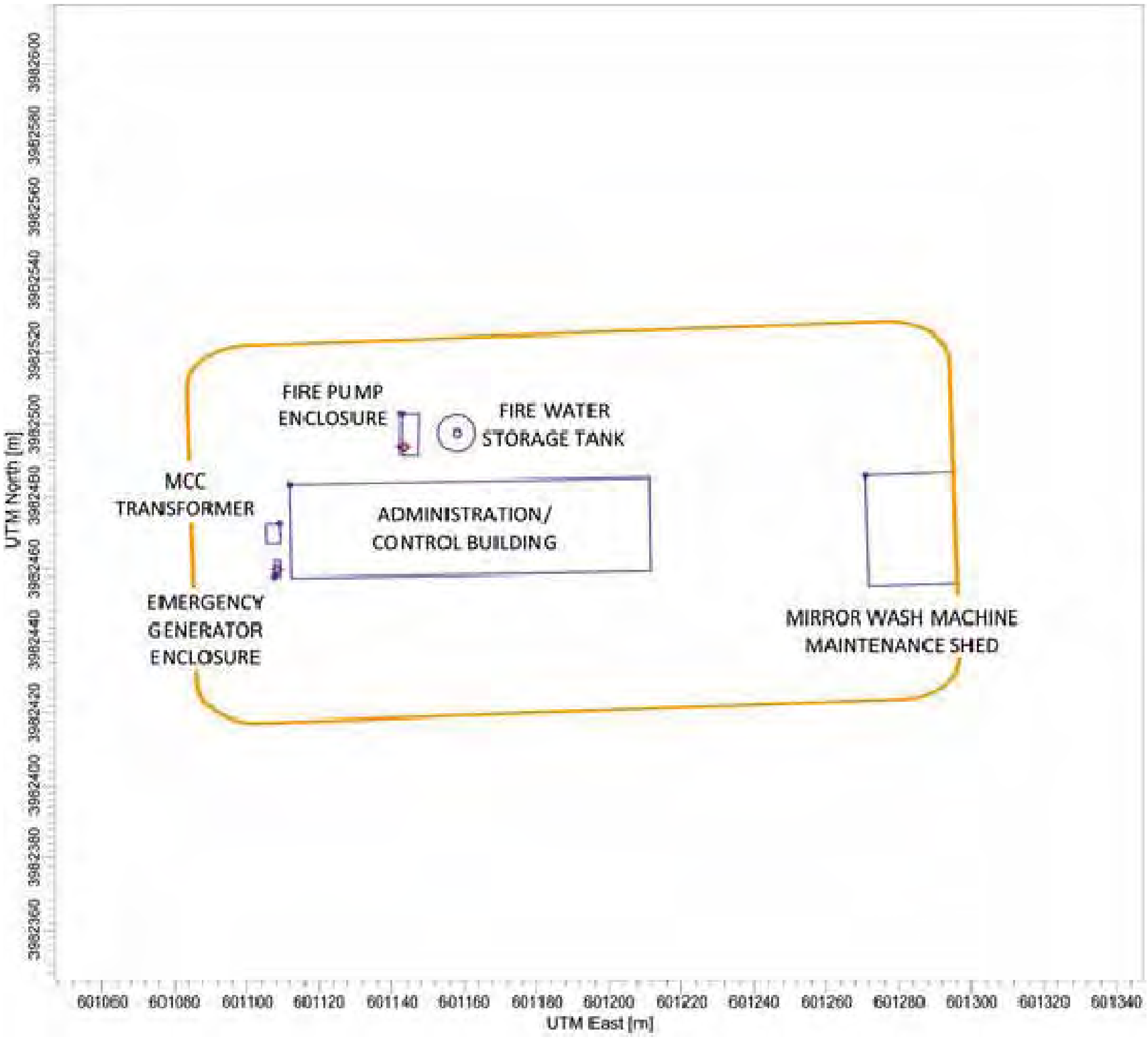


FIGURE 5.1D-2R
Structures and Emission Sources in the Power Blocks

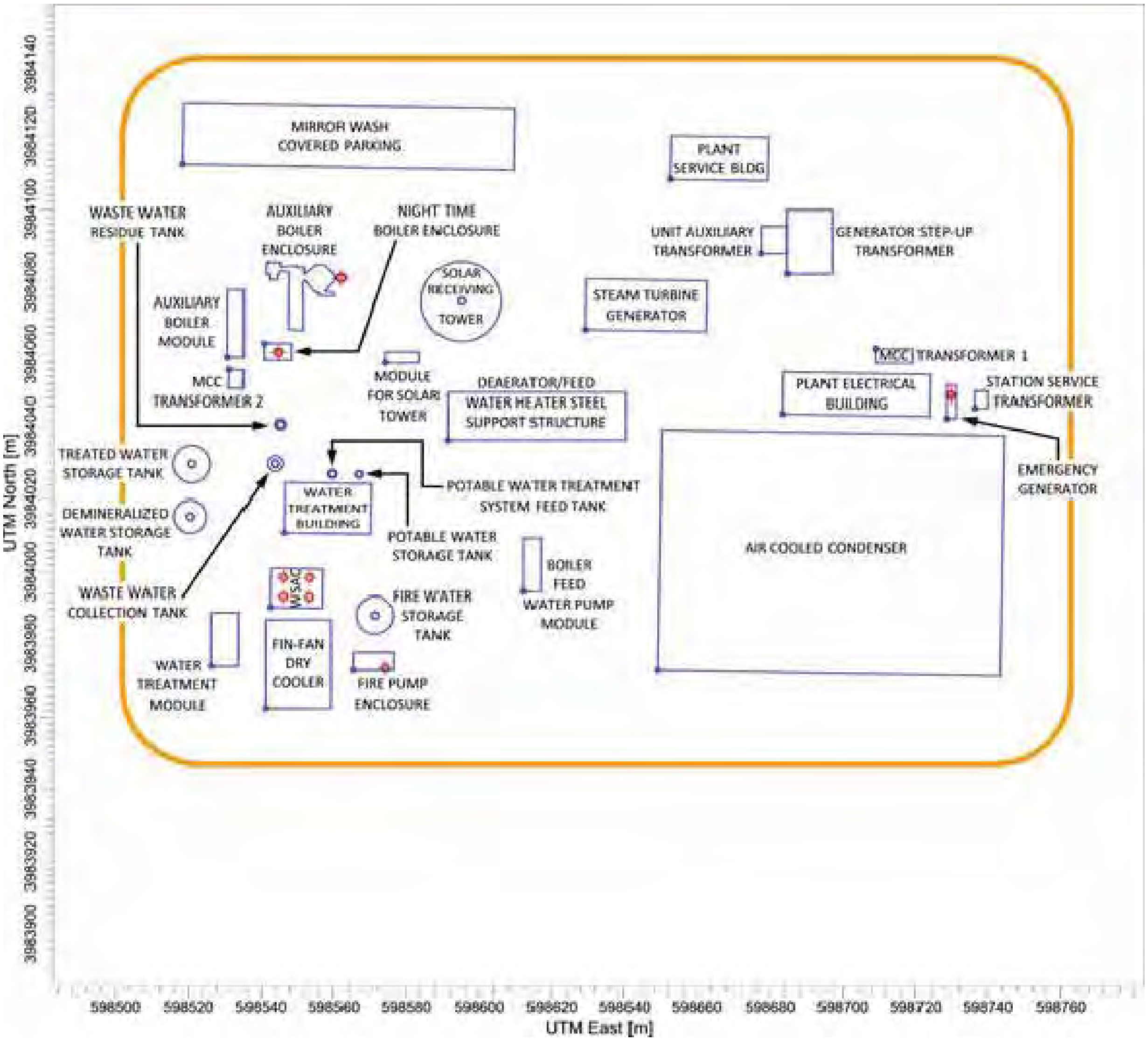


FIGURE 5.1D-3 (NEW)
Overview of Emissions Sources in Power Blocks and Common Area

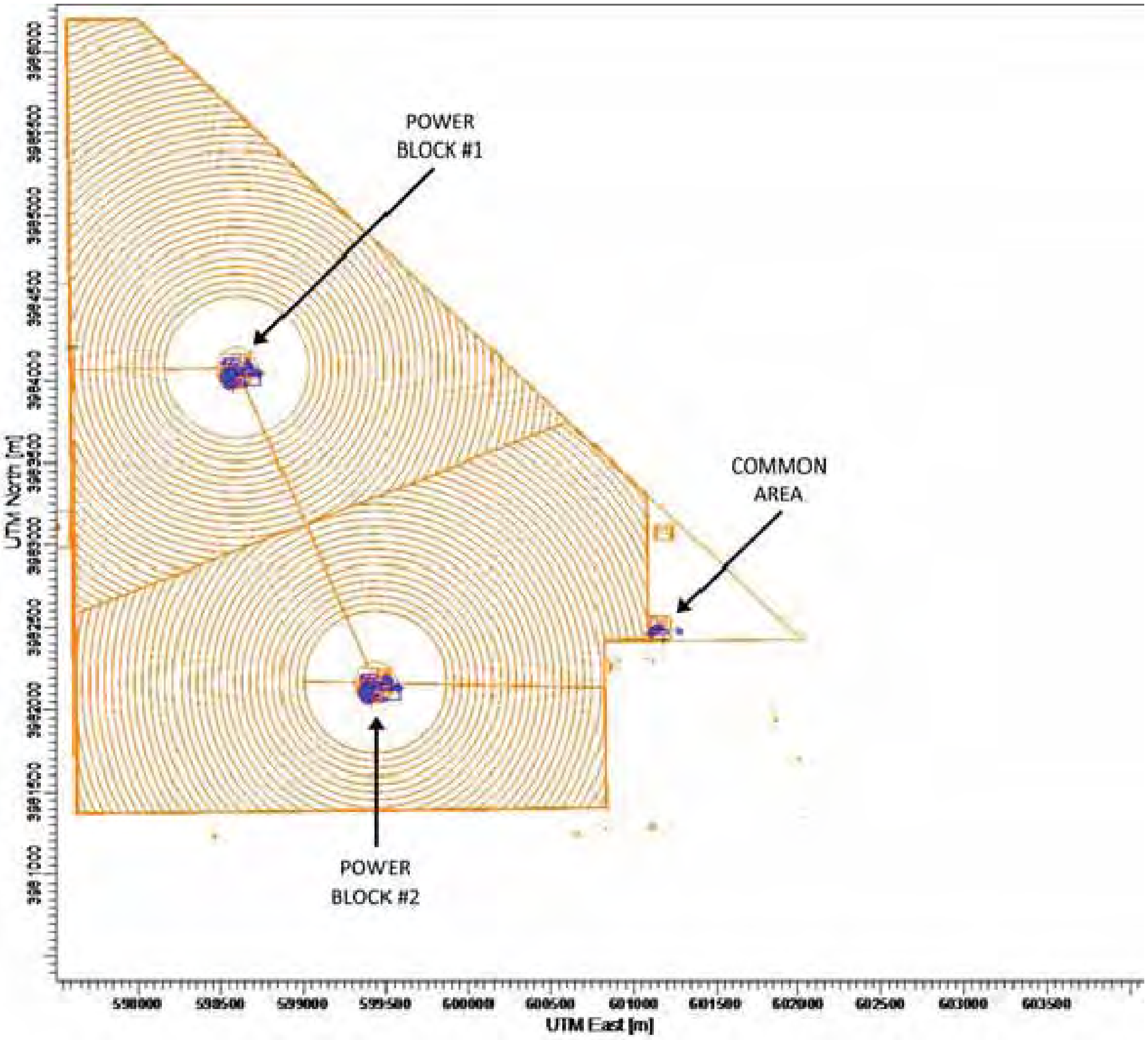


Table 5.1D-2R
Emission Rates and Stack Parameters for Refined Modeling
Hidden Hills Solar Electric Generating System
Revised Apri 2012

	Stack Diam, m	Release Height m	Temp, deg K	Exhaust Flow, m3/s	Exhaust Velocity, m/s	Emission Rates, g/s			
						NOx	SO2	CO	PM10
Averaging Period: One hour									
Auxiliary Boilers	1.676	41.148	421.89	34.181	15.486	0.3452	6.591E-02	0.5736	n/a
Nighttime Preservation Boilers	0.457	9.144	421.89	2.059	12.543	2.142E-02	3.971E-03	6.911E-02	n/a
PB emergency generators (each)	0.457	5.486	769.11	9.250	56.344	2.422	2.316E-03	1.3119	n/a
PB fire pump engines (each)	0.102	4.572	796.89	0.779	96.051	8.333E-02	1.588E-04	7.222E-02	n/a
Common Area em generator	0.203	5.486	730.22	1.062	32.745	1.658E-01	2.646E-04	1.437E-01	n/a
Common Area fire pump engine	0.102	4.572	796.89	0.779	96.051	8.333E-02	1.588E-04	7.222E-02	n/a
Averaging Period: Three hours									
Auxiliary Boilers	1.676	41.148	421.89	34.181	15.486	n/a	6.591E-02	n/a	n/a
Nighttime Preservation Boilers	0.457	9.144	421.89	2.059	12.543	n/a	3.971E-03	n/a	n/a
PB emergency generators (each)	0.457	5.486	769.11	9.250	56.344	n/a	7.719E-04	n/a	n/a
PB fire pump engines (each)	0.102	4.572	796.89	0.779	96.051	n/a	5.293E-05	n/a	n/a
Common Area em generator	0.203	5.486	730.22	1.062	32.745	n/a	8.821E-05	n/a	n/a
Common Area fire pump engine	0.102	4.572	796.89	0.779	96.051	n/a	5.293E-05	n/a	n/a
Averaging Period: Eight hours									
Auxiliary Boilers	1.676	41.148	421.89	34.181	15.486	n/a	n/a	5.736E-01	n/a
Nighttime Preservation Boilers	0.457	9.144	421.89	2.059	12.543	n/a	n/a	6.911E-02	n/a
PB emergency generators (each)	0.457	5.486	769.11	9.250	56.344	n/a	n/a	1.640E-01	n/a
PB fire pump engines (each)	0.102	4.572	796.89	0.779	96.051	n/a	n/a	9.028E-03	n/a
Common Area em generator	0.203	5.486	730.22	1.062	32.745	n/a	n/a	1.797E-02	n/a
Common Area fire pump engine	0.102	4.572	796.89	0.779	96.051	n/a	n/a	9.028E-03	n/a
Averaging Period: 24 hours									
Auxiliary Boilers	1.676	41.148	421.89	34.181	15.486	n/a	1.663E-02	n/a	4.494E-02
Nighttime Preservation Boilers	0.457	9.144	421.89	2.059	12.543	n/a	2.668E-03	n/a	6.399E-03
PB emergency generators (each)	0.457	5.486	769.11	9.250	56.344	n/a	9.648E-05	n/a	3.154E-03
PB fire pump engines (each)	0.102	4.572	796.89	0.779	96.051	n/a	6.616E-06	n/a	1.736E-04
Common Area em generator	0.203	5.486	730.22	1.062	32.745	n/a	1.103E-05	n/a	3.455E-04
Common Area fire pump engine	0.102	4.572	796.89	0.779	96.051	n/a	6.616E-06	n/a	1.736E-04
WSACs (8 cells, per cell)	2.743	3.658	299.67	69.612	11.778	n/a	n/a	n/a	2.362E-04
Averaging Period: Annual									
Auxiliary Boilers	1.676	41.148	421.89	34.181	15.486	7.744E-02	9.193E-03	n/a	2.357E-02
Nighttime Preservation Boilers	0.457	9.144	421.89	2.059	12.543	1.253E-02	2.186E-03	n/a	5.250E-03
PB emergency generators (each)	0.457	5.486	769.11	9.250	56.344	2.765E-02	2.643E-05	n/a	8.640E-04
PB fire pump engines (each)	0.102	4.572	796.89	0.779	96.051	9.513E-04	1.813E-06	n/a	4.756E-05
Common Area em generator	0.203	5.486	730.22	1.062	32.745	1.893E-03	3.021E-06	n/a	9.465E-05
Common Area fire pump engine	0.102	4.572	796.89	0.779	96.051	9.513E-04	1.813E-06	n/a	4.756E-05
WSACs (8 cells, per cell)	2.743	3.658	299.67	69.612	11.778	n/a	n/a	n/a	1.078E-04

Table 5.1D-3R

Hidden Hills Solar Electric Generating System

Emission Rates and Stack Parameters for Boilers in Startup

Revised April 2012

	Stack Diam, m	Release Height m	Temp, deg K	Exhaust Flow, m3/s	Exhaust Velocity, m/s	Emission Rates, g/s			
						NOx	SO2	CO	PM10
Auxiliary Boilers in startup; Nighttime Preservation Boilers in operation									
Averaging Period: One hour									
Auxiliary Boiler	1.676	41.148	421.89	4.720	2.138	0.3452	9.281E-03	0.574	n/a
Nighttime Pres. Boiler	0.457	9.144	421.89	2.059	12.543	0.0214	3.971E-03	0.069	n/a
Averaging Period: Three hours									
Auxiliary Boiler	1.676	41.148	421.89	4.720	2.138	n/a	9.281E-03	n/a	n/a
Nighttime Pres. Boiler	0.457	9.144	421.89	2.059	12.543	n/a	3.971E-03	n/a	n/a
Averaging Period: Eight hours									
Auxiliary Boiler	1.676	41.148	421.89	4.720	2.138	n/a	n/a	0.574	n/a
Nighttime Pres. Boiler	0.457	9.144	421.89	2.059	12.543	n/a	n/a	0.069	n/a
Nighttime Pres. Boilers in startup; Auxiliary Boilers in operation									
Averaging Period: One hour									
Auxiliary Boiler	1.676	41.148	421.89	34.181	15.486	0.3452	6.591E-02	0.574	n/a
Nighttime Pres. Boiler	0.457	9.144	421.89	0.284	1.732	0.0214	4.963E-04	0.069	n/a
Averaging Period: Three hours									
Auxiliary Boiler	1.676	41.148	421.89	34.181	15.486	n/a	6.591E-02	n/a	n/a
Nighttime Pres. Boiler	0.457	9.144	421.89	0.284	1.732	n/a	4.963E-04	n/a	n/a
Averaging Period: Eight hours									
Auxiliary Boiler	1.676	41.148	421.89	34.181	15.486	n/a	n/a	0.574	n/a
Nighttime Pres. Boiler	0.457	9.144	421.89	0.284	1.732	n/a	n/a	0.069	n/a

Table 5.1D-4

Emission Rates and Stack Parameters for Aux Boilers on Hot Standby

Hidden Hills Solar Electric Generating System

Large auxiliary boilers eliminated from project design: April 2012

						Emission Rates, g/s			
	Stack Diam, m	Release Height m	Temp, deg K	Exhaust Flow, m3/s	Exhaust Velocity, m/s	NOx	SO2	CO	PM10
Averaging Period: One hour, all aux boilers on hot standby									
~~Aux Boilers~~	~~2.083~~	~~36.576~~	~~455.22~~	~~8.319~~	~~2.442~~	~~0.3784~~	~~6.624E-03~~	~~0.576~~	~~n/a~~
Averaging Period: Three hours, all aux boilers on hot standby									
~~Aux Boilers~~	~~2.083~~	~~36.576~~	~~455.22~~	~~8.319~~	~~2.442~~	~~n/a~~	~~6.624E-03~~	~~n/a~~	~~n/a~~
Averaging Period: Eight hours, all aux boilers on hot standby									
Aux Boilers	~~2.083~~	~~36.576~~	~~455.22~~	~~8.319~~	~~2.442~~	~~n/a~~	~~n/a~~	~~0.576~~	~~n/a~~

Table 5.1D-5R
Calculation of Inversion Fumigation Impacts
Hidden Hills Solar Electric Generating System
Revised April 2012

Boiler Emission Rates, g/s

Unit	NOx	SO2	CO	PM10	# of Units
Auxiliary Boilers	0.345	6.591E-02	0.574	4.494E-02	2
Nighttime Preservation Boilers	2.142E-02	3.971E-03	6.911E-02	6.399E-03	2

Flat Terrain Modeling Results from SCREEN3

Unit	**Unit Impact, ug/m3 per g/s**	**Distance to Maximum (m)**
Auxiliary Boilers	5.84	779
Nighttime Preservation Boilers	107	176

Inversion Breakup Modeling Results from SCREEN3

	Unit Impact, ug/m3 per g/s	**Distance to Maximum (m)**
Auxiliary Boilers	4.95	5785
Nighttime Preservation Boilers	0	n/a

Adjust 1-hour impacts for longer averaging periods to account for 90-minute duration of fumigation

	1-hr unit	**3-hr unit**	**8-hr unit**	**24-hr unit**
Auxiliary Boilers	5.84	5.26	4.09	2.34
Nighttime Preservation Boilers	107.00	96.30	74.90	42.80

Calculation of Fumigation Impacts

Case/Avg Period	**NOx**	**SO2**	**CO**	**PM10**
One-Hour				
Auxiliary Boilers	4.03	0.77	6.70	-
Nighttime Preservation Boilers[a]	4.58	0.85	14.79	-
Total	8.6	1.6	21.5	-
3 Hours				
Auxiliary Boilers	-	0.69	-	-
Nighttime Preservation Boilers[a]	-	0.76	-	-
Total	-	1.5	-	-
8 Hours				
Auxiliary Boilers	-	-	4.69	-
Nighttime Preservation Boilers[a]	-	-	10.35	-
Total	-	-	15.0	-
24 Hours				
Auxiliary Boilers	-	0.31	-	0.21
Nighttime Preservation Boilers[a]	-	0.34	-	0.55
Total	-	0.6	-	0.8

a Although inversion breakup fumigation impacts from the nighttime preservation boilers is zero, flat terrain impacts were included to ensure that the evaluation is conservative.

Table 5.1D-6

Hidden Hills Solar Electric Generating System

Emission Rates for Modeling Mirror Washing Activities

Revised April 2012[1]

	Em Rates, g/s				
	NOx	**SO2**	**CO**	**PM10**	**PM2.5**
Averaging Period: One hour					
MWMs-- combustion	2.56E-02	6.99E-03	9.92E-03	--	--
Averaging Period: Three hours					
MWMs-- combustion	--	6.99E-03	--	--	--
Averaging Period: Eight hours					
MWMs-- combustion	--	--	9.92E-03	--	--
Averaging Period: 24 hours					
MWMs-- combustion	--	5.82E-03	--	6.63E-04	6.63E-04
MWMs-- fugitive dust	--	--	--	1.82E-01	1.82E-02
Averaging Period: Annual					
MWMs-- combustion	2.13E-02	5.82E-03	--	6.63E-04	6.63E-04
MWMs-- fugitive dust	--	--	--	1.82E-01	1.82E-02

Note:

1. Revised version of information previously provided as Table DR146-2 in response to Staff's Data Request 146 (Set 2B) , submitted February 20, 2012.

Appendix 5.1E

Revised April 2012

Screening Health Risk Assessment

APPENDIX 5.1E

Screening Health Risk Assessment

The screening level health risk assessment has been prepared using CARB's Hotspots Analysis and Reporting Program (HARP) computer program (Version 1.4d, January 2011) and associated guidance in the OEHHA's *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* (August 2003). The HARP model was used to assess cancer risk as well as chronic and acute risk impacts. The most recent health database[1] provided by CARB, reflecting the RELs adopted by OEHHA in December 2008, has been used. Although the December 2008 RELs include 8-hour RELs for acetaldehyde, acrolein and formaldehyde, these 8-hour RELs have not yet been incorporated into the HARP software, so they have been calculated by hand for inclusion in the risk assessment.

Modeling Inputs

HAP emission rates used in the screening health risk assessment are shown in Tables 5.1E-2R and E-3R (emission rates in pounds per hour and pounds per year); Table 5.1E-4R (equivalent emission rates in g/s per μ/m³ for the 8-hour acute exposures); and Table 5.1E-5R (stack parameters used for modeling). Maximum hourly heat input rates for each unit were used in calculating emissions for acute impacts; annual average heat input rates were used in calculating emission rates for the chronic and cancer risk analyses. Stack parameters were the same as those used in the criteria pollutant impact assessment. Because evaporative drift emissions from the WSACs are so low and because potential impacts will be minimized through the use of high efficiency drift eliminators and deionized water with ~~very~~ relatively low TDS levels, these units were not included in the HRA.

Risk Analysis Method

AERMOD/HARP

The dispersion analysis was performed using AERMOD in accordance with the procedures outlined in the modeling protocol (Appendix 5.1H), using the modeling inputs described above. AERMOD produces output files containing modeled concentrations of each compound shown in Table 5.1-28 at every receptor. However, because the HARP model was designed to use modeling output files from the ISCST3 model, rather than the current recommended guideline AERMOD model, the AERMOD results must be reformatted before they can be used in HARP.

The HARP On-Ramp is a tool provided by CARB that reformats output files from models other than ISCST3 so that they can be read by the HARP Risk Module. Version 1 of the On-Ramp tool was used to create files required by HARP to complete the screening health risk assessment.

---

[1] February 2009, available at http://www.arb.ca.gov/toxics/harp/data.htm.

AERMOD for 8-Hour Acute HHI

Because HARP does not yet have the capability of evaluating an acute HHI for an 8-hour period, an alternative analysis method was used. In this method, a weighted acute risk factor is used in place of a g/s emission rate for each unit, and AERMOD is used to evaluate the maximum 8-hour acute HHI from all sources. To calculate the weighted risk for each source, the maximum hourly emission rate in g/s for each pollutant (acetaldehyde, acrolein and formaldehyde) was divided by the individual 8-hour reference exposure level for that pollutant in $\mu g/m^3$. The result was a weighted contribution to the acute 8-hour HHI, in units of g/s per $\mu g/m^3$, for each pollutant. These weighted contributions were then summed for each source. The calculations are shown in Table 5.1E-4R.

Summary of Results

The results of the screening level health risk assessment are summarized in Table 5.1E-1R.

TABLE 5.1E-1R
Screening Level Risk Assessment Results, including the Mirror Washing Machines

Risk Methodology	HH SEGS Project Impacts
Modeled Residential Cancer Risk (in one million)	
Residential: Derived (OEHHA) Method at PMI	~~0.39~~2.8
Residential: Derived (OEHHA) Method at maximally impacted residential receptor	~~0.15~~0.5
Modeled Worker Cancer Risk (in one million)	
Worker Exposure: Derived (OEHHA) Method at PMI	~~0.06~~0.4
Modeled Acute and Chronic Impacts	
Acute HHI—1-hour RELs	~~0.004~~0.003
Acute HHI—8-hour RELs	~~0.004~~0.002
Chronic HHI	~~0.0002~~0.001

As shown in Table 5.1E-1, the cancer risk from the project is well below the significance level of 10 in one million. In addition, the acute and chronic health hazard indices are well below the significance level of one. The analysis of potential cancer risk described in this section employs extremely conservative methods and assumptions, as follows:

- The analysis includes representative weather data over five years to ensure that the least favorable conditions producing the highest ground-level concentration of power plant emissions are included. The analysis then assumes that these worst-case weather conditions, which in reality occurred only once in five years, will occur every year for 70 years.

- 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.
- The analysis assumes that a sensitive individual is at the location of the highest ground-level concentration of power plant emissions continuously over the entire 70-year period. In reality, people rarely live in their homes for 70 years, and even if they do, they leave their homes to attend school, go to work, go shopping, and so on.

The purpose of using these unrealistic assumptions is to consciously overstate the potential impacts. No one will experience exposures as great as those assumed for this analysis. By determining that even this highly overstated exposure will not be significant, there is a high degree of confidence that the much lower exposures that actual persons will experience will not result in a significant increase in cancer risk. In short, the analysis ensures that there will not be significant public health impacts at any location, under any weather condition, or under any operating condition. A more detailed discussion of potential project impacts on public health is provided in Section 5.9, Public Health.

The locations of the maximum acute, chronic, and cancer risks are shown in Figure 5.1E-1R.

FIGURE 5.1E-1
Locations of Maximum Acute, Chronic, and Cancer Risks from Project Operation

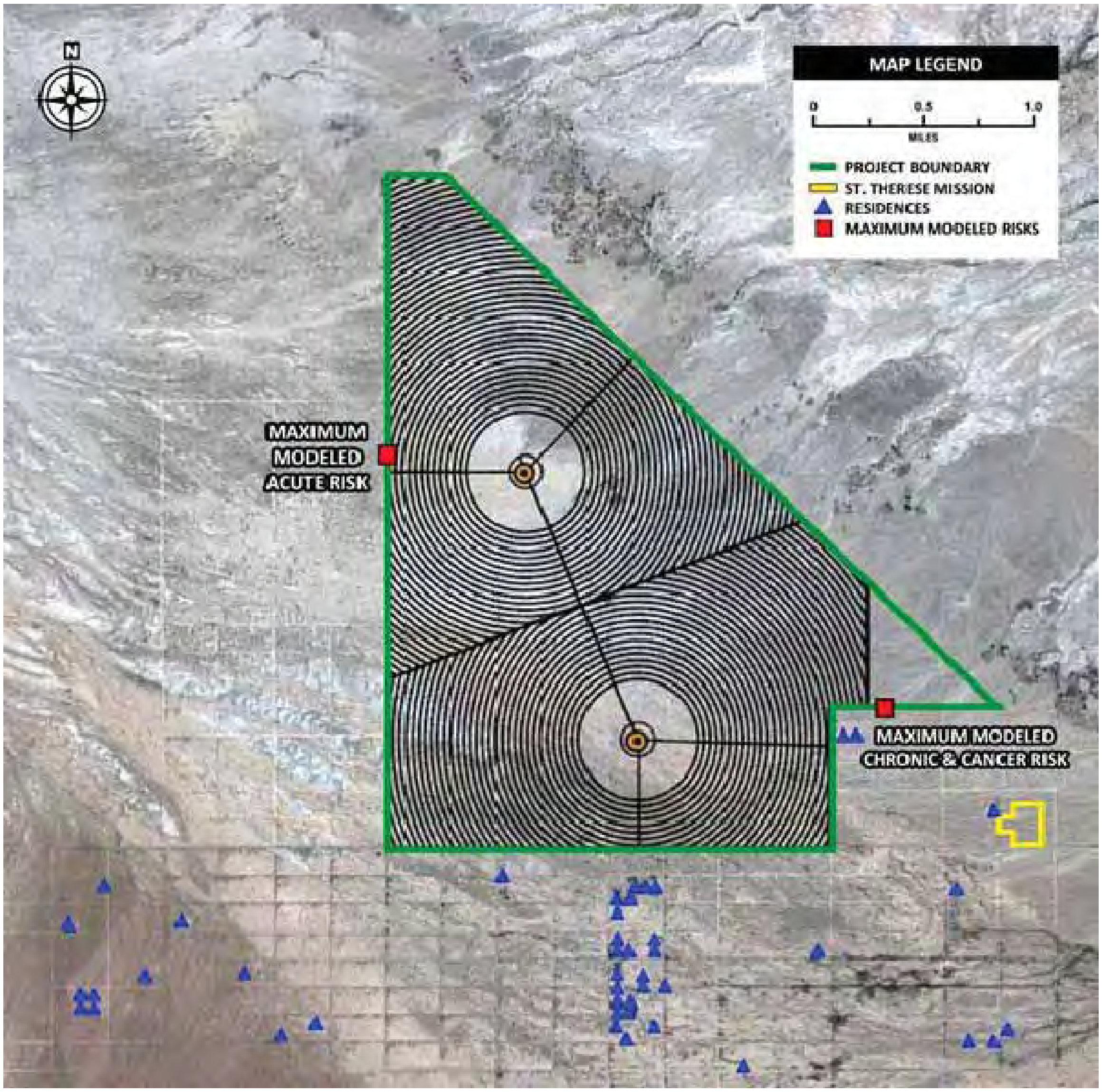


Table 5.1E-2R
Risk Assessment Modeling Inputs for Boilers
Hidden Hills Solar Electric Generating System

Revised April 2012

	Auxiliary Boilers (each)		Emission Rates			
	Emission Rates		Auxiliary Boilers (each)		Nighttime Boilers (each)	
Compound	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
Acetaldehyde	0.0	0.0	2.197E-04	2.655E-01	4.559E-05	2.199E-01
Acrolein	0.0	0.0	1.953E-04	2.360E-01	3.971E-05	1.915E-01
Benzene	0.0	0.0	4.150E-04	5.014E-01	8.530E-05	4.114E-01
Ethylbenzene	0.0	0.0	4.882E-04	5.899E-01	1.015E-04	4.894E-01
Formaldehyde	0.0	0.0	8.788E-04	1.062E+00	1.809E-04	8.725E-01
Hexane	0.0	0.0	3.174E-04	3.834E-01	6.765E-05	3.263E-01
Naphthalene	0.0	0.0	7.324E-05	8.849E-02	4.412E-06	2.128E-02
PAHs						
Benzo(a)anthracene	0.0	0.0	3.855E-06	4.657E-03	2.322E-07	1.120E-03
Benzo(a)pyrene	0.0	0.0	2.570E-06	3.105E-03	1.548E-07	7.466E-04
Benzo(b)fluoranthrene	0.0	0.0	3.855E-06	4.657E-03	2.322E-07	1.120E-03
Benzo(k)fluoranthrene	0.0	0.0	3.855E-06	4.657E-03	2.322E-07	1.120E-03
Chrysene	0.0	0.0	3.855E-06	4.657E-03	2.322E-07	1.120E-03
Dibenz(a,h)anthracene	0.0	0.0	2.570E-06	3.105E-03	1.548E-07	7.466E-04
Indeno(1,2,3-cd)pyrene	0.0	0.0	3.855E-06	4.657E-03	2.322E-07	1.120E-03
Propylene	0.0	0.0	3.791E-03	4.58	7.794E-03	37.59
Toluene	0.0	0.0	1.904E-03	2.30	3.897E-04	1.88
Xylene	0.0	0.0	1.416E-03	1.71	2.897E-04	1.40

Table 5.1E-3R
Risk Assessment Modeling Inputs for Emergency Engines
Hidden Hills Solar Electric Generating System

Revised April 2012

Unit	DPM Emission Rate lb/hr	 lb/yr
Power Block Emergency Generators (each)	0.6007	60.069
Common Area Emergency Generator	6.581E-02	6.581
Power Block Fire Pump Engines (each)	3.307E-02	3.307
Common Area Fire Pump Engine	3.307E-02	3.307

Table 5.1E-4R
Calculation of Screening HRA Inputs for 8-Hour Exposure Periods
Hidden Hills Solar Electric Generating System

Revised April 2012

		Auxiliary Boilers (each)		Nighttime Preservation Boilers (each)	
Chemical	8-hour REL (ug/m3)	One-hour Emission Rate, g/s	Weighted Contribution to Acute HHI (g/s per ug/m3)	One-hour Emission Rate, g/s	Weighted Contribution to Acute HHI (g/s per ug/m3)
Acetaldehyde	300	2.77E-05	9.23E-08	5.74E-06	1.91E-08
Acrolein	0.7	2.46E-05	3.52E-05	5.00E-06	7.15E-06
Formaldehyde	9	1.11E-04	1.23E-05	2.28E-05	2.53E-06
	Acute Risk Factor		4.75E-05		9.70E-06

Table 5.1E-5R
Stack Parameters for Screening HRA
Hidden Hills Solar Electric Generating System

Revised April 2012

Stack Parameters				
	Stack Diam (m)	Stack Ht (m)	Exhaust Temp (deg K)	Exhaust Velocity (m/s)
Auxiliary Boilers	1.676	41.148	421.889	15.486
Nighttime Preservation Boilers	0.457	9.144	421.889	12.543
Power Block Emergency Generators (each)	0.457	5.486	769.111	56.344
Power Block Fire Pump Engines (each)	0.102	4.572	796.889	96.051
Common Area Emergency Generator	0.203	5.486	730.222	32.745
Common Area Fire Pump Engine	0.102	4.572	796.889	96.051

Appendix 5.1F

Revised April 2012

Construction Emissions and Impact Analysis

Data Response 8 from

Hidden Hills Solar Electric Generating System (HHSEGS)

(11-AFC-2)

Data Response, Set 1A
(Response to Data Requests 1 though 50)

Submitted to the

California Energy Commission

Submitted by

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

November 2011

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

Data Request

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

Response: The requested spreadsheet file contains trade secret information that is confidential and proprietary to Sierra Research, Inc. As such, this file, along with an application for confidential designation, has been submitted separately from this set of data responses pursuant to Section 2501 *et Seq.* of the Commission's Regulations.

Data Request

8. The construction emissions and impacts should be evaluated for the actual Tiered engines to be used during construction. Please identify the Tier level (Tier 3, 2, 1 or 0) of all of the off-road equipment and associated emission factors. If Tier 3 engines are the only Tier levels assumed for the engines listed, please provide a survey of at least three construction equipment vendors that would be able to provide the Tier level that was assumed to determine the emission factors in the AFC. Other projects have not been able to obtain Tier 3 powered vehicles for specialty vehicles such as cranes and other types of equipment.

Response: The construction impacts presented in the AFC assumed that all construction vehicles were equipped with Tier 3 or better engines, based on the effective dates of the respective nonroad engine standards. This approach was taken to match the construction equipment mitigation requirements developed by the CEC over the past few years for power plant projects. Specific Tier assumptions were shown in the construction emissions calculations attachment to the AFC (Appendix 5.1F, Attachment 5.1F-1); the specific table showing the requested information is included here as Table DR8-2-1 of Attachment DR8-2 for convenience.

At the October 25, 2011, data request workshop, Applicant raised a concern that the requested survey of construction equipment vendors would not provide useful information regarding the future availability of Tier 3 equipment because that availability is highly dependent upon the demand for Tier 3 - especially by other construction projects – at the exact time when the equipment would be needed for HHSEGS. Applicant agreed to develop a proposal for evaluating the impacts of a more likely construction vehicle fleet composition to account for the possibility that some of the vehicles may not be available with Tier 3 or 4 engines.

Based on information provided in the August 2011 Monthly Compliance Report for the Ivanpah SEGS project, we have determined that through the end of August 2011, about 18 percent of the construction equipment and 14 percent of the total engine horsepower used for that project is Tier 2-certified; 69 percent of the equipment and 75 percent of the horsepower is Tier 3-certified; and the rest is Tier 4 interim or Tier 4-certified. (Applicant did not account for Tier 0 and Tier 1 vehicles as there were only a few of those and the vehicles did not appear to be onsite for any significant period of time. Based on this assessment, and after consultation with CEC staff, Applicant has prepared a supplemental construction emissions impact analysis that assumes that 20 percent of the construction equipment horsepower comes from Tier 2 vehicles. For this analysis, Applicant first calculated emissions assuming that 100 percent of the construction vehicles will be equipped with Tier 2 engines. Applicant then increased the daily and annual emission rates used for the original project construction impact modeling by 20 percent of the difference between the Tier 3/4 calculated emissions and the Tier 2 calculated emissions. These calculations are shown in Attachment DR8-1. These calculations show that while daily and annual NOx and CO emissions could be expected to increase if a significant fraction of Tier 2 vehicles are used during construction, emissions of other pollutants would remain essentially unchanged.

The results of the supplemental analysis are summarized in Table DR8-1. Predicted impacts that are different under the 20/80 supplemental scenario from those provided in the AFC are shown underlined. Predicted impacts from the Tier 3/4 scenario, as presented in Table 5.1-35 of the AFC, are shown in strike-out font for comparison.

TABLE DR8-1
Modeled Maximum Impacts From Onsite Construction Activities, Assuming 20% Of Offroad Vehicles are Tier 2-Certified

Pollutant	Averaging Period	Maximum Predicted Impact (µg/m^3)	Maximum Background Concentration (µg/m^3)	Total Concentration[a] (µg/m^3)	NAAQS (µg/m^3)	CAAQS (µg/m^3)
NO$_2$	1-hr (highest)	~~100.1~~ 133.5	117	~~217~~ 251	--	339
	1-hr (98th percent)	~~85.8~~ 88.0	80.8	~~167~~ 169	188	--
	Annual	~~3.4~~ 3.7	7.5	11	100	57
SO$_2$	1-hr	0.2	93.6	94	196	655
	3-hr	0.2	23.4	24	1300	--
	24-hr	0.05	13.1	13	--	105
	Annual	0.01	2.7	2.7	80	--
CO	1-hr	~~62.9~~ 66.8	1,750	~~1,813~~ 1,817	40,000	23,000
	8-hr	~~26.7~~ 28.3	1,333	~~1,360~~ 1,361	10,000	10.000
PM$_{10}$	24-hr	~~24.2~~ 29.3	96	~~120~~ 125	150	50
	Annual	1.4	14	15	--	20
PM$_{2.5}$	24-hr[b]	5.1	11.4	17	35	--
	Annual[c]	0.3	4.9	5.2	15.0	12

Notes:

[a] Total concentrations shown in this table are the sum of the maximum predicted impact and the maximum measured background concentration. Because the maximum impact will not occur at the same time as the maximum background concentration, the actual maximum combined impact will be lower.

[b] Background concentration shown is the three-year average of the 98th percentile values, in accordance with the form of the federal standard. Table 5.1F-8, footnote c.

[c] Background value shown is the three-year average of the annual arithmetic mean, in accordance with the form of the standard.

While the maximum modeled NO$_2$ and CO impacts with 20% Tier 2-certified construction equipment are predicted to be slightly higher than the impacts evaluated in the AFC, the higher impacts would not change any of the conclusions presented in the AFC; namely, that construction impacts alone for all modeled pollutants are expected to be below the most stringent state and national standards. With the exception of the 24-hour average PM$_{10}$ standard, construction activities are not expected to cause an exceedance of state or federal ambient air quality standards. However, the background state 24-hour PM$_{10}$ standard is exceeded in the absence of the construction emissions for the project.

Attachment DR8-1

Supplemental Construction Emissions Impact Analysis

Table DR8-1 below summarizes the calculated emissions from construction equipment as presented in the AFC in Tables 5.1F-1 and 5.1F-2 (pounds per day and tons per year, respectively). Table DR8-2 below summarizes the calculated emissions from construction equipment assuming all offroad equipment is Tier 2-certified; emission factors for each piece of equipment are shown in the attached table. Table DR8-3 below summarizes the daily and annual emissions used for the supplemental construction impacts analysis, assuming that 20% of the offroad construction equipment is Tier 2-certified while the remainder is Tier 3- or 4-certified.[1] Fugitive dust and concrete batch plant emission rates are unchanged from the values used in the original analysis. [2]

Table DR8-1
Construction Equipment Emissions, Tier 3/4 Nonroad Vehicles

	NOx	CO	VOC	SOx	PM2.5	PM10
Daily Emissions During Peak Month (lbs/day)						
Construction Equipment	349.8	181.3	25.9	0.65	15.2	15.2
Annual Construction Emissions During Peak 12-Month Period (tons/year)						
Construction Equipment	31.24	16.55	2.31	0.06	1.28	1.28

Table DR8-2
Construction Equipment Emissions, Tier 2 Nonroad Vehicles

	NOx	CO	VOC	SOx	PM2.5	PM10
Daily Construction Emissions During Peak Month (lbs/day)						
Construction Equipment	522.4	236.4	43.2	0.66	14.5	14.5
Annual Construction Emissions During Peak 12-Month Period (tons/year)						
Construction Equipment	46.23	21.28	3.88	0.06	1.32	1.32

Table DR8-3
Construction Equipment Emissions, 20% Tier 2 and 80% Tier 3/4 Nonroad Vehicles

	NOx	CO	VOC	SOx	PM2.5	PM10
Daily Construction Emissions During Peak Month (lbs/day)						
Construction Equipment	384.4	192.3	29.3	0.65	15.1	15.1
Annual Construction Emissions During Peak 12-Month Period (tons/year)						
Construction Equipment	34.2	17.5	2.62	0.06	1.29	1.29

---

[1] Specific emission control tier assumptions used for the analysis presented in the AFC are shown in the attached table reproduced from Appendix 5.1F to the original AFC.

[2] An error was discovered in the conversion of PM_{10} emission rate for the batch plant from the pounds per hour emission rate shown in Table 5.1F-1 of the AFC (which is correct) to the gram per second value used for modeling batch plant emissions in the original construction impacts analysis. The conversion error has been corrected in the supplemental analysis results presented here.

Since daily and annual SOx emissions under the 20/80 supplemental scenario are lower than or unchanged from the original construction equipment emissions assumptions, only NOx, CO and $PM_{10}/PM_{2.5}$ emissions were included in the supplemental analysis.[3],

The results of the supplemental analysis are summarized in Table DR8-4. Predicted impacts that are different under the 20/80 supplemental scenario from those provided in the AFC are shown underlined. Predicted impacts from the Tier 3/4 scenario, as presented in Table 5.1-35 of the AFC, are shown in strike-out font for comparison.

TABLE DR8-4

Modeled Maximum Impacts from Onsite Construction Activities, Assuming 20% of Offroad Vehicles are Tier 2-Certified

Pollutant	Averaging Period	Maximum Predicted Impact ($\mu g/m^3$)	Maximum Background Concentration ($\mu g/m^3$)	Total Concentration[a] ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	CAAQS ($\mu g/m^3$)
NO_2	1-hr (highest)	~~100.1~~ 133.5	117	~~217~~ 251	--	339
	1-hr (98th percntl)	~~85.8~~ 88.0	80.8	~~167~~ 169	188	--
	Annual	~~3.4~~ 3.7	7.5	11	100	57
SO_2	1-hr	0.2	93.6	94	196	655
	3-hr	0.2	23.4	24	1300	--
	24-hr	0.05	13.1	13	--	105
	Annual	0.01	2.7	2.7	80	--
CO	1-hr	~~62.9~~ 66.8	1,750	~~1,813~~ 1,817	40,000	23,000
	8-hr	~~26.7~~ 28.3	1,333	~~1,360~~ 1,361	10,000	10.000
PM_{10}	24-hr	~~24.2~~ 29.3	96	~~120~~ 125	150	50
	Annual	1.4	14	15	--	20
$PM_{2.5}$	24-hr[b]	5.1	11.4	17	35	--
	Annual[c]	0.3	4.9	5.2	15.0	12

Notes:

[a] Total concentrations shown in this table are the sum of the maximum predicted impact and the maximum measured background concentration. Because the maximum impact will not occur at the same time as the maximum background concentration, the actual maximum combined impact will be lower.

[b] Background concentration shown is the three-year average of the 98th percentile values, in accordance with the form of the federal standard. Table 5.1F-8, footnote c.

[c] Background value shown is the three-year average of the annual arithmetic mean, in accordance with the form of the standard.

While the maximum modeled NO_2 and CO impacts with 20% Tier 2-certified construction equipment are predicted to be slightly higher than the impacts evaluated in the AFC, the higher impacts would not change any of the conclusions presented in the AFC; namely, that construction impacts alone for all modeled pollutants are expected to be below the most stringent state and national standards. With the exception of the 24-hour average PM_{10} standard, construction activities are not expected to cause an exceedance of state or federal ambient air quality standards. However, the background

---

[3] Daily PM emissions decrease when switching from Tier 3/4 to Tier 2 because of the differences in the zero-hour emission factors (see attached page from U.S.EPA's NONROAD model documentation, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling--Compression-Ignition," NR-009D, EPA-420-R-10-018, dated July 2010, available at http://www.epa.gov/otaq/models/nonrdmdl/nonrdmdl2010/420r10018.pdf).

state 24-hour PM_{10} standard is exceeded in the absence of the construction emissions for the project.

Attachment DR8-2
Emission Factors excerpted from AFC Appendix 5.1F

Tier 3/4 Emission Factors (from Appendix 5.1F of the AFC)

Hidden Hills Construction Equipment Emission Factors

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

		Tier (Nonroad) Avg mph (Onroad)	**Base Emission Factors g/bhp (1)**						**Transient Adjustment Factor (2)**							**Adjustment (3)**	**Adjusted Emission Factors (g/bhp - Nonroad, lb/vmt Onroad)**					
Equipment	HP		BSFC lb/hp-hr	NOx	CO	VOC	SOx	PM10	Adj. Type	BSFC	NOx	CO	VOC	SOx	PM10	PM10 Fuel S	BSFC	NOx	CO	VOC	SOx	PM10
Solar Field Assembly and Installatior																						
ISO Carrier	290	3	0.367	2.500	0.748	0.184	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.748	0.184	0.005	0.064
Forklift, 10,000 lb (Propane)	90	3	0.408	3.000	2.366	0.184	0.006	0.200	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
Air Compressor, 300 cfm	140	3	0.367	2.500	0.867	0.184	0.005	0.220	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.867	0.184	0.005	0.134
Grader	175	3	0.367	2.500	0.867	0.184	0.005	0.220	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.326	0.193	0.005	0.237
Tractor	75	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Pylon Insertion Rigs	670	3	0.367	2.500	1.327	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	1.327	0.167	0.005	0.064
Solar Field Roads Clearing, Grubbing, and Grading																						
Grader	215	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Site Road Work																						
Grader	215	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Scraper	330	3	0.367	2.500	0.843	0.167	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.289	0.175	0.005	0.134
Paver	220	3	0.367	2.500	0.748	0.184	0.005	0.150	HI LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Concrete Batch Plant																						
Loader	270	3	0.367	2.500	0.843	0.167	0.005	0.150	Lo LF	1.18	1.21	2.57	2.29	1.18	2.37	-0.1013	0.433	3.025	2.165	0.382	0.006	0.254
Transmix Trucks	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Tower and Boiler Erection																						
Strand Jack System	670	3	0.367	2.500	1.327	0.167	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	2.031	0.175	0.005	0.134
Crawler Crane	330	3	0.367	2.500	0.843	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.843	0.167	0.005	0.064
Rough Terrain Picker, 120 ton	300	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Rough Terrain Picker, 50 ton	190	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Forklift, 10,000 lb	90	3	0.408	3.000	2.366	0.184	0.006	0.200	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
Compressor, 300 cfm	140	3	0.367	2.500	0.867	0.184	0.005	0.220	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.867	0.184	0.005	0.134
Man Lift	75	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Truck, Semi	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
ACC Erection																						
Crawler Crane	670	3	0.367	2.500	1.327	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	1.327	0.167	0.005	0.064
Forklft, 50,000 lb	230	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Forklift, 10,000 lb	90	3	0.408	3.000	2.366	0.184	0.006	0.200	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
Man Lift, 40 ft	50	4	0.408	4.728	1.532	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.105
Man Lift, 85 ft	75	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Man Lift, 60 ft	50	4	0.408	4.728	1.532	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.105
Truck, Semi	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Rough Terrain Picker	190	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Compressor, 300 cfm	140	3	0.367	2.500	0.867	0.184	0.005	0.220	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.867	0.184	0.005	0.134
Power Block Erection																						
Crawler Crane	670	3	0.367	2.500	1.327	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	1.327	0.167	0.005	0.064
Rough Terrain Crane, 65 Ton	250	3	0.367	2.500	0.748	0.184	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.748	0.184	0.005	0.064
Rough Terrain Crane, 35 Ton	160	3	0.367	2.500	0.867	0.184	0.005	0.220	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.867	0.184	0.005	0.134
Welder, 250 amp	20	4	0.408	4.440	2.161	0.438	0.006	0.280	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.440	2.161	0.438	0.006	0.185
Compressor, 125 cfm	60	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Man Lift, 60 ft	50	4	0.408	4.728	1.532	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.105
Man Lift, 85 ft	75	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Man Lift, 40 ft	50	4	0.408	4.728	1.532	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.105
Forklift, 10,000 lb	90	3	0.408	3.000	2.366	0.184	0.006	0.200	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
Rough Terrain Crane, 65 Ton	250	3	0.367	2.500	0.748	0.184	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.748	0.184	0.005	0.064
Miscellaneous																						
Water Truck, 5,000 gal	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Pickup Trucks (Gasoline)	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.67E-03	2.33E-02	2.45E-03	0.00E+00	8.53E-05
AWD Gators (Gasoline)	25	4	0.408	4.440	2.161	0.438	0.006	0.280	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.440	2.161	0.438	0.006	0.185

Tier 2 Emission Factors

Hidden Hills Construction Equipment Emission Factors

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

		Tier (Nonroad) Avg mph (Onroad)	**Base Emission Factors g/bhp (1)**	**Transient Adjustment Factor (2)**							**Adjustment (3)**	**Adjusted Emission Factors (g/bhp - Nonroad, lb/vmt Onroad)**					
Equipment	HP		BSFC lb/hp-hr	Adj. Type	BSFC	NOx	CO	VOC	SOx	PM10	PM10 Fuel S	BSFC	NOx	CO	VOC	SOx	PM10
Solar Field Assembly and Installation																	
ISO Carrier	290	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.000	0.748	0.309	0.005	0.046
Forklift, 10,000 lb (Propane)	90	2	0.408	Hi LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0964	0.412	4.465	3.619	0.386	0.006	0.199
Air Compressor, 300 cfm	140	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.100	0.867	0.338	0.005	0.094
Grader	175	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	3.895	1.326	0.355	0.005	0.135
Tractor	75	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1126	0.481	5.170	6.079	0.841	0.007	0.360
Pylon Insertion Rigs	670	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.100	1.327	0.167	0.005	0.046
Solar Field Roads Clearing, Grubbing, and Grading																	
Grader	215	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075
Site Road Work																	
Grader	215	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075
Scraper	330	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	4.118	1.289	0.175	0.005	0.075
Paver	220	2	0.367	HI LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075
Concrete Batch Plant																	
Loader	270	2	0.367	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1013	0.433	4.400	1.921	0.706	0.006	0.158
Transmix Trucks	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Tower and Boiler Erection																	
Strand Jack System	670	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	3.895	2.031	0.175	0.005	0.075
Crawler Crane	330	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.335	0.843	0.167	0.005	0.046
Rough Terrain Picker, 120 ton	300	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075
Rough Terrain Picker, 50 ton	190	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075
Forklift, 10,000 lb	90	2	0.408	Hi LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0964	0.412	4.465	3.619	0.386	0.006	0.199
Compressor, 300 cfm	140	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.100	0.748	0.309	0.005	0.046
Man Lift	75	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1126	0.481	5.170	6.079	0.841	0.007	0.360
Truck, Semi	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
ACC Erection																	
Crawler Crane	670	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.100	1.327	0.167	0.005	0.046
Forklift, 50,000 lb	230	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075
Forklift, 10,000 lb	90	2	0.408	Hi LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0964	0.412	4.465	3.619	0.386	0.006	0.199
Man Lift, 40 ft	50	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1126	0.481	5.201	3.938	0.639	0.007	0.555
Man Lift, 85 ft	75	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1126	0.481	5.170	6.079	0.841	0.007	0.360
Man Lift, 60 ft	50	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1126	0.481	5.201	3.938	0.639	0.007	0.555
Truck, Semi	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Rough Terrain Picker	190	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075
Compressor, 300 cfm	140	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.100	0.748	0.309	0.005	0.046
Power Block Erection																	
Crawler Crane	670	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.100	1.327	0.167	0.005	0.046
Rough Terrain Crane, 65 Ton	250	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.000	0.748	0.309	0.005	0.046
Rough Terrain Crane, 35 Ton	160	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.100	0.748	0.309	0.005	0.046
Welder, 250 amp	20	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.00	1.97	-0.1126	0.481	4.884	5.554	1.003	0.006	0.412
Compressor, 125 cfm	60	2	0.408	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.700	2.366	0.367	0.006	0.145
Man Lift, 60 ft	50	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1126	0.481	5.201	3.938	0.639	0.007	0.555
Man Lift, 85 ft	75	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1126	0.481	5.170	6.079	0.841	0.007	0.360
Man Lift, 40 ft	50	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1126	0.481	5.201	3.938	0.639	0.007	0.555
Forklift, 10,000 lb	90	2	0.408	Hi LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0964	0.412	4.465	3.619	0.386	0.006	0.199
Rough Terrain Crane, 65 Ton	250	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.000	0.748	0.309	0.005	0.046
Miscellaneous																	
Water Truck, 5,000 gal	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Pickup Trucks (Gasoline)	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.67E-03	2.33E-02	2.45E-03	0.00E+00	8.53E-05
AWD Gators (Gasoline)	25	2	0.408	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.440	2.161	0.438	0.006	0.171

Notes: Combustion Emissions

(1) - Steady State Emission Factors from Table A4 of EPA July 2010 NR-009d Publication.

(2) - In use adjustment factors per Table A5 EPA July 2010 NR-009d Publication.

(3) - PM10 and SO2 adjustments due to Equation 5 on page 22 of EPA July 2010 Report No. NR-009d.

Table 7. Summary of the Basis for the PM_{10} Zero-Hour Steady-State CI Emission Factors in NONROAD2008a

HP	PM_{10} g/hp-hr									
	Tier 0[a]	T0 Basis	Tier 1	T1 Basis	Tier 2	T2 Basis[b]	Tier 3	T3 Basis[b]	Tier 4[e]	T4 Basis
>0 to 11	1	OFFROAD	0.4474	cert	0.50	(1) The NOx T1 EF exceeds the T2 std. To meet NOx T2, changes are likely to increase PM. The T2 PM EF is therefore expected to be greater than 0.44 (T1 EF) and less than 0.60 (T2 std); 0.50 chosen as a reasonable value.	na		0.28	8% margin from 0.3 std
>11 to 16	0.9	OFFROAD	0.2665	cert	0.2665	(3) Same as T1 (since T1 EF still below T2 std)	na		0.28	8% margin from 0.3 std
>16 to 25	0.9	OFFROAD	0.2665	cert	0.2665	(3) Same as T1 (since T1 EF still below T2 std)	na		0.28	8% margin from 0.3 std
>25 to 50	0.8	OFFROAD	0.3389	cert	0.3389	(3) Same as T1 (since T1 EF still below T2 std)	na		0.0184[c]	8% margin from 0.02 std
>50 to 75	0.722	EF data	0.4730		0.24	(4) 20% highway-based margin from std (since T1 EF exceeds T2 std, cannot be used)	0.30	(1) T3 std	0.0184[c]	8% margin from 0.02 std
>75 to 100	0.722	EF data	0.4730		0.24	(4) 20% highway-based margin from std (since T1 EF exceeds T2 std, cannot be used)	0.30	(1) T3 std	0.0092	8% margin from 0.01 std
>100 to 175	0.402	EF data	0.2799		0.18	(4) 20% highway-based margin from std (since T1 EF exceeds T2 std, cannot be used)	0.22	(1) T3 std	0.0092	8% margin from 0.01 std
>175 to 300	0.402	EF data	0.2521	cert	0.1316	(2) T2 EF for >300 to 600hp category applied to these hp categories. Rationale: All four hp categories meet same PM std. Also, T2 EF of 0.1316 based on actual certification data.	0.15	(1) T3 std	0.0092	8% margin from 0.01 std
>300 to 600	0.402	EF data	0.2008	cert	0.1316		0.15	(1) T3 std	0.0092	8% margin from 0.01 std
>600 to 750	0.402	EF data	0.2201	cert	0.1316		0.15	(1) T3 std	0.0092	8% margin from 0.01 std
>750 except gen sets	0.402	EF data	0.1934	cert	0.1316		na		0.0276[d]	8% margin from 0.03 std
Gen sets >750 to 1200	0.402	EF data	0.1934	cert	0.1316		na		0.0184[d]	8% margin from 0.02 std
Gen sets >1200	0.402	EF data	0.1934	cert	0.1316		na		0.0184[d]	8% margin from 0.02 std

[a] Tier 0 represents 1988+ MY engines for MYs prior to Tier 1. Separate EFs are also provided for Base (pre-1988 MY) engines. For ≤50hp engines, Base EF = Tier 0 EF. For >50hp engines, the Base EFs vary by application, so are not provided in this table.

[b] Numbers in brackets correspond to the option selected, which is briefly described here. For more details regarding the options, consult the text. The derivation of the highway-based compliance margins are discussed in Appendix E.

[c] For >25 to 75 hp engines, there is also a transitional Tier 4 PM standard of 0.22 g/hp-hr in 2008-2012. The corresponding PM EF in NONROAD is 0.20 g/hp-hr.

[d] For all engines >750 hp, there is also a transitional Tier 4 PM standard of 0.075 g/hp-hr in 2011-2014. The corresponding PM EF in NONROAD is 0.069 g/hp-hr.

[e] Tier 4 emission factors are considered to be transient, rather than steady-state.

APPENDIX 5.1F

Construction Emissions and Impact Analysis

Construction of the Project is expected to last approximately 29 months. Construction activities will include the following activities:

- Site road work;
- Solar field clearing, grubbing, and grading;
- Construction of switchyard, onsite electrical transmission lines, gas metering area and onsite gas supply pipelines;
- Power block erection;
- Tower and boiler erection;
- Solar field assembly and installation;
- ACC erection;
- Gas line construction (Clark County, Nevada);
- Transmission facilities (Clark and Nye Counties, Nevada); and
- Miscellaneous activities.

Construction Activities

The construction of the project will begin with site preparation activities, which include establishing internal site roadways; clearing, grubbing, and grading of all site areas; and installing drainage systems, underground utilities and conduits. After site preparation is finished, the construction and installation of the heliostats is expected to begin. Concurrent with installation of the solar fields, installation and assembly of the mechanical equipment, electrical equipment, and site buildings will take place. Concurrent with these activities, the linear facilities (natural gas line and transmission facilities) will be constructed in Clark and Nye Counties, Nevada.[1] Double-shift work schedules will be utilized during solar field assembly and installation activities, and a single-shift, 8-to 10-hour workday will be utilized for the remainder of the on-site construction activities.

Fugitive dust emissions from the construction of the project will result from the following:

- Dust entrained during site preparation and grading/excavation at the construction site;
- Dust entrained during onsite travel of construction vehicles on unpaved surfaces;
- Fugitive dust emitted from an onsite concrete batch plant; and
- Wind erosion of areas disturbed during construction activities.

Combustion emissions during construction will result from the following:

- Exhaust from the diesel construction equipment used for site preparation, grading, excavation, trenching, and construction of onsite and offsite (transmission and gas pipeline-related) structures;
- Exhaust from water trucks used to control construction dust emissions;
- Exhaust from portable welding machines, small generators, and compressors;

---

[1] Valley Electric Association (VEA) is a member-owned electric cooperative that serves portions of southern Nevada. VEA will own and operate the new HHSEGS transmission line as part of their transmission system. The gas pipeline will also be owned and operated by others.

- Exhaust from pickup trucks and diesel trucks used to transport workers and materials around the construction areas;
- Exhaust from diesel trucks used to deliver concrete, fuel, and construction supplies to the construction areas; and
- Exhaust from automobiles used by workers to commute to the construction areas.

To determine the potential worst-case daily construction impacts, exhaust and dust emission rates have been evaluated for each source of emissions. Maximum short-term impacts are calculated based on the equipment mix expected during the peak months of the construction schedule.[2] Annual emissions are based on the equipment mix operating during the peak 12-month construction period.

Linear Facilities

The linear facilities that will be constructed for the proposed project include a new natural gas pipeline and transmission lines. There are currently two distinct transmission options being considered because of a unique situation concerning Valley Electric Association (VEA). Under the first option, the project would interconnect via a 230 kV transmission line to a new VEA-owned substation (Tap Substation) at the intersection of Tecopa Road and Nevada State Route 160 (the Tecopa/SR-160 Option).The other option is a 500 kV transmission line that interconnects to the electric grid at the Eldorado substation (the Eldorado Option), in Boulder City, Nevada. The utility corridor for these project features will be located in Clark and Nye counties, Nevada, and will enter the project site at Common Area in the southeast corner of the site. These linear facilities will be constructed concurrently with the construction of the project.

Available Mitigation Measures

The following typical mitigation measures are proposed to control exhaust emissions from the diesel heavy equipment and potential emissions of fugitive dust during onsite construction of the project in California. These measures are consistent with those required under GBUAPCD Rule 401 (Fugitive Dust).[3] Mitigation measures for construction of the linear facilities located on BLM land in the State of Nevada will be subject to approval and enforcement by BLM. Mitigation measures for transmission line construction on privately-owned land in Clark County, NV, will be subject to approval and enforcement by the Clark County Department of Air Quality and Environmental Management.

- Unpaved roads and disturbed areas in the construction areas will be watered as frequently as necessary to prevent fugitive dust plumes. The frequency of watering can be reduced or eliminated during periods of precipitation.
- The vehicle speed limit will be 15 miles per hour within the construction areas.
- The construction area entrances shall be posted with visible speed limit signs.
- Construction equipment vehicle tires will be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.
- Gravel ramps of at least 20 feet in length will be provided at the tire washing/cleaning station.

---

[2] See calculations in Attachment 5.1F-1.

[3] See Section 5.1.2.3.

- Unpaved exits from the construction areas will be graveled or treated to prevent track-out to public roadways.
- Construction vehicles will enter the construction areas through the treated entrance roadways, unless an alternative route has been submitted to and approved by the Compliance Project Manager.
- Construction areas adjacent to any paved roadway will be provided with sandbags or other measures as specified in the Storm Water Pollution Prevention Plan (SWPPP) to prevent run-off to roadways.
- Paved roads within the construction areas will be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.
- At least the first 500 feet of any public roadway exiting from the construction areas shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff from the construction site is visible on public roadways.
- Soil storage piles and disturbed areas that remain inactive for longer than 10 days will be covered or treated with appropriate dust suppressant compounds.
- Vehicles used to transport solid bulk material on public roadways and having the potential to cause visible emissions will be provided with a cover, or the materials will be sufficiently wetted and loaded onto the trucks in a manner to provide at least one foot of freeboard.
- Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) will 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.

An on-site Air Quality Construction Mitigation Manager will be responsible for directing and documenting compliance with construction-related mitigation conditions for onsite construction.

Estimates of Emissions with Mitigation Measures—Onsite Construction

Tables 5.1F-1 and 5.1F-2 show the estimated maximum daily and annual heavy equipment exhaust and fugitive dust emissions with recommended mitigation measures for onsite construction activities. Detailed emission calculations are included as Attachment 5.1F-1.

TABLE 5.1F-1
Maximum Daily Emissions During Project Construction (Inyo Co., CA), Pounds Per Day, Month 8 (Combustion), Months 8 and 9 (Fugitive Dust)

	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$
Onsite						
Construction Equipment	349.8	181.2	25.9	0.5	15.2	15.2
Fugitive Dust	—	—	—	—	104.9	12.0
Concrete Batch Plant	—	—	—	—	70.8	10.6
Offsite						
Worker Travel, Truck Deliveries*	1,357.8	2,778.0	345.9	1.5	55.4	42.9
Total Emissions	**1,708**	**2,959**	**392**	**2.2**	**246**	**81**

*Offsite emissions.

TABLE 5.1F-2
Peak Annual Emissions During Project Construction (Inyo Co., CA), Tons Per Year

	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$
Onsite						
Construction Equipment	31.2	16.6	2.3	0.1	1.3	1.3
Fugitive Dust	—	—	—	—	8.8	1.0
Concrete Batch Plant	—	—	—	—	2.6	0.4
Offsite						
Worker Travel, Truck Deliveries*	30.9	302.3	32.3	0.01	1.5	1.0
Total Emissions	**62.2**	**319**	**34.5**	**0.1**	**14.1**	**3.7**

*Offsite emissions.

Estimates of Greenhouse Gas Emissions During Construction

GHG emissions during project construction have also been calculated. These calculations, which are provided in Attachment 5.1F-1, include global warming potentials and emission factors for CO_2, CH_4, and N_2O based on USEPA's Mandatory Reporting of Greenhouse Gases Rule. GHG emissions during construction are summarized in Table 5.1F-3.

TABLE 5.1F-3
Peak Annual GHG Emissions During Construction of the Linear Facilities, Metric Tons of CO_2e

Construction Project Element	CO_2 Equivalent (MT)
Onsite Construction	10,089

Analysis of Ambient Impacts from Onsite Construction

Ambient air quality impacts from emissions during construction of the project were estimated using an air quality dispersion modeling analysis. The modeling analysis considers the construction site location, the surrounding topography, and the sources of emissions during construction, including vehicle and equipment exhaust emissions and fugitive dust.

Existing Ambient Levels

As with the modeling analysis of project operating impacts (Section 5.1.4.5.7), ambient monitoring data collected from monitoring stations in the project area were used to establish the ambient background levels for the construction impact modeling analysis. Table 5.1F-4 shows the maximum concentrations of NOx, SO_2, CO, PM_{10} and $PM_{2.5}$ recorded for 2008 through 2010, and the location where the data were collected.

TABLE 5.1F-4
Highest Reported Background Concentrations in the Project Area ($\mu g/m^3$)

Pollutant	Averaging Time	2008	2009	2010
Trona (San Bernardino County)				
NO_2	1 hour (1st high)	117	92.1	97.8
	1 hour (98th percentile)[b]	80.8	73.3	79.0
	Annual	7.5	7.5	--[a]
SO_2	1 hour	93.6	28.6	31.2
	3 hours	15.6	20.8	23.4
	24 hours	13.1	7.9	10.5
	Annual	2.7	2.7	--[a]
Barstow (San Bernardino County)				
CO	1 hour	1,750	1,125	1,125
	8 hours (CA. 1st high)	1,333	1,000	--[a]
Jean, NV				
PM_{10}	24 hours	96	81.3	49
	Annual (CA)	14	12.4	8.5
$PM_{2.5}$	24 hours (3-yr avg, 98th Percentile)[b,c]	10.3	11.2	11.4
	Nat'l 3-Year Avg AAM [d]	4.9	4.0	3.5

Notes:

[a] Insufficient data.

TABLE 5.1F-4
Highest Reported Background Concentrations in the Project Area (µg/m^3)

[b] Calculated from http://www.epa.gov/mxplorer/index.htm, “Query Concentrations” function

[c] See Table 5 of the modeling protocol in Appendix 5.1H.

[d] Annual arithmetic mean

Dispersion Model

The EPA guideline AERMOD modeling system was used to estimate ambient impacts from construction activities.

The emission sources for the construction site were grouped into three categories: exhaust emissions, construction dust emissions, and windblown dust emissions. The exhaust and construction dust emissions were modeled as 26 volume sources with a vertical dimension of 6 meters. Among the 26 volume sources, 24 were totally within the boundary of the facility site, to represent the construction dust and combustion exhaust sources from the facility site, and 2 volume sources fell into both the laydown area and the facility site, to represent both the construction dust and combustion exhaust sources from the laydown area, and partially from the facility site. Based on the width of the construction area, the horizontal dimension for each volume source was set to 563.8 meters, with sigma-y = 131.1. The fugitive dust emissions from disturbed areas were represented for modeling purposes as area sources. To assess impacts from fugitive dust, the facility site and the laydown area were modeled as one single area source covering a combined disturbed area of 2959.2 acres. The effective plume height for these two area sources was set at 0.5 meters in the modeling analysis.

The construction impacts modeling analysis receptor set excluded the areas under the applicant’s control, including the HHSEGS property and the laydown and parking areas that will be fenced and used for equipment and workers’ vehicles during the construction period.

To determine the construction impacts on short-term ambient standards (24 hours and less), the worst-case daily onsite construction emission levels shown in Table 5.1F-1 were used. For pollutants with annual average ambient standards, the annual onsite emission levels shown in Table 5.1F-2 were used.

As with the refined modeling discussed in Section 5.1, the construction impact modeling was performed using the five-year Pahrump, NV, monitoring station meteorological data set.

Modeling Results

Based on the emission rates of NOx, SO_2, CO, PM_{10} and $PM_{2.5}$ and the meteorological data, the AERMOD model calculates hourly and annual ambient impacts for each pollutant. As mentioned above, the modeled 1-hour, 3-hour, 8-hour, and 24-hour ambient impacts are based on the worst-case daily emission rates of NOx, SO_2, CO, PM_{10} and $PM_{2.5}$. The annual impacts are based on the annual emission rates of these pollutants.

The 1-hour and annual average concentrations of NO_2 were computed in accordance with the procedures described in the modeling protocol (Appendix 5.1H).

The modeling analysis results are shown in Table 5.1F-5. Also included in the table are the maximum background levels that have occurred in the last three years and the resulting total ambient impacts. Construction impacts alone for all modeled pollutants are expected to be below the most stringent state and national standards. With the exception of the 24-hour and annual average PM_{10} standards, construction activities are not expected to cause an exceedance of state or federal ambient air quality standards. However, the background state 24-hour standard is exceeded in the absence of the construction emissions for the project.

The dust mitigation measures already proposed by the applicant are expected to be effective in minimizing fugitive dust emissions.

TABLE 5.1F-5
Modeled Maximum Impacts from Onsite Construction Activities

Pollutant	Averaging Period	Maximum Predicted Impact (µg/m^3)	Maximum Background Concentration (µg/m^3)	Total Concentration[a] (µg/m^3)	NAAQS (µg/m^3)	CAAQS (µg/m^3)
NO_2	1-hr (highest)	100.1	117	217	--	339
	1-hr (98th percntl)	85.8	80.8	167	188	--
	Annual	3.4	7.5	11	100	57
SO_2	1-hr	0.2	93.6	94	196	655
	3-hr	0.2	23.4	24	1300	--
	24-hr	0.05	13.1	13	--	105
	Annual	0.01	2.7	2.7	80	--
CO	1-hr	62.9	1,750	1,813	40,000	23,000
	8-hr	26.7	1,333	1,360	10,000	20.000
PM_{10}	24-hr	24.2	96	120	150	50
	Annual	1.4	14	15	--	20
$PM_{2.5}$	24-hr[b]	5.1	11.4	17	35	--
	Annual[c]	0.3	4.9	5.2	15.0	12

Notes:

[a] Total concentrations shown in this table are the sum of the maximum predicted impact and the maximum measured background concentration. Because the maximum impact will not occur at the same time as the maximum background concentration, the actual maximum combined impact will be lower.

[b] Background concentration shown is the three-year average of the 98th percentile values, in accordance with the form of the federal standard. Table 5.1F-8, footnote c.

[c] Background value shown is the three-year average of the annual arithmetic mean, in accordance with the form of the standard.

Maximum PM_{10} and $PM_{2.5}$ impacts occur on the project site fenceline, and concentrations decrease rapidly within a couple of hundred meters or less of the project site. PM_{10} and $PM_{2.5}$ impacts are extremely localized.

The project construction site impacts are not unusual in comparison to most construction project analyses. Construction sites that use good dust suppression techniques and low-emitting vehicles typically do not cause exceedances of air quality standards. The input and output modeling files are being provided electronically.

Health Risk of Diesel Exhaust

The combustion portion of annual PM_{10} emissions from Table 5.1F-2 above was modeled separately to determine the annual average Diesel PM_{10} exhaust concentration. This was used with HARP-derived risk values for Diesel particulate matter for a nine-year exposure to determine the potential carcinogenic risk from Diesel exhaust during construction.[4]

The maximum modeled annual average concentration of Diesel particulate matter at any location is 0.139 $\mu g/m^3$. The cancer unit risk value obtained from HARP for a 9-year exposure is 5.33×10^{-5} per $\mu g/m^3$ (derived adjusted method). Therefore, the carcinogenic risk due to exposure to Diesel exhaust during construction activities is expected to be approximately 7.4 in one million. This risk estimate is below the significance level of 10 in one million. This analysis remains conservative because of the inherently conservative assumptions made in the modeling analysis.

---

[4] OEHHA, "Adoption of Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments," 10/03/03, accessed at http://www.oehha.ca.gov/air/hot_spots/HRAguidefinal.html

Attachment 5.1F-1

Detailed Construction Emissions Calculations

Hidden Hills Summary of Construction Emissions

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

Daily and Annual Construction Emissions

Daily Construction Emissions (during peak month)						
(lbs/day)						
	NOx	CO	VOC	SOx	PM2.5	PM10
Onsite						
Construction Equipment	349.84	181.25	25.89	0.65	15.20	15.20
Fugitive Dust					11.97	104.94
Batch Plant					10.62	70.80
Subtotal =	349.84	181.25	25.89	0.65	37.79	190.95
Offsite						
Worker Travel	159.39	2223.94	234.22	0.00	5.10	8.15
Truck Deliveries	1198.41	554.11	111.68	1.52	37.80	47.25
Subtotal =	1357.81	2778.04	345.90	1.52	42.90	55.40
Total =	1707.65	2959.30	371.79	2.16	80.69	246.35

Annual Construction Emissions (during peak 12-month period) (tons/yr)						
	NOx	CO	VOC	SOx	PM2.5	PM10
Onsite						
Construction Equipment	31.24	16.55	2.31	0.06	1.28	1.28
Fugitive Dust					1.04	8.79
Batch Plant					0.38	2.55
Subtotal =	31.24	16.55	2.31	0.06	2.70	12.62
Offsite						
Worker Travel	21.35	297.82	31.37	0.00	0.68	1.09
Truck Deliveries	9.59	4.43	0.89	0.01	0.30	0.38
Subtotal =	30.93	302.26	32.26	0.01	0.99	1.47
Total =	62.17	318.80	34.57	0.07	3.69	14.09

Hidden Hills Greenhouse Gas Emission Calculations: Construction Perioc

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA - Construction Equipment GHG Emissions

Diesel Fuel Used (gallons/ year)	Diesel HHV (MMBtu/ gallon)	CO_2 Emission Factor[a] (kg/gallon)	CH_4 Emission Factor[b] (kg/MMBtu)	N_2O Emission Factor[b] (kg/MMBtu)	Global Warming Potential Factor[c] for CO_2	Global Warming Potential Factor[c] for CH_4	Global Warming Potential Factor[c] for N_2O	Warming Potential CO_2 Emissions as CO_2e (MT/year)	Warming Potential CH_4 Emissions as CO_2e (MT/year)	Warming Potential N_2O Emissions as CO_2e (MT/year)	Total (MT/year)
434,072	0.137	9.96	0.003	0.0006	1	21	310	4,323	4	11	4,338

Notes:

a. CARB Regulation for the Mandatory reporting of Greenhouse Gas Emissions, December 2, 2008, Appendix A, Table 7

b. CARB Regulation for the Mandatory reporting of Greenhouse Gas Emissions, December 2, 2008, Appendix A, Table 6

c. CARB Regulation for the Mandatory reporting of Greenhouse Gas Emissions, December 2, 2008, Appendix A, Table 6

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA - Construction Worker and Deliveries GHG Emissions

Vehicle	Annual Vehicle Trips	Average Round Trip Haul Distance (miles)	Vehicle Miles Traveled Per Year	GHG Emission Factors (lbs/mile) CO2[a]	CH4[b]	N2O[b]	Global Warming Potential Factor[c] for CO2	Global Warming Potential Factor[c] for CH4	Global Warming Potential Factor[c] for N2O	Global Warming Potential CO2 Emiss. as CO2e (lbs/year)	Global Warming Potential CH4 Emiss. as CO2e (lbs/year)	Global Warming Potential N2O Emiss. as CO2e (lbs/year)	Total CO2e (lbs/year)	Total CO2e (MT/year)
Truck	6,151	100.00	615,100	4.1	1.12E-05	1.06E-05	1	21	310	2,542,872	145	2,016	2,545,033	1,154
Worker	255,922	100	25,592,160	0.9	3.92E-05	6.01E-05	1	21	310	23,568,801	21,071	477,063	24,066,935	10,917
Total										26,111,672	21,216	479,079	26,611,967	12,071

Notes:

a. Emfac2007 V2.3, Stanislaus County, all HHD Diesel and light duty gasoline vehicle models in the range from1966 to 201

b. CARB Final Emission Factors for Mandatory Reporting Program, December 2, 2008, emission factors onroad vehicles, heavy Diesel trucks and gasoline light duty vehicles (2000 average model year

c. CARB Final Emission Factors for Mandatory Reporting Program, December 2, 2008, global warming potential table

Hidden Hills Modeled Construction Emissions

Short Term Impacts (24 hours and less)					
	NOx	CO	SOx	PM2.5	PM10
TOTAL					
Combustion (lbs/day)	3.498E+02	1.813E+02	6.466E-01	1.520E+01	1.520E+01
Combustion (hrs/day)	2.100E+01	2.100E+01	2.100E+01	2.100E+01	2.100E+01
Combustion (lbs/hr)	1.666E+01	8.631E+00	3.079E-02	7.239E-01	7.239E-01
Combustion (g/sec)	2.099E+00	1.088E+00	3.880E-03	9.121E-02	9.121E-02
No. of volume sources	2.600E+01	2.600E+01	2.600E+01	2.600E+01	2.600E+01
Each volume source (g/s)	8.073E-02	4.183E-02	1.492E-04	3.508E-03	3.508E-03
Construction Dust (lbs/day)				1.169E+01	1.042E+02
Construction Dust (hrs/day)				2.100E+01	2.100E+01
Construction Dust (lbs/hr)				5.568E-01	4.964E+00
Construction Dust (g/sec)				7.016E-02	6.255E-01
No. of volume sources				2.600E+01	2.600E+01
Each volume source (g/s)				2.698E-03	2.406E-02
Windblown Dust (lbs/day)				2.776E-01	6.941E-01
Windblown Dust (hrs/day)				2.400E+01	2.400E+01
Windblown Dust (lbs/hr)				4.425E-01	2.950E+00
Windblown Dust (g/sec)				5.576E-02	3.717E-01
Windblown Dust (g/sec.m2)				4.656E-09	3.104E-08
Batch Plant (lb/day)				1.062E+01	7.080E+01
Batch Plant (hrs/day)				2.100E+01	2.100E+01
Batch Plant (lbs/hr)				5.057E-01	3.372E+00
Batch Plant (g/sec)				6.372E-02	4.248E-01
No. of volume sources				2.600E+01	2.600E+01
Each volume source (g/s)				2.451E-03	1.634E-02
Size of area source to use				1.198E+07	m2
Construction Shift				2.880E+02	days/year

Long Term Impacts (annual)					
	NOx	CO	SOx	PM2.5	PM10
TOTAL					
Combustion (tons/yr)	3.124E+01	1.655E+01	5.579E-02	1.280E+00	1.280E+00
Combustion (days/yr)	2.880E+02	2.880E+02	2.880E+02	2.880E+02	2.880E+02
Combustion (hrs/day)	2.100E+01	2.100E+01	2.100E+01	2.100E+01	2.100E+01
Combustion (lbs/hr)	1.033E+01	5.472E+00	1.845E-02	4.233E-01	4.233E-01
Combustion (g/sec)	1.301E+00	6.894E-01	2.324E-03	5.334E-02	5.334E-02
No. of volume sources	2.600E+01	2.600E+01	2.600E+01	2.600E+01	2.600E+01
Each volume source (g/s)	5.006E-02	2.652E-02	8.940E-05	2.052E-03	2.052E-03
Construction Dust (tons/yr)				9.989E-01	8.692E+00
Construction Dust (days/yr)				2.880E+02	2.880E+02
Construction Dust (hrs/day)				2.100E+01	2.100E+01
Construction Dust (lbs/hr)				3.303E-01	2.874E+00
Construction Dust (g/sec)				4.162E-02	3.621E-01
No. of volume sources				2.600E+01	2.600E+01
Each volume source (g/s)				1.601E-03	1.393E-02
Windblown Dust (tons/yr)				3.998E-02	9.995E-02
Windblown Dust (days/yr)				3.650E+02	3.650E+02
Windblown Dust (hrs/day)				2.400E+01	2.400E+01
Windblown Dust (lbs/hr)				9.128E-03	2.282E-02
Windblown Dust (g/sec)				1.150E-03	2.875E-03
Windblown Dust (g/sec.m2)				9.604E-11	2.401E-10
Batch Plant (tons/yr)				3.823E-01	2.549E+00
Batch Plant (days/yr)				2.880E+02	2.880E+02
Batch Plant (hrs/day)				2.100E+01	2.100E+01
Batch Plant (lbs/hr)				1.264E-01	8.429E-01
Batch Plant (g/sec)				1.593E-02	1.062E-01
No. of volume sources				2.600E+01	2.600E+01
Each volume source (g/s)				6.127E-04	4.085E-03

Hidden Hills Construction Worker and Deliveries Schedule

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

Year	2013															
Calendar Month	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Project Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Construction Workers																
Craft-day shift	0	0	44	88	139	556	625	690	725	746	756	756	786	806	795	812
Non-Craft-day shift	0	0	15	19	25	24	32	32	32	32	33	35	35	35	38	38
Craft-swing shift	0	0	0	0	0	60	60	60	60	60	60	60	60	60	60	60
Non-Craft-swing shift	0	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3
Compliance Support	0	0	80	80	30	30	30	30	30	30	30	30	30	30	80	80
Owners/Others	0	0	15	25	40	40	40	40	40	40	40	40	40	40	40	40
Deliveries																
Equipment and Materials	0	0	35	440	420	407	472	438	411	112	120	148	141	137	165	171
Concrete	0	0	20	40	0	0	0	0	0	0	0	0	0	0	0	0
Heliostat Componants	0	0	0	0	245	245	245	245	245	245	246	246	246	246	246	246
Total Construction Workers	0	0	154	212	234	713	790	855	890	911	922	924	954	974	1016	1033
Average Construction Workers																
Total Deliveries	0	0	55	480	665	652	717	683	656	357	366	394	387	383	411	417
Average Deliveries																

Natural Gas Pipeline--Clark Co., NV

Year	2013															
Calendar Month	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Project Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Construction Workers	0	0	0	0	0	0	0	0	0	0	0	0	2	2	21	21
Compliance															3	3
Total Gas Pipeline Construction Workers	0	0	0	0	0	0	0	0	0	0	0	0	2	2	24	24
Average Construction Workers																

Transmission Lines--Clark and Nye Cos., NV

Year	2013															
Calendar Month	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Project Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Construction Workers	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	15
Compliance															3	3
Total Gas Pipeline Construction Workers	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6	18
Average Construction Workers																

Hidden Hills Construction Worker and De

Hidden Hills Solar Electric Generating Sy

Year	2014							2015								
Calendar Month	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Peak
Project Month	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	for Annual
Construction Workers																
Craft-day shift	853	840	785	778	724	665	633	269	225	181	131	88	44	30	20	
Non-Craft-day shift	38	38	38	38	37	36	35	37	36	33	30	27	20	8	5	
Craft-swing shift	60	60	60	60	60	60	60	0	0	0	0	0	0	0	0	
Non-Craft-swing shift	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0	
Compliance Support	30	30	20	20	10	10	10	5	5	5	5	5	5	5	5	
Owners/Others	40	40	40	40	40	40	40	40	40	35	30	25	15	10	5	
Deliveries																
Equipment and Materials	135	127	122	98	94	91	65	55	43	36	28	28	10	0	0	
Concrete	20	10	10	10	10	5	5	0	0	0	0	0	0	0	0	
Heliostat Componants	245	245	245	245	245	245		0	0	0	0	0	0	0	0	
Total Construction Workers	1024	1011	946	939	874	814	781	351	306	254	196	145	84	53	35	961
Average Construction Workers															634	12-Mo. Rolling Average
Total Deliveries	400	382	377	353	349	341	70	55	43	36	28	28	10	0	0	6,151
Average Deliveries															314	12-Mo. Rolling Total

Natural Gas Pipeline--Clark Co., NV

Year	2014							2015								
Calendar Month	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Peak
Project Month	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	for Annual
Construction Workers	21	21	21	30	0	0	0	0	0	0	0	0	0	0	0	
Compliance	3	3	3	3	2	2	2	2	0	1						
Total Gas Pipeline Construction Workers	24	24	24	33	2	2	2	2	0	1	0	0	0	0	0	14
Average Construction Workers															6	12-Mo. Rolling Average

Transmission Lines--Clark and Nye Cos.,

Year	2014							2015								
Calendar Month	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Peak
Project Month	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	for Annual
Construction Workers	36	39	37	37	29	10	10	6	0	5	0	0	0	0	0	
Compliance	3	3	3	3	2	2	2	2	0	1						
Total Gas Pipeline Construction Workers	39	42	40	40	31	12	12	8	0	6	0	0	0	0	0	21
Average Construction Workers															9	12-Mo. Rolling Average

```
Title    : Hidden Hills Onroad - GVB
Version  : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/06/13 05:37:40
Scen Year: 2013 -- All model years in the range 1969 to 2013 selected
Season   : Annual
Area     : Great Basin Valleys Air Basin Avera
I/M Stat : COO Basic (2005) -- Using I/M schedule for area 1 Alpine (GBV)
Emissions: Tons Per Day
****************************************************************************************************************************************************************************************
                              LDA-NCAT   LDA-CAT   LDA-DSL   LDA-TOT LDT1-NCAT  LDT1-CAT  LDT1-DSL  LDT1-TOT LDT2-NCAT  LDT2-CAT  LDT2-DSL  LDT2-TOT  MDV-NCAT   MDV-CAT   MDV-DSL   MDV-TOT LHDT1-NCA LHDT1-CAT LHDT1-DSL LHDT1-TOT LHDT2-NCA
Vehicles                           122     11043        75     11239       360     11376       793     12528        86      8999        68      9154         0         0         0         0         0         0         0         0         0
VMT/1000                             2       403         2       406         7       378        24       409         2       333         2       336         0         0         0         0         0         0         0         0         0
Trips                              473     68642       424     69539      1425     68264      4781     74470       342     56104       406     56852         0         0         0         0         0         0         0         0         0
Total Organic Gas Emissions
Run Exh                           0.01      0.05         0      0.06      0.05      0.11         0      0.17      0.01      0.05         0      0.07         0         0         0         0         0         0         0         0         0
Idle Exh                             0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
Start Ex                             0      0.05         0      0.06      0.01      0.09         0      0.11         0      0.05         0      0.06         0         0         0         0         0         0         0         0         0
                               -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------
Total Ex                          0.02       0.1         0      0.12      0.07      0.21         0      0.28      0.02      0.11         0      0.12         0         0         0         0         0         0         0         0         0

Diurnal                              0      0.01         0      0.01         0      0.01         0      0.01         0      0.01         0      0.01         0         0         0         0         0         0         0         0         0
Hot Soak                             0      0.02         0      0.02         0      0.03         0      0.03         0      0.01         0      0.01         0         0         0         0         0         0         0         0         0
Running                           0.01      0.04         0      0.05      0.01      0.14         0      0.16         0      0.07         0      0.07         0         0         0         0         0         0         0         0         0
Resting                              0         0         0         0         0      0.01         0      0.01         0         0         0         0         0         0         0         0         0         0         0         0         0
                               -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------
Total                             0.03      0.17         0       0.2      0.09       0.4         0      0.49      0.02       0.2         0      0.22         0         0         0         0         0         0         0         0         0
Carbon Monoxide Emissions
Run Exh                           0.17      1.02         0      1.19      0.71      2.73      0.01      3.45      0.17      1.25         0      1.42         0         0         0         0         0         0         0         0         0
Idle Exh                             0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
Start Ex                          0.02      0.64         0      0.66      0.05      1.24         0      1.29      0.01      0.67         0      0.69         0         0         0         0         0         0         0         0         0
                               -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------
Total Ex                          0.18      1.66         0      1.84      0.76      3.97      0.01      4.74      0.18      1.92         0      2.11         0         0         0         0         0         0         0         0         0
Oxides of Nitrogen Emissions
Run Exh                           0.01      0.13         0      0.15      0.04      0.34      0.04      0.42      0.01      0.23         0      0.24         0         0         0         0         0         0         0         0         0
Idle Exh                             0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
Start Ex                             0      0.04         0      0.04         0      0.05         0      0.06         0      0.05         0      0.05         0         0         0         0         0         0         0         0         0
                               -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------
Total Ex                          0.01      0.17         0      0.18      0.04      0.39      0.04      0.48      0.01      0.29         0       0.3         0         0         0         0         0         0         0         0         0
Carbon Dioxide Emissions (000)
Run Exh                              0      0.16         0      0.16         0      0.18      0.01       0.2         0      0.16         0      0.16         0         0         0         0         0         0         0         0         0
Idle Exh                             0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
Start Ex                             0      0.01         0      0.01         0      0.01         0      0.01         0      0.01         0      0.01         0         0         0         0         0         0         0         0         0
                               -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------
Total Ex                             0      0.16         0      0.16         0      0.19      0.01       0.2         0      0.17         0      0.17         0         0         0         0         0         0         0         0         0
PM10 Emissions
Run Exh                              0         0         0      0.01         0      0.01         0      0.01         0      0.01         0      0.01         0         0         0         0         0         0         0         0         0
Idle Exh                             0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
Start Ex                             0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
                               -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------
Total Ex                             0      0.01         0      0.01         0      0.01         0      0.01         0      0.01         0      0.01         0         0         0         0         0         0         0         0         0

TireWear                             0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
BrakeWr                              0      0.01         0      0.01         0      0.01         0      0.01         0         0         0         0         0         0         0         0         0         0         0         0         0
                               -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------   -------
Total                                0      0.01         0      0.01         0      0.02         0      0.02         0      0.02         0      0.02         0         0         0         0         0         0         0         0         0
Lead                                 0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
SOx                                  0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
Fuel Consumption (000 gallons)
Gasoline                          0.14        17         0     17.14      0.56     20.32         0     20.88      0.13     17.62         0     17.76         0         0         0         0         0         0         0         0         0
Diesel                               0         0      0.06      0.06         0         0      0.82      0.82         0         0      0.07      0.07         0         0         0         0         0         0         0         0         0
Title    : Hidden Hills Onroad PM2.5 - Statewide
Version  : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/06/13 05:37:40
Scen Year: 2013 -- All model years in the range 1969 to 2013 selected
Season   : Annual
Area     : Statewide totals Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day
****************************************************************************************************************************************************************************************
                              LDA-NCAT   LDA-CAT   LDA-DSL   LDA-TOT LDT1-NCAT  LDT1-CAT  LDT1-DSL  LDT1-TOT LDT2-NCAT  LDT2-CAT  LDT2-DSL  LDT2-TOT  MDV-NCAT   MDV-CAT   MDV-DSL   MDV-TOT LHDT1-NCA LHDT1-CAT LHDT1-DSL LHDT1-TOT LHDT2-NCA
Vehicles                         71588  14148500     28949  14249000     45562   2945190    129337   3120090     26018   5921690     11298   5959010         0         0         0         0         0         0         0         0         0
```

Title   : Hidden Hills Onroad - GVB
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/06/13 05:37:40
Scen Year: 2013 -- All model years in th
Season   : Annual
Area   : Great Basin Valleys Air Basin A
I/M Stat : COO Basic (2005) -- Using I/M
Emissions: Tons Per Day
****

	LHDT2-CAT	LHDT2-DSL	LHDT2-TOT	MHDT-NCA	MHDT-CAT	MHDT-DSL	MHDT-TOT	HHDT-NCA	HHDT-CAT	HHDT-DSL	HHDT-TOT	OBUS-NCA	OBUS-CAT	OBUS-DSL	OBUS-TOT	SBUS-NCA	SBUS-CAT	SBUS-DSL	SBUS-TOT	UB-NCAT	UB-CAT
Vehicles	0	0	0	0	0	0	0	12	20	1191	1223	0	0	0	0	0	0	0	0	0	0
VMT/1000	0	0	0	0	0	0	0	0	2	177	179	0	0	0	0	0	0	0	0	0	0
Trips	0	0	0	0	0	0	0	571	923	6025	7519	0	0	0	0	0	0	0	0	0	0
Total Organic Gas Emissions																					
Run Exh	0	0	0	0	0	0	0	0	0	0.2	0.2	0	0	0	0	0	0	0	0	0	0
Idle Exh	0	0	0	0	0	0	0	0	0	0.03	0.03	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0.02	0.01	0	0.02	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0.02	0.01	0.23	0.26	0	0	0	0	0	0	0	0	0	0
Diurnal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hot Soak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Running	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Resting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total	0	0	0	0	0	0	0	0.02	0.01	0.23	0.26	0	0	0	0	0	0	0	0	0	0
Carbon Monoxide Emissions																					
Run Exh	0	0	0	0	0	0	0	0.1	0.07	0.7	0.87	0	0	0	0	0	0	0	0	0	0
Idle Exh	0	0	0	0	0	0	0	0	0	0.11	0.11	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0.17	0.13	0	0.3	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0.27	0.2	0.81	1.29	0	0	0	0	0	0	0	0	0	0
Oxides of Nitrogen Emissions																					
Run Exh	0	0	0	0	0	0	0	0	0.02	2.5	2.53	0	0	0	0	0	0	0	0	0	0
Idle Exh	0	0	0	0	0	0	0	0	0	0.25	0.25	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0.01	0	0.01	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0.01	0.03	2.75	2.79	0	0	0	0	0	0	0	0	0	0
Carbon Dioxide Emissions (000)																					
Run Exh	0	0	0	0	0	0	0	0	0	0.36	0.36	0	0	0	0	0	0	0	0	0	0
Idle Exh	0	0	0	0	0	0	0	0	0	0.01	0.01	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0.37	0.37	0	0	0	0	0	0	0	0	0	0
PM10 Emissions																					
Run Exh	0	0	0	0	0	0	0	0	0	0.09	0.09	0	0	0	0	0	0	0	0	0	0
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0
TireWear	0	0	0	0	0	0	0	0	0	0.01	0.01	0	0	0	0	0	0	0	0	0	0
BrakeWr	0	0	0	0	0	0	0	0	0	0.01	0.01	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total	0	0	0	0	0	0	0	0	0	0.11	0.11	0	0	0	0	0	0	0	0	0	0
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fuel Consumption (000 gallons)																					
Gasoline	0	0	0	0	0	0	0	0.07	0.16	0	0.23	0	0	0	0	0	0	0	0	0	0
Diesel	0	0	0	0	0	0	0	0	0	33.39	33.39	0	0	0	0	0	0	0	0	0	0

Title   : Hidden Hills Onroad PM2.5 - Sta
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/06/13 05:37:40
Scen Year: 2013 -- All model years in th
Season   : Annual
Area   : Statewide totals Average
I/M Stat : Enhanced Interim (2005) -- Us
Emissions: Tons Per Day
****

	LHDT2-CAT	LHDT2-DSL	LHDT2-TOT	MHDT-NCA	MHDT-CAT	MHDT-DSL	MHDT-TOT	HHDT-NCA	HHDT-CAT	HHDT-DSL	HHDT-TOT	OBUS-NCA	OBUS-CAT	OBUS-DSL	OBUS-TOT	SBUS-NCA	SBUS-CAT	SBUS-DSL	SBUS-TOT	UB-NCAT	UB-CAT
Vehicles	0	0	0	0	0	0	0	841	8598	232401	241840	0	0	0	0	0	0	0	0	0	0

Title   : Hidden Hills Onroad - GVB
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/06/13 05:37:40
Scen Year: 2013 -- All model years in th
Season   : Annual
Area   : Great Basin Valleys Air Basin /
I/M Stat : COO Basic (2005) -- Using I/M
Emissions: Tons Per Day
****

	UB-DSL	UB-TOT	MH-NCAT	MH-CAT	MH-DSL	MH-TOT	MCY-NCAT	MCY-CAT	MCY-DSL	MCY-TOT	ALL-TOT
Vehicles	0	0	0	0	0	0	0	0	0	0	34145
VMT/1000	0	0	0	0	0	0	0	0	0	0	1331
Trips	0	0	0	0	0	0	0	0	0	0	208380
Total Organic Gas Emissions											
Run Exh	0	0	0	0	0	0	0	0	0	0	0.5
Idle Exh	0	0	0	0	0	0	0	0	0	0	0.03
Start Ex	0	0	0	0	0	0	0	0	0	0	0.25
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0	0.78
Diurnal	0	0	0	0	0	0	0	0	0	0	0.03
Hot Soak	0	0	0	0	0	0	0	0	0	0	0.06
Running	0	0	0	0	0	0	0	0	0	0	0.29
Resting	0	0	0	0	0	0	0	0	0	0	0.01
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total	0	0	0	0	0	0	0	0	0	0	1.17
Carbon Monoxide Emissions											
Run Exh	0	0	0	0	0	0	0	0	0	0	6.93
Idle Exh	0	0	0	0	0	0	0	0	0	0	0.11
Start Ex	0	0	0	0	0	0	0	0	0	0	2.93
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0	9.98
Oxides of Nitrogen Emissions											
Run Exh	0	0	0	0	0	0	0	0	0	0	3.34
Idle Exh	0	0	0	0	0	0	0	0	0	0	0.25
Start Ex	0	0	0	0	0	0	0	0	0	0	0.16
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0	3.75
Carbon Dioxide Emissions (000)											
Run Exh	0	0	0	0	0	0	0	0	0	0	0.88
Idle Exh	0	0	0	0	0	0	0	0	0	0	0.01
Start Ex	0	0	0	0	0	0	0	0	0	0	0.02
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0	0.91
PM10 Emissions											
Run Exh	0	0	0	0	0	0	0	0	0	0	0.11
Idle Exh	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0	0.12
TireWear	0	0	0	0	0	0	0	0	0	0	0.02
BrakeWr	0	0	0	0	0	0	0	0	0	0	0.02
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total	0	0	0	0	0	0	0	0	0	0	0.16
Lead	0	0	0	0	0	0	0	0	0	0	0
SOx	0	0	0	0	0	0	0	0	0	0	0.01
Fuel Consumption (000 gallons)											
Gasoline	0	0	0	0	0	0	0	0	0	0	56
Diesel	0	0	0	0	0	0	0	0	0	0	34.34

Title   : Hidden Hills Onroad PM2.5 - St
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/06/13 05:37:40
Scen Year: 2013 -- All model years in th
Season   : Annual
Area   : Statewide totals Average
I/M Stat : Enhanced Interim (2005) -- Us
Emissions: Tons Per Day
****

	UB-DSL	UB-TOT	MH-NCAT	MH-CAT	MH-DSL	MH-TOT	MCY-NCAT	MCY-CAT	MCY-DSL	MCY-TOT	ALL-TOT
Vehicles	0	0	0	0	0	0	0	0	0	0	23570000

```
Title    : Hidden Hills Onroad PM2.5 - Statewide
Version  : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/06/13 05:37:40
Scen Year: 2013 -- All model years in the range 1969 to 2013 selected
Season   : Annual
Area     : Statewide totals Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day
*****************************************************************************************************************************************************************************
                               LDA-NCAT   LDA-CAT    LDA-DSL    LDA-TOT    LDT1-NCAT  LDT1-CAT   LDT1-DSL   LDT1-TOT   LDT2-NCAT  LDT2-CAT   LDT2-DSL   LDT2-TOT   MDV-NCAT   MDV-CAT    MDV-DSL
Vehicles                            71588   14148500      28949   14249000      45562    2945190     129337    3120090      26018    5921690      11298    5959010          0          0          0
VMT/1000                             1102     479642        633     481376        861     103331       3727     107919        504     213994        303     214801          0          0          0
Trips                              278082   88774300     152701   89205100     178498   18227800     775381   19181700     102162   37130000      64389   37296600          0          0          0
Total Organic Gas Emissions
Run Exh                              8.16      32.23       0.12      40.51       6.44      10.58       0.34      17.36       3.82      20.71       0.04      24.56          0          0          0
Idle Exh                                0          0          0          0          0          0          0          0          0          0          0          0          0          0          0
Start Ex                             1.73      35.57          0       37.3       1.11       9.41          0      10.52       0.63      19.02          0      19.65          0          0          0
                               -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------
Total Ex                              9.9      67.79       0.12      77.81       7.55      19.99       0.34      27.88       4.45      39.73       0.04      44.22          0          0          0

Diurnal                              0.47       9.37          0       9.84       0.29       2.69          0       2.98       0.17       4.17          0       4.34          0          0          0
Hot Soak                             0.93      16.23          0      17.16       0.61       4.18          0       4.79       0.35       7.01          0       7.36          0          0          0
Running                              5.14      38.95          0      44.09       1.73      18.63          0      20.36       0.98      31.71          0      32.68          0          0          0
Resting                               0.3       5.95          0       6.25       0.19       1.72          0       1.91       0.11       2.73          0       2.85          0          0          0
                               -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------
Total                               16.73      138.3       0.12     155.15      10.37      47.21       0.34      57.93       6.05      85.35       0.04      91.45          0          0          0
Carbon Monoxide Emissions
Run Exh                             92.05     866.39       0.52     958.97      71.22     311.78       2.36     385.36      41.72      573.4       0.23     615.35          0          0          0
Idle Exh                                0          0          0          0          0          0          0          0          0          0          0          0          0          0          0
Start Ex                             9.13     409.72          0     418.85       5.96     123.38          0     129.34       3.39      232.8          0     236.19          0          0          0
                               -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------
Total Ex                           101.18    1276.11       0.52    1377.82      77.18     435.16       2.36      514.7      45.11     806.19       0.23     851.53          0          0          0
Oxides of Nitrogen Emissions
Run Exh                               5.4      80.39       1.02      86.81       4.16      28.84        6.1       39.1       2.41      74.76       0.49      77.66          0          0          0
Idle Exh                                0          0          0          0          0          0          0          0          0          0          0          0          0          0          0
Start Ex                             0.43      26.69          0      27.12       0.27       6.91          0       7.18       0.16      21.37          0      21.52          0          0          0
                               -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------
Total Ex                             5.83     107.08       1.02     113.93       4.43      35.75        6.1      46.29       2.57      96.13       0.49      99.18          0          0          0
Carbon Dioxide Emissions (000)
Run Exh                              0.63     200.69       0.25     201.57       0.48      53.16       1.42      55.06       0.29     112.13       0.12     112.53          0          0          0
Idle Exh                                0          0          0          0          0          0          0          0          0          0          0          0          0          0          0
Start Ex                             0.06       7.04          0        7.1       0.04       1.81          0       1.84       0.02       3.69          0       3.71          0          0          0
                               -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------
Total Ex                             0.69     207.73       0.25     208.66       0.52      54.96       1.42      56.91       0.31     115.82       0.12     116.24          0          0          0
PM2.5 Emissions
Run Exh                              0.03       5.66       0.07       5.76       0.02       1.47       0.18       1.67       0.01       6.12       0.02       6.16          0          0          0
Idle Exh                                0          0          0          0          0          0          0          0          0          0          0          0          0          0          0
Start Ex                                0       0.58          0       0.59          0       0.15          0       0.15          0       0.59          0       0.59          0          0          0
                               -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------
Total Ex                             0.03       6.24       0.07       6.35       0.02       1.62       0.18       1.82       0.02       6.71       0.02       6.75          0          0          0

TireWear                                0       1.06          0       1.06          0       0.23       0.01       0.24          0       0.47          0       0.47          0          0          0
BrakeWr                              0.01       2.84          0       2.85       0.01       0.61       0.02       0.64          0       1.27          0       1.27          0          0          0
                               -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------
Total                                0.04      10.14       0.08      10.26       0.03       2.46       0.21        2.7       0.02       8.45       0.03       8.49          0          0          0
Lead                                    0          0          0          0          0          0          0          0          0          0          0          0          0          0          0
SOx                                  0.01       2.01          0       2.03       0.01       0.53       0.01       0.55          0       1.12          0       1.13          0          0          0
Fuel Consumption (000 gallons)
Gasoline                             89.9   21491.62          0   21581.53       68.1    5702.74          0    5770.84      40.19   11998.26          0   12038.46          0          0          0
Diesel                                  0          0      22.44      22.44          0          0     128.21     128.21          0          0      10.52      10.52          0          0          0
```

Title : Hidden Hills Onroad PM2.5 - St
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/06/13 05:37:40
Scen Year: 2013 -- All model years in th
Season : Annual
Area : Statewide totals Average
I/M Stat : Enhanced Interim (2005) -- Us
Emissions: Tons Per Day
****

	MDV-TOT	LHDT1-NCA	LHDT1-CAT	LHDT1-DSL	LHDT1-TOT	LHDT2-NCA	LHDT2-CAT	LHDT2-DSL	LHDT2-TOT	MHDT-NCA	MHDT-CAT	MHDT-DSL	MHDT-TOT	HHDT-NCA	HHDT-CAT
Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	841	8598
VMT/1000	0	0	0	0	0	0	0	0	0	0	0	0	0	11	810
Trips	0	0	0	0	0	0	0	0	0	0	0	0	0	38399	392653
Total Organic Gas Emissions															
Run Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0.19	2.38
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0.82	1.87
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	1.01	4.26
Diurnal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hot Soak	0	0	0	0	0	0	0	0	0	0	0	0	0	0.02	0.02
Running	0	0	0	0	0	0	0	0	0	0	0	0	0	0.25	0.29
Resting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1.28	4.57
Carbon Monoxide Emissions															
Run Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	6.92	37.83
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	11.94	27.31
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	18.86	65.14
Oxides of Nitrogen Emissions															
Run Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0.26	9.24
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0.18	3.31
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0.44	12.55
Carbon Dioxide Emissions (000)															
Run Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.54
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.02
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0.02	0.56
PM2.5 Emissions															
Run Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
TireWear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BrakeWr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.03
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
Fuel Consumption (000 gallons)															
Gasoline	0	0	0	0	0	0	0	0	0	0	0	0	0	4.94	69.07
Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Title   : Hidden Hills Onroad PM2.5 - St
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/06/13 05:37:40
Scen Year: 2013 -- All model years in th
Season   : Annual
Area   : Statewide totals Average
I/M Stat : Enhanced Interim (2005) -- Us
Emissions: Tons Per Day
****

	HHDT-DSL	HHDT-TOT	OBUS-NCAT	OBUS-CAT	OBUS-DSL	OBUS-TOT	SBUS-NCAT	SBUS-CAT	SBUS-DSL	SBUS-TOT	UB-NCAT	UB-CAT	UB-DSL	UB-TOT	MH-NCAT
Vehicles	232401	241840	0	0	0	0	0	0	0	0	0	0	0	0	0
VMT/1000	41224	42044	0	0	0	0	0	0	0	0	0	0	0	0	0
Trips	1176070	1607120	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Organic Gas Emissions															
Run Exh	42.95	45.53	0	0	0	0	0	0	0	0	0	0	0	0	0
Idle Exh	5.39	5.39	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	2.69	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	48.34	53.61	0	0	0	0	0	0	0	0	0	0	0	0	0
Diurnal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hot Soak	0	0.04	0	0	0	0	0	0	0	0	0	0	0	0	0
Running	0	0.54	0	0	0	0	0	0	0	0	0	0	0	0	0
Resting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total	48.34	54.19	0	0	0	0	0	0	0	0	0	0	0	0	0
Carbon Monoxide Emissions															
Run Exh	152.92	197.68	0	0	0	0	0	0	0	0	0	0	0	0	0
Idle Exh	20.49	20.49	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	39.25	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	173.41	257.41	0	0	0	0	0	0	0	0	0	0	0	0	0
Oxides of Nitrogen Emissions															
Run Exh	487.03	496.53	0	0	0	0	0	0	0	0	0	0	0	0	0
Idle Exh	49.37	49.37	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	3.49	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	536.4	549.39	0	0	0	0	0	0	0	0	0	0	0	0	0
Carbon Dioxide Emissions (000)															
Run Exh	83.07	83.62	0	0	0	0	0	0	0	0	0	0	0	0	0
Idle Exh	2.84	2.84	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	85.91	86.49	0	0	0	0	0	0	0	0	0	0	0	0	0
PM2.5 Emissions															
Run Exh	19.14	19.16	0	0	0	0	0	0	0	0	0	0	0	0	0
Idle Exh	0.54	0.54	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	19.68	19.69	0	0	0	0	0	0	0	0	0	0	0	0	0
TireWear	0.41	0.41	0	0	0	0	0	0	0	0	0	0	0	0	0
BrakeWr	0.55	0.56	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total	20.64	20.67	0	0	0	0	0	0	0	0	0	0	0	0	0
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.82	0.83	0	0	0	0	0	0	0	0	0	0	0	0	0
Fuel Consumption (000 gallons)															
Gasoline	0	74.02	0	0	0	0	0	0	0	0	0	0	0	0	0
Diesel	7732.27	7732.27	0	0	0	0	0	0	0	0	0	0	0	0	0

```
Title    : Hidden Hills Onroad PM2.5 - St
Version  : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/06/13 05:37:40
Scen Year: 2013 -- All model years in th
Season   : Annual
Area     : Statewide totals Average
I/M Stat : Enhanced Interim (2005) -- Us
Emissions: Tons Per Day
*********************************************
                             MH-CAT    MH-DSL    MH-TOT    MCY-NCAT  MCY-CAT   MCY-DSL   MCY-TOT   ALL-TOT
Vehicles                            0         0         0         0         0         0         0  23570000
VMT/1000                            0         0         0         0         0         0         0    846140
Trips                               0         0         0         0         0         0         0 147290000
Total Organic Gas Emissions
Run Exh                             0         0         0         0         0         0         0    127.96
Idle Exh                            0         0         0         0         0         0         0      5.39
Start Ex                            0         0         0         0         0         0         0     70.17
                             -------   -------   -------   -------   -------   -------   -------   -------
Total Ex                            0         0         0         0         0         0         0    203.52

Diurnal                             0         0         0         0         0         0         0     17.17
Hot Soak                            0         0         0         0         0         0         0     29.34
Running                             0         0         0         0         0         0         0     97.68
Resting                             0         0         0         0         0         0         0     11.01
                             -------   -------   -------   -------   -------   -------   -------   -------
Total                               0         0         0         0         0         0         0    358.71
Carbon Monoxide Emissions
Run Exh                             0         0         0         0         0         0         0   2157.35
Idle Exh                            0         0         0         0         0         0         0     20.49
Start Ex                            0         0         0         0         0         0         0    823.63
                             -------   -------   -------   -------   -------   -------   -------   -------
Total Ex                            0         0         0         0         0         0         0   3001.46
Oxides of Nitrogen Emissions
Run Exh                             0         0         0         0         0         0         0     700.1
Idle Exh                            0         0         0         0         0         0         0     49.37
Start Ex                            0         0         0         0         0         0         0     59.32
                             -------   -------   -------   -------   -------   -------   -------   -------
Total Ex                            0         0         0         0         0         0         0    808.78
Carbon Dioxide Emissions (000)
Run Exh                             0         0         0         0         0         0         0    452.78
Idle Exh                            0         0         0         0         0         0         0      2.84
Start Ex                            0         0         0         0         0         0         0     12.68
                             -------   -------   -------   -------   -------   -------   -------   -------
Total Ex                            0         0         0         0         0         0         0     468.3
PM2.5 Emissions
Run Exh                             0         0         0         0         0         0         0     32.75
Idle Exh                            0         0         0         0         0         0         0      0.54
Start Ex                            0         0         0         0         0         0         0      1.33
                             -------   -------   -------   -------   -------   -------   -------   -------
Total Ex                            0         0         0         0         0         0         0     34.61

TireWear                            0         0         0         0         0         0         0      2.18
BrakeWr                             0         0         0         0         0         0         0      5.33
                             -------   -------   -------   -------   -------   -------   -------   -------
Total                               0         0         0         0         0         0         0     42.12
Lead                                0         0         0         0         0         0         0         0
SOx                                 0         0         0         0         0         0         0      4.54
Fuel Consumption (000 gallons)
Gasoline                            0         0         0         0         0         0         0  39464.84
Diesel                              0         0         0         0         0         0         0   7893.43
```

```
Title    : Hidden Hills Onroad PM10 - Statewide
Version  : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/06/13 05:37:40
Scen Year: 2013 -- All model years in the range 1969 to 2013 selected
Season   : Annual
Area     : Statewide totals Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day
*****************************************************************************************************************************************************************************************
                               LDA-NCAT    LDA-CAT    LDA-DSL    LDA-TOT  LDT1-NCAT   LDT1-CAT   LDT1-DSL   LDT1-TOT  LDT2-NCAT   LDT2-CAT   LDT2-DSL   LDT2-TOT   MDV-NCAT    MDV-CAT    MDV-DSL
Vehicles                          71588   14148500      28949   14249000      45562    2945190     129337    3120090      26018    5921690      11298    5959010          0          0          0
VMT/1000                           1102     479642        633     481376        861     103331       3727     107919        504     213994        303     214801          0          0          0
Trips                            278082   88774300     152701   89205100     178498   18227800     775381   19181700     102162   37130000      64389   37296600          0          0          0
Total Organic Gas Emissions
Run Exh                            8.16      32.23       0.12      40.51       6.44      10.58       0.34      17.36       3.82      20.71       0.04      24.56          0          0          0
Idle Exh                              0          0          0          0          0          0          0          0          0          0          0          0          0          0          0
Start Ex                           1.73      35.57          0       37.3       1.11       9.41          0      10.52       0.63      19.02          0      19.65          0          0          0
                                -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------
Total Ex                            9.9      67.79       0.12      77.81       7.55      19.99       0.34      27.88       4.45      39.73       0.04      44.22          0          0          0

Diurnal                            0.47       9.37          0       9.84       0.29       2.69          0       2.98       0.17       4.17          0       4.34          0          0          0
Hot Soak                           0.93      16.23          0      17.16       0.61       4.18          0       4.79       0.35       7.01          0       7.36          0          0          0
Running                            5.14      38.95          0      44.09       1.73      18.63          0      20.36       0.98      31.71          0      32.68          0          0          0
Resting                             0.3       5.95          0       6.25       0.19       1.72          0       1.91       0.11       2.73          0       2.85          0          0          0
                                -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------
Total                             16.73      138.3       0.12     155.15      10.37      47.21       0.34      57.93       6.05      85.35       0.04      91.45          0          0          0
Carbon Monoxide Emissions
Run Exh                           92.05     866.39       0.52     958.97      71.22     311.78       2.36     385.36      41.72      573.4       0.23     615.35          0          0          0
Idle Exh                              0          0          0          0          0          0          0          0          0          0          0          0          0          0          0
Start Ex                           9.13     409.72          0     418.85       5.96     123.38          0     129.34       3.39      232.8          0     236.19          0          0          0
                                -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------
Total Ex                         101.18    1276.11       0.52    1377.82      77.18     435.16       2.36      514.7      45.11     806.19       0.23     851.53          0          0          0
Oxides of Nitrogen Emissions
Run Exh                             5.4      80.39       1.02      86.81       4.16      28.84        6.1       39.1       2.41      74.76       0.49      77.66          0          0          0
Idle Exh                              0          0          0          0          0          0          0          0          0          0          0          0          0          0          0
Start Ex                           0.43      26.69          0      27.12       0.27       6.91          0       7.18       0.16      21.37          0      21.52          0          0          0
                                -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------
Total Ex                           5.83     107.08       1.02     113.93       4.43      35.75        6.1      46.29       2.57      96.13       0.49      99.18          0          0          0
Carbon Dioxide Emissions (000)
Run Exh                            0.63     200.69       0.25     201.57       0.48      53.16       1.42      55.06       0.29     112.13       0.12     112.53          0          0          0
Idle Exh                              0          0          0          0          0          0          0          0          0          0          0          0          0          0          0
Start Ex                           0.06       7.04          0        7.1       0.04       1.81          0       1.84       0.02       3.69          0       3.71          0          0          0
                                -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------
Total Ex                           0.69     207.73       0.25     208.66       0.52      54.96       1.42      56.91       0.31     115.82       0.12     116.24          0          0          0
PM10 Emissions
Run Exh                            0.04        6.1       0.08       6.22       0.03       1.58       0.19       1.81       0.02        6.6       0.02       6.64          0          0          0
Idle Exh                              0          0          0          0          0          0          0          0          0          0          0          0          0          0          0
Start Ex                              0       0.63          0       0.63          0       0.16          0       0.17          0       0.63          0       0.63          0          0          0
                                -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------
Total Ex                           0.04       6.73       0.08       6.85       0.03       1.75       0.19       1.97       0.02       7.23       0.02       7.27          0          0          0

TireWear                           0.01       4.23       0.01       4.25       0.01       0.91       0.03       0.95          0       1.89          0       1.89          0          0          0
BrakeWr                            0.02       6.63       0.01       6.66       0.01       1.43       0.05       1.49       0.01       2.96          0       2.97          0          0          0
                                -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------    -------
Total                              0.07      17.59       0.09      17.75       0.05       4.09       0.28       4.42       0.03      12.08       0.03      12.14          0          0          0
Lead                                  0          0          0          0          0          0          0          0          0          0          0          0          0          0          0
SOx                                0.01       2.01          0       2.03       0.01       0.53       0.01       0.55          0       1.12          0       1.13          0          0          0
Fuel Consumption (000 gallons)
Gasoline                           89.9   21491.62          0   21581.53       68.1    5702.74          0    5770.84      40.19   11998.26          0   12038.46          0          0          0
Diesel                                0          0      22.44      22.44          0          0     128.21     128.21          0          0      10.52      10.52          0          0          0
```

Title   : Hidden Hills Onroad PM10 - Sta
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/06/13 05:37:40
Scen Year: 2013 -- All model years in th
Season   : Annual
Area   : Statewide totals Average
I/M Stat : Enhanced Interim (2005) -- Us
Emissions: Tons Per Day
****

	MDV-TOT	LHDT1-NCA	LHDT1-CAT	LHDT1-DSL	LHDT1-TOT	LHDT2-NCA	LHDT2-CAT	LHDT2-DSL	LHDT2-TOT	MHDT-NCA	MHDT-CAT	MHDT-DSL	MHDT-TOT	HHDT-NCA	HHDT-CAT
Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	841	8598
VMT/1000	0	0	0	0	0	0	0	0	0	0	0	0	0	11	810
Trips	0	0	0	0	0	0	0	0	0	0	0	0	0	38399	392653
Total Organic Gas Emissions															
Run Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0.19	2.38
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0.82	1.87
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	1.01	4.26
Diurnal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hot Soak	0	0	0	0	0	0	0	0	0	0	0	0	0	0.02	0.02
Running	0	0	0	0	0	0	0	0	0	0	0	0	0	0.25	0.29
Resting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1.28	4.57
Carbon Monoxide Emissions															
Run Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	6.92	37.83
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	11.94	27.31
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	18.86	65.14
Oxides of Nitrogen Emissions															
Run Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0.26	9.24
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0.18	3.31
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0.44	12.55
Carbon Dioxide Emissions (000)															
Run Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.54
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.02
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0.02	0.56
PM10 Emissions															
Run Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.02
TireWear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
BrakeWr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.03
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
Fuel Consumption (000 gallons)															
Gasoline	0	0	0	0	0	0	0	0	0	0	0	0	0	4.94	69.07
Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Title   : Hidden Hills Onroad PM10 - Sta
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/06/13 05:37:40
Scen Year: 2013 -- All model years in th
Season   : Annual
Area   : Statewide totals Average
I/M Stat : Enhanced Interim (2005) -- Us
Emissions: Tons Per Day
****

	HHDT-DSL	HHDT-TOT	OBUS-NCA	OBUS-CAT	OBUS-DSL	OBUS-TOT	SBUS-NCA	SBUS-CAT	SBUS-DSL	SBUS-TOT	UB-NCAT	UB-CAT	UB-DSL	UB-TOT	MH-NCAT
Vehicles	232401	241840	0	0	0	0	0	0	0	0	0	0	0	0	0
VMT/1000	41224	42044	0	0	0	0	0	0	0	0	0	0	0	0	0
Trips	1176070	1607120	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Organic Gas Emissions															
Run Exh	42.95	45.53	0	0	0	0	0	0	0	0	0	0	0	0	0
Idle Exh	5.39	5.39	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	2.69	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	48.34	53.61	0	0	0	0	0	0	0	0	0	0	0	0	0
Diurnal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hot Soak	0	0.04	0	0	0	0	0	0	0	0	0	0	0	0	0
Running	0	0.54	0	0	0	0	0	0	0	0	0	0	0	0	0
Resting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total	48.34	54.19	0	0	0	0	0	0	0	0	0	0	0	0	0
Carbon Monoxide Emissions															
Run Exh	152.92	197.68	0	0	0	0	0	0	0	0	0	0	0	0	0
Idle Exh	20.49	20.49	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	39.25	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	173.41	257.41	0	0	0	0	0	0	0	0	0	0	0	0	0
Oxides of Nitrogen Emissions															
Run Exh	487.03	496.53	0	0	0	0	0	0	0	0	0	0	0	0	0
Idle Exh	49.37	49.37	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	3.49	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	536.4	549.39	0	0	0	0	0	0	0	0	0	0	0	0	0
Carbon Dioxide Emissions (000)															
Run Exh	83.07	83.62	0	0	0	0	0	0	0	0	0	0	0	0	0
Idle Exh	2.84	2.84	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	85.91	86.49	0	0	0	0	0	0	0	0	0	0	0	0	0
PM10 Emissions															
Run Exh	20.81	20.82	0	0	0	0	0	0	0	0	0	0	0	0	0
Idle Exh	0.58	0.58	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total Ex	21.39	21.41	0	0	0	0	0	0	0	0	0	0	0	0	0
TireWear	1.64	1.65	0	0	0	0	0	0	0	0	0	0	0	0	0
BrakeWr	1.28	1.31	0	0	0	0	0	0	0	0	0	0	0	0	0
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Total	24.31	24.36	0	0	0	0	0	0	0	0	0	0	0	0	0
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0.82	0.83	0	0	0	0	0	0	0	0	0	0	0	0	0
Fuel Consumption (000 gallons)															
Gasoline	0	74.02	0	0	0	0	0	0	0	0	0	0	0	0	0
Diesel	7732.27	7732.27	0	0	0	0	0	0	0	0	0	0	0	0	0

```
Title    : Hidden Hills Onroad PM10 - Sta
Version  : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/06/13 05:37:40
Scen Year: 2013 -- All model years in th
Season   : Annual
Area     : Statewide totals Average
I/M Stat : Enhanced Interim (2005) -- Us
Emissions: Tons Per Day
*********************************************
                                MH-CAT     MH-DSL     MH-TOT     MCY-NCAT   MCY-CAT    MCY-DSL    MCY-TOT    ALL-TOT
Vehicles                                 0          0          0          0          0          0          0   23570000
VMT/1000                                 0          0          0          0          0          0          0     846140
Trips                                    0          0          0          0          0          0          0  147290000
Total Organic Gas Emissions
Run Exh                                  0          0          0          0          0          0          0     127.96
Idle Exh                                 0          0          0          0          0          0          0       5.39
Start Ex                                 0          0          0          0          0          0          0      70.17
                                -------    -------    -------    -------    -------    -------    -------    -------
Total Ex                                 0          0          0          0          0          0          0     203.52

Diurnal                                  0          0          0          0          0          0          0      17.17
Hot Soak                                 0          0          0          0          0          0          0      29.34
Running                                  0          0          0          0          0          0          0      97.68
Resting                                  0          0          0          0          0          0          0      11.01
                                -------    -------    -------    -------    -------    -------    -------    -------
Total                                    0          0          0          0          0          0          0     358.71
Carbon Monoxide Emissions
Run Exh                                  0          0          0          0          0          0          0    2157.35
Idle Exh                                 0          0          0          0          0          0          0      20.49
Start Ex                                 0          0          0          0          0          0          0     823.63
                                -------    -------    -------    -------    -------    -------    -------    -------
Total Ex                                 0          0          0          0          0          0          0    3001.46
Oxides of Nitrogen Emissions
Run Exh                                  0          0          0          0          0          0          0      700.1
Idle Exh                                 0          0          0          0          0          0          0      49.37
Start Ex                                 0          0          0          0          0          0          0      59.32
                                -------    -------    -------    -------    -------    -------    -------    -------
Total Ex                                 0          0          0          0          0          0          0     808.78
Carbon Dioxide Emissions (000)
Run Exh                                  0          0          0          0          0          0          0     452.78
Idle Exh                                 0          0          0          0          0          0          0       2.84
Start Ex                                 0          0          0          0          0          0          0      12.68
                                -------    -------    -------    -------    -------    -------    -------    -------
Total Ex                                 0          0          0          0          0          0          0      468.3
PM10 Emissions
Run Exh                                  0          0          0          0          0          0          0      35.49
Idle Exh                                 0          0          0          0          0          0          0       0.58
Start Ex                                 0          0          0          0          0          0          0       1.43
                                -------    -------    -------    -------    -------    -------    -------    -------
Total Ex                                 0          0          0          0          0          0          0       37.5

TireWear                                 0          0          0          0          0          0          0       8.74
BrakeWr                                  0          0          0          0          0          0          0      12.43
                                -------    -------    -------    -------    -------    -------    -------    -------
Total                                    0          0          0          0          0          0          0      58.67
Lead                                     0          0          0          0          0          0          0          0
SOx                                      0          0          0          0          0          0          0       4.54
Fuel Consumption (000 gallons)
Gasoline                                 0          0          0          0          0          0          0   39464.84
Diesel                                   0          0          0          0          0          0          0    7893.43
```

Hidden Hills On-Road Truck Emissions

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA--DeliveryTruck Emissions

Delivery Truck Peak Daily Emissions														
Max Number of Deliveries Per Day	Average Round Trip Haul Distance (miles)	Vehicle Miles Traveled Per Day	Emission Factors (lbs/vmt)						Daily Emissions (lbs/day)					
			NOx	CO	VOC	SOx	PM10	PM2.5	NOx	CO	VOC	SOx	PM10	PM2.5
384	100.0	38,444	0.0312	0.0144	0.0029	0.0000	0.0012	0.0010	1198.41	554.11	111.68	1.52	47.25	37.80
Idle Exhaust							0.0003	(g/idle-hr)					0.13	

Delivery Truck Peak Annual Emissions														
Rolling 12-Mo. Peak No. of Deliveries Per Year	Average Round Trip Haul Distance (miles)	Vehicle Miles Traveled Per Year	Emission Factors (lbs/vmt)						Annual Emissions (tons/yr)					
			NOx	CO	VOC	SOx	PM10	PM2.5	NOx	CO	VOC	SOx	PM10	PM2.5
6,151	100.0	615,100	0.0312	0.0144	0.0029	0.0000	0.0012	0.0010	9.59	4.43	0.89	0.01	0.38	0.30
Idle Exhaust							0.0003	(g/idle-hr)					0.001	

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA--Worker Vehicle Emissions

Worker Travel Daily Emissions (Maximum)

Max Number of Workers Per Day	Average Employee Round Trips Per Day	Number of Round Trips Per Day	Average Round Trip Distance (Miles)	Vehicle Miles Traveled Per Day (Miles)	Emission Factors (lbs/vmt)						Daily Emissions (lbs/day)					
					NOx	CO	VOC	SOx	PM10	PM2.5	NOx	CO	VOC	SOx	PM10	PM2.5
1033	0.925	956	100.0	95,553	0.0017	0.0233	0.0025	0.0000	0.0001	0.0001	159.39	2223.94	234.22	0.00	8.15	5.10

Worker Travel Peak Annual Emissions

Peak of Rolling 12-Mo. Average No. of Workers Per Day	Average Employee Round Trips Per Day	Number of Round Trips Per Day	Average Round Trip Distance (Miles)	Days per Year	Vehicle Miles Traveled Per Year	Emission Factors (lbs/vmt)						Annual Emissions (tons/yr)					
						NOx	CO	VOC	SOx	PM10	PM2.5	NOx	CO	VOC	SOx	PM10	PM2.5
961	0.925	889	100.0	288	25,592,160	0.0017	0.0233	0.0025	0.0000	0.0001	0.0001	21.35	297.82	31.37	0.00	1.09	0.68

Hidden Hills Construction Equipment Schedule

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

Year						2013											2014												2015										
Calendar Month						Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug			
Project Month						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
Equipment	HP	Usage Factor	Load Factor	Daily Operation (hrs/day)																																	Totals	Total HP-hr During Peak 12-months	Total VMT During Peak 12 Months
Solar Field Assembly and Installation																																							
ISO Carrier	290	80%	57%	10	hr/day	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	36	507,802	
Forklift, 10,000 lb (Propane)	90	80%	30%	20	hr/day	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	36	165,888	
Air Compressor, 300 cfm	140	80%	48%	20	hr/day	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	36	412,877	
Grader	175	80%	61%	10	hr/day	0	0	0	0	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0	72	655,872	
Tractor	75	80%	55%	10	hr/day	0	0	0	0	0	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	0	0	0	0	0	0	0	0	216	760,320	
Pylon Insertion Rigs	670	80%	62%	10	hr/day	0	0	0	0	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0	72	2,552,218	
Solar Field Roads Clearing, Grubbing, and Grading																																							
Grader	215	80%	61%	10	hr/day	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	36	402,893	
Site Road Work																																							
Grader	215	80%	61%	10	hr/day	0	0	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	
Scraper	330	80%	72%	10	hr/day	0	0	4	4	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	
Paver	220	80%	62%	8	hr/day	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	
Concrete Batch Plant																																							
Loader	270	80%	55%	8	hr/day	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	142,560	
Transmix Trucks	250	N/A	ONROAD	5	hr/day	0	0	0	0	20	20	20	20	20	20	5	5	5	5	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150		500
Tower and Boiler Erection																																							
Strand Jack System	670	80%	62%	5	hr/day	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	132,928	
Crawler Crane	330	80%	43%	10	hr/day	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	
Rough Terrain Picker, 120 ton	300	80%	60%	10	hr/day	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	230,400	
Rough Terrain Picker, 50 ton	190	80%	60%	10	hr/day	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	72,960	
Forklift, 10,000 lb	90	80%	30%	8	hr/day	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	25,920	
Compressor, 300 cfm	140	80%	48%	10	hr/day	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	86,016	
Man Lift	75	80%	46%	11	hr/day	0	0	0	0	0	0	0	0	6	6	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	29,808	
Truck, Semi	250	NA	ONROAD	5	hr/day	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12		1,200
ACC Erection																																							
Crawler Crane	670	80%	43%	10	hr/day	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	8	295,014	
Forklft, 50,000 lb	230	80%	30%	8	hr/day	0	0	0	0	0	0	0	0		0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	12	72,864	
Forklift, 10,000 lb	90	80%	30%	8	hr/day	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	12	28,512	
Man Lift, 40 ft	50	80%	46%	10	hr/day	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	20	58,880	
Man Lift, 85 ft	75	80%	46%	10	hr/day	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	20	88,320	
Man Lift, 60 ft	50	80%	46%	10	hr/day	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	16	47,104	
Truck, Semi	250	80%	57%	5	hr/day	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	10	54,720	
Rough Terrain Picker	190	80%	60%	10	hr/day	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	0	0	0	0	0	0	16	175,104	
Air Compressor, 300 cfm	140	80%	48%	10	hr/day	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	0	0	0	0	20	103,219	
Power Block Erection																																							
Crawler Crane	670	80%	43%	10	hr/day	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	6	147,507	
Rough Terrain Crane, 65 Ton	250	80%	43%	10	hr/day	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	24	165,120	
Rough Terrain Crane, 35 Ton	160	80%	43%	10	hr/day	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	48	211,354	
Welder, 250 amp	20	80%	45%	10	hr/day	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	0	0	0	72	41,472	
Air Compressor, 125 cfm	60	80%	48%	10	hr/day	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	20	44,237	
Man Lift, 60 ft	50	80%	46%	9	hr/day	0	0	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0	80	123,648	
Man Lift, 85 ft	75	80%	46%	9	hr/day	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	32	61,824	
Man Lift, 40 ft	50	80%	46%	9	hr/day	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	24	61,824	
Forklift, 10,000 lb	90	80%	30%	8	hr/day	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	44	62,208	
Rough Terrain Crane, 65 Ton	250	80%	43%	10	hr/day	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	16	110,080	
Miscellaneous																																							
Water Truck, 5,000 gal	250	NA	ONROAD	10	hr/day	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	0	0	0	72		17,280
Pickup Trucks (Gasoline)	250	NA	ONROAD	8	hr/day	0	0	2	2	2	2	2	2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	2	2	2	2	0	128		25,920
AWD Gators (Gasoline)	25	100%	62%	8	hr/day	0	0	0	0	0	0	0	0	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	0	0	0	0	0	216	267,840	

Hidden Hills Construction Equipment Emission Factors

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

		Tier (Nonroad) Avg mph (Onroad)	**Base Emission Factors g/bhp (1)**						**Transient Adjustment Factor (2)**							**Adjustment (3)**	**Adjusted Emission Factors (g/bhp - Nonroad, lb/vmt Onroad)**					
Equipment	HP		BSFC lb/hp-hr	NOx	CO	VOC	SOx	PM10	Adj. Type	BSFC	NOx	CO	VOC	SOx	PM10	PM10 Fuel S	BSFC	NOx	CO	VOC	SOx	PM10
Solar Field Assembly and Installatior																						
ISO Carrier	290	3	0.367	2.500	0.748	0.184	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.748	0.184	0.005	0.064
Forklift, 10,000 lb (Propane)	90	3	0.408	3.000	2.366	0.184	0.006	0.200	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
Air Compressor, 300 cfm	140	3	0.367	2.500	0.867	0.184	0.005	0.220	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.867	0.184	0.005	0.134
Grader	175	3	0.367	2.500	0.867	0.184	0.005	0.220	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.326	0.193	0.005	0.237
Tractor	75	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Pylon Insertion Rigs	670	3	0.367	2.500	1.327	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	1.327	0.167	0.005	0.064
Solar Field Roads Clearing, Grubbing, and Grading																						
Grader	215	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Site Road Work																						
Grader	215	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Scraper	330	3	0.367	2.500	0.843	0.167	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.289	0.175	0.005	0.134
Paver	220	3	0.367	2.500	0.748	0.184	0.005	0.150	HI LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Concrete Batch Plant																						
Loader	270	3	0.367	2.500	0.843	0.167	0.005	0.150	Lo LF	1.18	1.21	2.57	2.29	1.18	2.37	-0.1013	0.433	3.025	2.165	0.382	0.006	0.254
Transmix Trucks	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Tower and Boiler Erection																						
Strand Jack System	670	3	0.367	2.500	1.327	0.167	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	2.031	0.175	0.005	0.134
Crawler Crane	330	3	0.367	2.500	0.843	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.843	0.167	0.005	0.064
Rough Terrain Picker, 120 ton	300	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Rough Terrain Picker, 50 ton	190	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Forklift, 10,000 lb	90	3	0.408	3.000	2.366	0.184	0.006	0.200	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
Compressor, 300 cfm	140	3	0.367	2.500	0.867	0.184	0.005	0.220	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.867	0.184	0.005	0.134
Man Lift	75	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Truck, Semi	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
ACC Erection																						
Crawler Crane	670	3	0.367	2.500	1.327	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	1.327	0.167	0.005	0.064
Forklft, 50,000 lb	230	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Forklift, 10,000 lb	90	3	0.408	3.000	2.366	0.184	0.006	0.200	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
Man Lift, 40 ft	50	4	0.408	4.728	1.532	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.105
Man Lift, 85 ft	75	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Man Lift, 60 ft	50	4	0.408	4.728	1.532	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.105
Truck, Semi	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Rough Terrain Picker	190	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Compressor, 300 cfm	140	3	0.367	2.500	0.867	0.184	0.005	0.220	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.867	0.184	0.005	0.134
Power Block Erection																						
Crawler Crane	670	3	0.367	2.500	1.327	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	1.327	0.167	0.005	0.064
Rough Terrain Crane, 65 Ton	250	3	0.367	2.500	0.748	0.184	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.748	0.184	0.005	0.064
Rough Terrain Crane, 35 Ton	160	3	0.367	2.500	0.867	0.184	0.005	0.220	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.867	0.184	0.005	0.134
Welder, 250 amp	20	4	0.408	4.440	2.161	0.438	0.006	0.280	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.440	2.161	0.438	0.006	0.185
Compressor, 125 cfm	60	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Man Lift, 60 ft	50	4	0.408	4.728	1.532	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.105
Man Lift, 85 ft	75	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Man Lift, 40 ft	50	4	0.408	4.728	1.532	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.105
Forklift, 10,000 lb	90	3	0.408	3.000	2.366	0.184	0.006	0.200	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
Rough Terrain Crane, 65 Ton	250	3	0.367	2.500	0.748	0.184	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.748	0.184	0.005	0.064
Miscellaneous																						
Water Truck, 5,000 gal	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Pickup Trucks (Gasoline)	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.67E-03	2.33E-02	2.45E-03	0.00E+00	8.53E-05
AWD Gators (Gasoline)	25	4	0.408	4.440	2.161	0.438	0.006	0.280	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.440	2.161	0.438	0.006	0.185

Hidden Hills Construction Equipment Emissions

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

	Daily NOx Emissions (lbs/day)												
	2013												
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Equipment	1	2	3	4	5	6	7	8	9	10	11	12	13
Solar Field Assembly and Installatior													
ISO Carrier	0.0	0.0	0.0	0.0	0.0	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6
Forklift, 10,000 lb (Propane)	0.0	0.0	0.0	0.0	0.0	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9
Grader	0.0	0.0	0.0	0.0	0.0	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
Tractor	0.0	0.0	0.0	0.0	0.0	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2
Pylon Insertion Rigs	0.0	0.0	0.0	0.0	0.0	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3
Solar Field Roads Clearing, Grubbing, and Grading													
Grader	0.0	0.0	0.0	0.0	0.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Site Road Work													
Grader	0.0	0.0	12.0	12.0	12.0	12.0	12.0	12.0	0.0	0.0	0.0	0.0	0.0
Scraper	0.0	0.0	43.6	43.6	43.6	43.6	43.6	43.6	0.0	0.0	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	4.7	0.0	0.0	0.0	0.0
Concrete Batch Plant													
Loader	0.0	0.0	0.0	0.0	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9
Transmix Trucks	0.0	0.0	0.0	0.0	31.2	31.2	31.2	31.2	31.2	31.2	7.8	7.8	7.8
Tower and Boiler Erection													
Strand Jack System	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.5	9.5	9.5	9.5	9.5
Crawler Crane	0.0	0.0	0.0	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	0.0	0.0
Rough Terrain Picker, 120 tor	0.0	0.0	0.0	0.0	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5
Rough Terrain Picker, 50 tor	0.0	0.0	0.0	0.0	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Compressor, 300 cfm	0.0	0.0	0.0	0.0	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Man Lift	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.3	12.3	12.3	12.3	0.0
Truck, Semi	0.0	0.0	0.0	0.0	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
ACC Erection													
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.7	12.7
Forklft, 50,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	2.4	2.4
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7
Man Lift, 60 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Power Block Erection													
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Rough Terrain Crane, 35 Ton	0.0	0.0	0.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Welder, 250 amp	0.0	0.0	0.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Air Compressor, 125 cfm	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Man Lift, 60 ft	0.0	0.0	0.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
Man Lift, 85 ft	0.0	0.0	0.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	3.4
Forklift, 10,000 lb	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Miscellaneous	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Truck, 5,000 gal	0.0	0.0	0.0	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Pickup Trucks (Gasoline)	0.0	0.0	4.7	4.7	4.7	4.7	4.7	4.7	14.0	14.0	14.0	14.0	14.0
AWD Gators (Gasoline)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.7	13.7	13.7	13.7	13.7
Total =	2.23	2.23	62.51	107.21	181.72	345.15	345.15	349.84	339.09	334.40	314.50	324.31	319.47
Monthly Emissions (lbs/month) =	35.66	35.66	1,000.21	1,715.42	2,907.51	5,522.43	5,522.43	5,597.49	5,425.38	5,350.33	5,032.04	5,188.88	5,111.52
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =													
Annual Emissions - Max 12-Month Rolling Total (tons/year) =													

Hidden Hills Construction Equipment Emissions

Hidden Hills Solar Electric Generating System (Total Both Plant

	2014												
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Equipment	14	15	16	17	18	19	20	21	22	23	24	25	26
Solar Field Assembly and Installatior													
ISO Carrier	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	0.0	0.0	0.0
Forklift, 10,000 lb (Propane	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	0.0	0.0	0.0
Air Compressor, 300 cfm	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	0.0	0.0	0.0
Grader	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	0.0	0.0	0.0
Tractor	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	0.0	0.0	0.0
Pylon Insertion Rigs	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	0.0	0.0	0.0
Solar Field Roads Clearing, Grubbing, and Grading													
Grader	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	0.0	0.0	0.0
Site Road Work													
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant													
Loader	11.9	11.9	11.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transmix Trucks	7.8	7.8	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Boiler Erectior													
Strand Jack System	9.5	9.5	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 120 tor	16.5	16.5	16.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 50 tor	5.2	5.2	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	2.2	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compressor, 300 cfm	5.9	5.9	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	1.6	1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ACC Erection													
Crawler Crane	12.7	12.7	12.7	12.7	12.7	12.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.0	0.0	0.0	0.0
Man Lift, 40 ft	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	0.0	0.0	0.0	0.0
Man Lift, 85 ft	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	0.0	0.0	0.0	0.0
Man Lift, 60 ft	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker	0.0	0.0	0.0	0.0	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	0.0
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Power Block Erection													
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	12.7	12.7	12.7	12.7	12.7	12.7	0.0
Rough Terrain Crane, 65 Ton	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Rough Terrain Crane, 35 Ton	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Welder, 250 amp	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Air Compressor, 125 cfm	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0.0	0.0	0.0
Man Lift, 60 ft	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	0.0	0.0	0.0
Man Lift, 85 ft	3.2	3.2	3.2	3.2	3.2	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	0.0	0.0	0.0
Forklift, 10,000 lb	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0
Rough Terrain Crane, 65 Ton	4.7	4.7	4.7	4.7	4.7	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Truck, 5,000 gal	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Pickup Trucks (Gasoline	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
AWD Gators (Gasoline)	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7
Total =	323.31	323.31	323.31	262.66	279.08	279.08	271.14	271.14	267.31	256.33	81.31	79.08	55.92
Monthly Emissions (lbs/month) =	5,172.89	5,172.89	5,172.89	4,202.49	4,465.22	4,465.22	4,338.27	4,338.27	4,276.90	4,101.32	1,300.91	1,265.25	894.73
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =													
Annual Emissions - Max 12-Month Rolling Total (tons/year) =													

Hidden Hills Construction Equipment Emissions

Hidden Hills Solar Electric Generating System (Total Both Plant

	2015				
	Apr	May	Jun	Jul	Aug
Equipment	27	28	29	30	31
Solar Field Assembly and Installatior					
ISO Carrier	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb (Propane)	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0
Grader	0.0	0.0	0.0	0.0	0.0
Tractor	0.0	0.0	0.0	0.0	0.0
Pylon Insertion Rigs	0.0	0.0	0.0	0.0	0.0
Solar Field Roads Clearing, Grubbing, and Grading					
Grader	0.0	0.0	0.0	0.0	0.0
Site Road Work					
Grader	0.0	0.0	0.0	0.0	0.0
Scraper	0.0	0.0	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant					
Loader	0.0	0.0	0.0	0.0	0.0
Transmix Trucks	0.0	0.0	0.0	0.0	0.0
Tower and Boiler Erection					
Strand Jack System	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 120 tor	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 50 tor	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0
Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0
Man Lift	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0
ACC Erection					
Crawler Crane	0.0	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	5.9	0.0	0.0	0.0	0.0
Power Block Erection					
Crawler Crane	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	4.7	0.0	0.0	0.0	0.0
Rough Terrain Crane, 35 Ton	6.1	0.0	0.0	0.0	0.0
Welder, 250 amp	2.1	0.0	0.0	0.0	0.0
Air Compressor, 125 cfm	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.0	0.0	0.0	0.0	0.0
Water Truck, 5,000 gal	9.4	0.0	0.0	0.0	0.0
Pickup Trucks (Gasoline)	4.7	4.7	4.7	4.7	0.0
AWD Gators (Gasoline)	0.0	0.0	0.0	0.0	0.0
Total =	32.91	4.68	4.68	4.68	0.00
Monthly Emissions (lbs/month) =	526.63	74.82	74.82	74.82	0.00
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =					62,472
Annual Emissions - Max 12-Month Rolling Total (tons/year) =					31.2

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

	Daily CO Emissions (lbs/day)										
	2013										
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Equipment	1	2	3	4	5	6	7	8	9	10	11
Solar Field Assembly and Installation											
ISO Carrier	0.0	0.0	0.0	0.0	0.0	4.4	4.4	4.4	4.4	4.4	4.4
Forklift, 10,000 lb (Propane)	0.0	0.0	0.0	0.0	0.0	6.9	6.9	6.9	6.9	6.9	6.9
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	4.1	4.1	4.1	4.1	4.1	4.1
Grader	0.0	0.0	0.0	0.0	0.0	10.0	10.0	10.0	10.0	10.0	10.0
Tractor	0.0	0.0	0.0	0.0	0.0	20.7	20.7	20.7	20.7	20.7	20.7
Pylon Insertion Rigs	0.0	0.0	0.0	0.0	0.0	38.9	38.9	38.9	38.9	38.9	38.9
Solar Field Roads Clearing, Grubbing, and Grading											
Grader	0.0	0.0	0.0	0.0	0.0	5.3	5.3	5.3	5.3	5.3	5.3
Site Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grader	0.0	0.0	5.3	5.3	5.3	5.3	5.3	5.3	0.0	0.0	0.0
Scraper	0.0	0.0	21.6	21.6	21.6	21.6	21.6	21.6	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	2.1	0.0	0.0
Concrete Batch Plant											
Loader	0.0	0.0	0.0	0.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5
Transmix Trucks	0.0	0.0	0.0	0.0	14.4	14.4	14.4	14.4	14.4	14.4	3.6
Tower and Boiler Erection											
Strand Jack System	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	7.4	7.4
Crawler Crane	0.0	0.0	0.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Rough Terrain Picker, 120 ton	0.0	0.0	0.0	0.0	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Rough Terrain Picker, 50 ton	0.0	0.0	0.0	0.0	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Compressor, 300 cfm	0.0	0.0	0.0	0.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Man Lift	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.7	9.7	9.7
Truck, Semi	0.0	0.0	0.0	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7
ACC Erection											
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Power Block Erection											
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Rough Terrain Crane, 35 Ton	0.0	0.0	0.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Welder, 250 amp	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Air Compressor, 125 cfm	0.0	0.0	0.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Man Lift, 60 ft	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Man Lift, 85 ft	0.0	0.0	0.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Miscellaneous											
Water Truck, 5,000 gal	0.0	0.0	0.0	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Pickup Trucks (Gasoline)	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	6.5	6.5	6.5
AWD Gators (Gasoline)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	6.6	6.6
Total =	2.59	2.59	31.64	49.94	87.78	177.96	177.96	180.03	181.25	179.19	170.72
Monthly Emissions (lbs/month) =	41.36	41.36	506.31	799.03	1,404.49	2,847.41	2,847.41	2,880.43	2,900.05	2,867.04	2,731.46
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =											
Annual Emissions - Max 12-Month Rolling Total (tons/year) =											

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

	Daily VOC Emissions (lbs/day)										
						2013					
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Equipment	1	2	3	4	5	6	7	8	9	10	11
Solar Field Assembly and Installation											
ISO Carrier	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1
Forklift, 10,000 lb (Propane)	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9
Grader	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5
Tractor	0.0	0.0	0.0	0.0	0.0	1.6	1.6	1.6	1.6	1.6	1.6
Pylon Insertion Rigs	0.0	0.0	0.0	0.0	0.0	4.9	4.9	4.9	4.9	4.9	4.9
Solar Field Roads Clearing, Grubbing, and Grading											
Grader	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9
Site Road Work											
Grader	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0	0.0
Scraper	0.0	0.0	2.9	2.9	2.9	2.9	2.9	2.9	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0
Concrete Batch Plant											
Loader	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Transmix Trucks	0.0	0.0	0.0	0.0	2.9	2.9	2.9	2.9	2.9	2.9	0.7
Tower and Boiler Erection											
Strand Jack System	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
Crawler Crane	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Rough Terrain Picker, 120 ton	0.0	0.0	0.0	0.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Rough Terrain Picker, 50 ton	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Man Lift	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8
Truck, Semi	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ACC Erection											
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Power Block Erection											
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Rough Terrain Crane, 35 Ton	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Welder, 250 amp	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Air Compressor, 125 cfm	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Man Lift, 60 ft	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Man Lift, 85 ft	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Miscellaneous											
Water Truck, 5,000 gal	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Pickup Trucks (Gasoline)	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	1.1	1.1	1.1
AWD Gators (Gasoline)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3	1.3
Total =	0.14	0.14	4.33	7.66	14.40	25.54	25.54	25.89	25.54	25.19	23.26
Monthly Emissions (lbs/month) =	2.20	2.20	69.35	122.54	230.32	408.65	408.65	414.22	408.60	403.04	372.10
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =											
Annual Emissions - Max 12-Month Rolling Total (tons/year) =											

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

	Daily SOx Emissions (lbs/day)										
						2013					
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Equipment	1	2	3	4	5	6	7	8	9	10	11
Solar Field Assembly and Installation											
ISO Carrier	0.000	0.000	0.000	0.000	0.000	0.029	0.029	0.029	0.029	0.029	0.029
Forklift, 10,000 lb (Propane)	0.000	0.000	0.000	0.000	0.000	0.011	0.011	0.011	0.011	0.011	0.011
Air Compressor, 300 cfm	0.000	0.000	0.000	0.000	0.000	0.024	0.024	0.024	0.024	0.024	0.024
Grader	0.000	0.000	0.000	0.000	0.000	0.039	0.039	0.039	0.039	0.039	0.039
Tractor	0.000	0.000	0.000	0.000	0.000	0.048	0.048	0.048	0.048	0.048	0.048
Pylon Insertion Rigs	0.000	0.000	0.000	0.000	0.000	0.146	0.146	0.146	0.146	0.146	0.146
Solar Field Roads Clearing, Grubbing, and Grading											
Grader	0.000	0.000	0.000	0.000	0.000	0.024	0.024	0.024	0.024	0.024	0.024
Site Road Work											
Grader	0.000	0.000	0.024	0.024	0.024	0.024	0.024	0.024	0.000	0.000	0.000
Scraper	0.000	0.000	0.088	0.088	0.088	0.088	0.088	0.088	0.000	0.000	0.000
Paver	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.009	0.000	0.000
Concrete Batch Plant											
Loader	0.000	0.000	0.000	0.000	0.023	0.023	0.023	0.023	0.023	0.023	0.023
Transmix Trucks	0.000	0.000	0.000	0.000	0.039	0.039	0.039	0.039	0.039	0.039	0.010
Tower and Boiler Erection											
Strand Jack System	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.019	0.019
Crawler Crane	0.000	0.000	0.000	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012
Rough Terrain Picker, 120 ton	0.000	0.000	0.000	0.000	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Rough Terrain Picker, 50 ton	0.000	0.000	0.000	0.000	0.011	0.011	0.011	0.011	0.011	0.011	0.011
Forklift, 10,000 lb	0.000	0.000	0.000	0.000	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Compressor, 300 cfm	0.000	0.000	0.000	0.000	0.012	0.012	0.012	0.012	0.012	0.012	0.012
Man Lift	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.023	0.023
Truck, Semi	0.000	0.000	0.000	0.000	0.002	0.002	0.002	0.002	0.002	0.002	0.002
ACC Erection											
Crawler Crane	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Forklft, 50,000 lb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
Forklift, 10,000 lb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
Man Lift, 40 ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Man Lift, 85 ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Man Lift, 60 ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Truck, Semi	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rough Terrain Picker	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Air Compressor, 300 cfm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Power Block Erection											
Crawler Crane	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rough Terrain Crane, 65 Ton	0.000	0.000	0.000	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009
Rough Terrain Crane, 35 Ton	0.000	0.000	0.000	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012
Welder, 250 amp	0.000	0.000	0.000	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Air Compressor, 125 cfm	0.000	0.000	0.000	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Man Lift, 60 ft	0.000	0.000	0.000	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008
Man Lift, 85 ft	0.000	0.000	0.000	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Man Lift, 40 ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Forklift, 10,000 lb	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Rough Terrain Crane, 65 Ton	0.000	0.000	0.000	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009
Miscellaneous											
Water Truck, 5,000 gal	0.000	0.000	0.000	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012
Pickup Trucks (Gasoline)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AWD Gators (Gasoline)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.017	0.017
Total =	0.00	0.00	0.12	0.19	0.32	0.64	0.64	0.65	0.59	0.58	0.56
Monthly Emissions (lbs/month) =	0.06	0.06	1.86	3.05	5.04	10.19	10.19	10.35	9.50	9.35	8.98
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =											
Annual Emissions - Max 12-Month Rolling Total (tons/year) =											

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

	Daily PM10 Emissions (lbs/day)										
	2013										
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Equipment	1	2	3	4	5	6	7	8	9	10	11
Solar Field Assembly and Installation											
ISO Carrier	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4
Forklift, 10,000 lb (Propane)	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6
Grader	0.0	0.0	0.0	0.0	0.0	1.8	1.8	1.8	1.8	1.8	1.8
Tractor	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9
Pylon Insertion Rigs	0.0	0.0	0.0	0.0	0.0	1.9	1.9	1.9	1.9	1.9	1.9
Solar Field Roads Clearing, Grubbing, and Grading											
Grader	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6
Site Road Work											
Grader	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0
Scraper	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0
Concrete Batch Plant											
Loader	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Transmix Trucks	0.0	0.0	0.0	0.0	1.2	1.2	1.2	1.2	1.2	1.2	0.3
Tower and Boiler Erection											
Strand Jack System	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5
Crawler Crane	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Rough Terrain Picker, 120 ton	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Rough Terrain Picker, 50 ton	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Man Lift	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4
Truck, Semi	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ACC Erection											
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Power Block Erection											
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Rough Terrain Crane, 35 Ton	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Welder, 250 amp	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Air Compressor, 125 cfm	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Man Lift, 60 ft	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Man Lift, 85 ft	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Miscellaneous											
Water Truck, 5,000 gal	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Pickup Trucks (Gasoline)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AWD Gators (Gasoline)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
Total =	0.14	0.14	3.02	4.51	8.38	14.96	14.96	15.20	13.85	13.61	12.88
Monthly Emissions (lbs/month) =	2.26	2.26	48.25	72.23	134.09	239.37	239.37	243.24	221.66	217.79	206.13
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =											
Annual Emissions - Max 12-Month Rolling Total (tons/year) =											

Hidden Hills Solar Electric Generating System (Total Both Plants)

	2014											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Equipment	12	13	14	15	16	17	18	19	20	21	22	23
Solar Field Assembly and Installation												
ISO Carrier	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Forklift, 10,000 lb (Propane)	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9
Air Compressor, 300 cfm	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Grader	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Tractor	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7
Pylon Insertion Rigs	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9
Solar Field Roads Clearing, Grubbing, and Grading												
Grader	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Site Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant												
Loader	8.5	8.5	8.5	8.5	8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transmix Trucks	3.6	3.6	3.6	3.6	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Boiler Erection												
Strand Jack System	7.4	7.4	7.4	7.4	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 120 ton	7.3	7.3	7.3	7.3	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 50 ton	2.3	2.3	2.3	2.3	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	2.6	2.6	2.6	2.6	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compressor, 300 cfm	2.1	2.1	2.1	2.1	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift	9.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.7	0.7	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ACC Erection												
Crawler Crane	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Forklift, 10,000 lb	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	0.0
Man Lift, 40 ft	0.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	0.0
Man Lift, 85 ft	0.0	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	0.0
Man Lift, 60 ft	0.0	0.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker	0.0	0.0	0.0	0.0	0.0	0.0	4.6	4.6	4.6	4.6	4.6	4.6
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	2.1	2.1	2.1	2.1	2.1	2.1
Power Block Erection												
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	6.7	6.7	6.7
Rough Terrain Crane, 65 Ton	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Rough Terrain Crane, 35 Ton	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Welder, 250 amp	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Air Compressor, 125 cfm	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Man Lift, 60 ft	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Man Lift, 85 ft	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	0.0	0.0	0.0	0.0
Man Lift, 40 ft	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Forklift, 10,000 lb	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Rough Terrain Crane, 65 Ton	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	0.0	0.0	0.0	0.0
Miscellaneous												
Water Truck, 5,000 gal	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Pickup Trucks (Gasoline)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
AWD Gators (Gasoline)	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6
Total =	176.44	170.85	172.09	172.09	172.09	137.62	144.29	144.29	140.35	140.35	139.11	132.65
Monthly Emissions (lbs/month) =	2,823.03	2,733.53	2,753.42	2,753.42	2,753.42	2,201.91	2,308.65	2,308.65	2,245.68	2,245.68	2,225.79	2,122.46
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =												
Annual Emissions - Max 12-Month Rolling Total (tons/year) =												

Hidden Hills Solar Electric Generating System (Total Both Plants)

	2014											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Equipment	12	13	14	15	16	17	18	19	20	21	22	23
Solar Field Assembly and Installation												
ISO Carrier	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Forklift, 10,000 lb (Propane)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Air Compressor, 300 cfm	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Grader	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Tractor	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Pylon Insertion Rigs	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Solar Field Roads Clearing, Grubbing, and Grading												
Grader	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Site Road Work												
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant												
Loader	1.5	1.5	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transmix Trucks	0.7	0.7	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Boiler Erection												
Strand Jack System	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 120 ton	1.2	1.2	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 50 ton	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compressor, 300 cfm	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ACC Erection												
Crawler Crane	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0
Forklift, 10,000 lb	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Man Lift, 40 ft	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0
Man Lift, 85 ft	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0
Man Lift, 60 ft	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4
Power Block Erection												
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8
Rough Terrain Crane, 65 Ton	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Rough Terrain Crane, 35 Ton	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Welder, 250 amp	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Air Compressor, 125 cfm	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Man Lift, 60 ft	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Man Lift, 85 ft	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Forklift, 10,000 lb	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Rough Terrain Crane, 65 Ton	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0
Miscellaneous												
Water Truck, 5,000 gal	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Pickup Trucks (Gasoline)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
AWD Gators (Gasoline)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Total =	23.88	23.58	23.81	23.81	23.81	18.61	19.82	19.82	19.28	19.28	19.05	18.36
Monthly Emissions (lbs/month) =	382.15	377.28	380.90	380.90	380.90	297.71	317.13	317.13	308.43	308.43	304.81	293.70
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =												
Annual Emissions - Max 12-Month Rolling Total (tons/year) =												

Hidden Hills Solar Electric Generating System (Total Both Plants)

	2014											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Equipment	12	13	14	15	16	17	18	19	20	21	22	23
Solar Field Assembly and Installation												
ISO Carrier	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029
Forklift, 10,000 lb (Propane)	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011
Air Compressor, 300 cfm	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024
Grader	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039
Tractor	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048
Pylon Insertion Rigs	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146
Solar Field Roads Clearing, Grubbing, and Grading												
Grader	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024
Site Road Work												
Grader	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Scraper	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Paver	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete Batch Plant												
Loader	0.023	0.023	0.023	0.023	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Transmix Trucks	0.010	0.010	0.010	0.010	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tower and Boiler Erection												
Strand Jack System	0.019	0.019	0.019	0.019	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Crawler Crane	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rough Terrain Picker, 120 ton	0.033	0.033	0.033	0.033	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rough Terrain Picker, 50 ton	0.011	0.011	0.011	0.011	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Forklift, 10,000 lb	0.004	0.004	0.004	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Compressor, 300 cfm	0.012	0.012	0.012	0.012	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Man Lift	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Truck, Semi	0.002	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ACC Erection												
Crawler Crane	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.000	0.000	0.000	0.000
Forklft, 50,000 lb	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.000
Forklift, 10,000 lb	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.000
Man Lift, 40 ft	0.000	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.000
Man Lift, 85 ft	0.000	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.000
Man Lift, 60 ft	0.000	0.000	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.000	0.000
Truck, Semi	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rough Terrain Picker	0.000	0.000	0.000	0.000	0.000	0.000	0.021	0.021	0.021	0.021	0.021	0.021
Air Compressor, 300 cfm	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.012	0.012	0.012	0.012	0.012
Power Block Erection												
Crawler Crane	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.025	0.025	0.025
Rough Terrain Crane, 65 Ton	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009
Rough Terrain Crane, 35 Ton	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012
Welder, 250 amp	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Air Compressor, 125 cfm	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Man Lift, 60 ft	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008
Man Lift, 85 ft	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.000	0.000	0.000	0.000
Man Lift, 40 ft	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Forklift, 10,000 lb	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Rough Terrain Crane, 65 Ton	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.000	0.000	0.000	0.000
Miscellaneous												
Water Truck, 5,000 gal	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012
Pickup Trucks (Gasoline)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AWD Gators (Gasoline)	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017
Total =	0.58	0.57	0.57	0.57	0.57	0.46	0.49	0.49	0.47	0.47	0.47	0.45
Monthly Emissions (lbs/month) =	9.25	9.06	9.13	9.13	9.13	7.31	7.84	7.84	7.59	7.59	7.52	7.24
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =												
Annual Emissions - Max 12-Month Rolling Total (tons/year) =												

Hidden Hills Solar Electric Generating System (Total Both Plants)

	2014											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Equipment	12	13	14	15	16	17	18	19	20	21	22	23
Solar Field Assembly and Installation												
ISO Carrier	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Forklift, 10,000 lb (Propane)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Air Compressor, 300 cfm	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Grader	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Tractor	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Pylon Insertion Rigs	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Solar Field Roads Clearing, Grubbing, and Grading												
Grader	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Site Road Work												
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant												
Loader	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transmix Trucks	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Boiler Erection												
Strand Jack System	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 120 ton	0.8	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 50 ton	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compressor, 300 cfm	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ACC Erection												
Crawler Crane	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Forklift, 10,000 lb	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Man Lift, 40 ft	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Man Lift, 85 ft	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Man Lift, 60 ft	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3
Power Block Erection												
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3
Rough Terrain Crane, 65 Ton	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Rough Terrain Crane, 35 Ton	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Welder, 250 amp	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Air Compressor, 125 cfm	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Man Lift, 60 ft	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Man Lift, 85 ft	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Forklift, 10,000 lb	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Rough Terrain Crane, 65 Ton	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Miscellaneous												
Water Truck, 5,000 gal	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Pickup Trucks (Gasoline)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AWD Gators (Gasoline)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Total =	13.12	12.91	12.99	12.99	12.99	9.56	10.41	10.41	10.18	10.18	10.09	9.69
Monthly Emissions (lbs/month) =	209.96	206.48	207.84	207.84	207.84	152.88	166.60	166.60	162.88	162.88	161.52	155.04
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =												
Annual Emissions - Max 12-Month Rolling Total (tons/year) =												

Hidden Hills Solar Electric Generating System (Total Both Plants)

	2015							
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Equipment	24	25	26	27	28	29	30	31
Solar Field Assembly and Installation								
ISO Carrier	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb (Propane)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tractor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pylon Insertion Rigs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Solar Field Roads Clearing, Grubbing, and Grading								
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant								
Loader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transmix Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Boiler Erection								
Strand Jack System	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 120 ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 50 ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ACC Erection								
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker	4.6	4.6	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	2.1	2.1	2.1	2.1	0.0	0.0	0.0	0.0
Power Block Erection								
Crawler Crane	6.7	6.7	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	1.4	1.4	1.4	1.4	0.0	0.0	0.0	0.0
Rough Terrain Crane, 35 Ton	2.1	2.1	2.1	2.1	0.0	0.0	0.0	0.0
Welder, 250 amp	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0
Air Compressor, 125 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous								
Water Truck, 5,000 gal	4.3	4.3	4.3	4.3	0.0	0.0	0.0	0.0
Pickup Trucks (Gasoline)	6.5	6.5	6.5	2.2	2.2	2.2	2.2	0.0
AWD Gators (Gasoline)	6.6	6.6	6.6	0.0	0.0	0.0	0.0	0.0
Total =	38.01	35.42	24.08	13.11	2.16	2.16	2.16	0.00
Monthly Emissions (lbs/month) =	608.09	566.73	385.25	209.73	34.59	34.59	34.59	0.00
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =								33,093
Annual Emissions - Max 12-Month Rolling Total (tons/year) =								16.5

Hidden Hills Solar Electric Generating System (Total Both Plants)

	2015							
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Equipment	24	25	26	27	28	29	30	31
Solar Field Assembly and Installation								
ISO Carrier	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb (Propane)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tractor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pylon Insertion Rigs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Solar Field Roads Clearing, Grubbing, and Grading								
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Road Work								
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant								
Loader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transmix Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Boiler Erection								
Strand Jack System	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 120 ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 50 ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ACC Erection								
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0
Power Block Erection								
Crawler Crane	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0
Rough Terrain Crane, 35 Ton	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0
Welder, 250 amp	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0
Air Compressor, 125 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous								
Water Truck, 5,000 gal	0.9	0.9	0.9	0.9	0.0	0.0	0.0	0.0
Pickup Trucks (Gasoline)	1.1	1.1	1.1	0.4	0.4	0.4	0.4	0.0
AWD Gators (Gasoline)	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0
Total =	6.52	6.39	4.76	2.68	0.37	0.37	0.37	0.00
Monthly Emissions (lbs/month) =	104.38	102.17	76.20	42.88	5.88	5.88	5.88	0.00
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =								4,615
Annual Emissions - Max 12-Month Rolling Total (tons/year) =								2.3

Hidden Hills Solar Electric Generating System (Total Both Plants)

	2015							
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Equipment	24	25	26	27	28	29	30	31
Solar Field Assembly and Installation								
ISO Carrier	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Forklift, 10,000 lb (Propane)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Air Compressor, 300 cfm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Grader	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tractor	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pylon Insertion Rigs	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Solar Field Roads Clearing, Grubbing, and Grading								
Grader	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Site Road Work								
Grader	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Scraper	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Paver	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete Batch Plant								
Loader	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Transmix Trucks	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tower and Boiler Erection								
Strand Jack System	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Crawler Crane	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rough Terrain Picker, 120 ton	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rough Terrain Picker, 50 ton	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Forklift, 10,000 lb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Compressor, 300 cfm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Man Lift	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Truck, Semi	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ACC Erection								
Crawler Crane	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Forklft, 50,000 lb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Forklift, 10,000 lb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Man Lift, 40 ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Man Lift, 85 ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Man Lift, 60 ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Truck, Semi	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rough Terrain Picker	0.021	0.021	0.000	0.000	0.000	0.000	0.000	0.000
Air Compressor, 300 cfm	0.012	0.012	0.012	0.012	0.000	0.000	0.000	0.000
Power Block Erection								
Crawler Crane	0.025	0.025	0.000	0.000	0.000	0.000	0.000	0.000
Rough Terrain Crane, 65 Ton	0.009	0.009	0.009	0.009	0.000	0.000	0.000	0.000
Rough Terrain Crane, 35 Ton	0.012	0.012	0.012	0.012	0.000	0.000	0.000	0.000
Welder, 250 amp	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000
Air Compressor, 125 cfm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Man Lift, 60 ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Man Lift, 85 ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Man Lift, 40 ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Forklift, 10,000 lb	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rough Terrain Crane, 65 Ton	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Miscellaneous								
Water Truck, 5,000 gal	0.012	0.012	0.012	0.012	0.000	0.000	0.000	0.000
Pickup Trucks (Gasoline)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AWD Gators (Gasoline)	0.017	0.017	0.017	0.000	0.000	0.000	0.000	0.000
Total =	0.12	0.11	0.07	0.05	0.00	0.00	0.00	0.00
Monthly Emissions (lbs/month) =	1.85	1.78	1.04	0.77	0.00	0.00	0.00	0.00
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =								112
Annual Emissions - Max 12-Month Rolling Total (tons/year) =								0.1

Hidden Hills Solar Electric Generating System (Total Both Plants)

	2015							
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Equipment	24	25	26	27	28	29	30	31
Solar Field Assembly and Installation								
ISO Carrier	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb (Propane)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tractor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pylon Insertion Rigs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Solar Field Roads Clearing, Grubbing, and Grading								
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Road Work								
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant								
Loader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transmix Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Boiler Erection								
Strand Jack System	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 120 ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 50 ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ACC Erection								
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0
Power Block Erection								
Crawler Crane	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Rough Terrain Crane, 35 Ton	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0
Welder, 250 amp	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Air Compressor, 125 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous								
Water Truck, 5,000 gal	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0
Pickup Trucks (Gasoline)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AWD Gators (Gasoline)	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0
Total =	2.83	2.69	1.83	1.24	0.01	0.01	0.01	0.00
Monthly Emissions (lbs/month) =	45.35	43.09	29.27	19.78	0.20	0.20	0.20	0.00
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =								2,560
Annual Emissions - Max 12-Month Rolling Total (tons/year) =								1.3

Hidden Hills Dust Emission Process Rates

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

Equipment	Average Veh Travel Rate mph	Per Unit Daily Process Rate	Units	2013 Feb 1	Mar 2	Apr 3	May 4	Jun 5	Jul 6	Aug 7	Sep 8	Oct 9	Nov 10	Dec 11
Solar Field Assembly and Installation														
ISO Carrier	0.25	1.1	VMT/Day	0.0	0.0	0.0	0.0	0.0	2.3	2.3	2.3	2.3	2.3	2.3
Forklift, 10,000 lb (Propane)	0.25	1.2	VMT/Day	0.0	0.0	0.0	0.0	0.0	2.4	2.4	2.4	2.4	2.4	2.4
Air Compressor, 300 cfm	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grader	1.50	7.3	VMT/Day	0.0	0.0	0.0	0.0	0.0	29.3	29.3	29.3	29.3	29.3	29.3
Tractor	1.50	6.6	VMT/Day	0.0	0.0	0.0	0.0	0.0	79.2	79.2	79.2	79.2	79.2	79.2
Pylon Insertion Rigs	1.50	7.4	VMT/Day	0.0	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8
Solar Field Roads Clearing, Grubbing, and Grading														
Grader	1.50	7.3	VMT/Day	0.0	0.0	0.0	0.0	0.0	14.6	14.6	14.6	14.6	14.6	14.6
Site Road Work														
Grader	1.50	7.3	VMT/Day	0.0	0.0	14.6	14.6	14.6	14.6	14.6	14.6	0.0	0.0	0.0
Scraper	1.50	8.6	VMT/Day	0.0	0.0	34.6	34.6	34.6	34.6	34.6	34.6	0.0	0.0	0.0
Paver	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant														
Loader	0.25	0.8	VMT/Day	0.0	0.0	0.0	0.0	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Transmix Trucks	0.25	1.3	VMT/Day	0.0	0.0	0.0	0.0	25.0	25.0	25.0	25.0	25.0	25.0	6.3
Tower and Boiler Erection														
Strand Jack System	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.25	0.9	VMT/Day	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Rough Terrain Picker, 120 ton	0.25	1.2	VMT/Day	0.0	0.0	0.0	0.0	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Rough Terrain Picker, 50 ton	0.25	1.2	VMT/Day	0.0	0.0	0.0	0.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Forklift, 10,000 lb	0.25	0.5	VMT/Day	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Compressor, 300 cfm	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift	0.25	1.0	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2	6.2	6.2
Truck, Semi	3.00	15.0	VMT/Day	0.0	0.0	0.0	0.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
ACC Erection														
Crawler Crane	0.25	0.9	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.25	0.5	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Forklift, 10,000 lb	0.25	0.5	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Man Lift, 40 ft	0.25	0.9	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.25	0.9	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.25	0.9	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	3.00	6.8	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker	0.25	1.2	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Power Block Erection														
Crawler Crane	0.25	0.9	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.25	0.9	VMT/Day	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Rough Terrain Crane, 35 Ton	0.25	0.9	VMT/Day	0.0	0.0	0.0	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Welder, 250 amp	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 125 cfm	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.25	0.8	VMT/Day	0.0	0.0	0.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Man Lift, 85 ft	0.25	0.8	VMT/Day	0.0	0.0	0.0	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Man Lift, 40 ft	0.25	0.8	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.25	0.5	VMT/Day	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Rough Terrain Crane, 65 Ton	0.25	0.9		0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Miscellaneous														
Water Truck, 5,000 gal	3.00	30.0	VMT/Day	0.0	0.0	0.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0
Pickup Trucks (Gasoline)	3.00	22.5	VMT/Day	0.0	0.0	45.0	45.0	45.0	45.0	45.0	45.0	135.0	135.0	135.0
AWD Gators (Gasoline)	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Windblown Dust (active construction area)	NA	276,744	SQ FT.	0.0	0.0	276,744	276,744	276,744	276,744	276,744	276,744	276,744	276,744	276,744

Hidden Hills Dust Emission Process Rates

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

				2014											
Equipment	Average Veh Travel Rate mph	Per Unit Daily Process Rate	Units	Jan 12	Feb 13	Mar 14	Apr 15	May 16	Jun 17	Jul 18	Aug 19	Sep 20	Oct 21	Nov 22	Dec 23
Solar Field Assembly and Installation															
ISO Carrier	0.25	1.1	VMT/Day	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Forklift, 10,000 lb (Propane)	0.25	1.2	VMT/Day	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Air Compressor, 300 cfm	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grader	1.50	7.3	VMT/Day	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3
Tractor	1.50	6.6	VMT/Day	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2
Pylon Insertion Rigs	1.50	7.4	VMT/Day	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8
Solar Field Roads Clearing, Grubbing, and Grading															
Grader	1.50	7.3	VMT/Day	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6
Site Road Work															
Grader	1.50	7.3	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper	1.50	8.6	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paver	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant															
Loader	0.25	0.8	VMT/Day	1.7	1.7	1.7	1.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transmix Trucks	0.25	1.3	VMT/Day	6.3	6.3	6.3	6.3	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Boiler Erection															
Strand Jack System	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.25	0.9	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 120 ton	0.25	1.2	VMT/Day	2.4	2.4	2.4	2.4	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 50 ton	0.25	1.2	VMT/Day	1.2	1.2	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.25	0.5	VMT/Day	0.9	0.9	0.9	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compressor, 300 cfm	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift	0.25	1.0	VMT/Day	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	3.00	15.0	VMT/Day	15.0	15.0	15.0	15.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ACC Erection															
Crawler Crane	0.25	0.9	VMT/Day	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.25	0.5	VMT/Day	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Forklift, 10,000 lb	0.25	0.5	VMT/Day	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Man Lift, 40 ft	0.25	0.9	VMT/Day	0.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0.0
Man Lift, 85 ft	0.25	0.9	VMT/Day	0.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0.0
Man Lift, 60 ft	0.25	0.9	VMT/Day	0.0	0.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0.0	0.0
Truck, Semi	3.00	6.8	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	6.8	6.8	6.8	6.8	6.8	6.8
Rough Terrain Picker	0.25	1.2	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	2.4	2.4	2.4	2.4	2.4	2.4
Air Compressor, 300 cfm	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Power Block Erection															
Crawler Crane	0.25	0.9	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9
Rough Terrain Crane, 65 Ton	0.25	0.9	VMT/Day	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Rough Terrain Crane, 35 Ton	0.25	0.9	VMT/Day	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Welder, 250 amp	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 125 cfm	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.25	0.8	VMT/Day	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Man Lift, 85 ft	0.25	0.8	VMT/Day	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.25	0.8	VMT/Day	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Forklift, 10,000 lb	0.25	0.5	VMT/Day	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Rough Terrain Crane, 65 Ton	0.25	0.9		0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0	0.0	0.0
Miscellaneous															
Water Truck, 5,000 gal	3.00	30.0	VMT/Day	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0
Pickup Trucks (Gasoline)	3.00	22.5	VMT/Day	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0
AWD Gators (Gasoline)	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Windblown Dust (active construction area)	NA	276,744	SQ FT.	276,744	276,744	276,744	276,744	276,744	276,744	276,744	276,744	276,744	276,744	276,744	276,744

Hidden Hills Dust Emission Process Rates

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

Equipment	Average Veh Travel Rate mph	Per Unit Daily Process Rate	Units	2015							
				Jan 24	Feb 25	Mar 26	Apr 27	May 28	Jun 29	Jul 30	Aug 31
Solar Field Assembly and Installation											
ISO Carrier	0.25	1.1	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb (Propane)	0.25	1.2	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grader	1.50	7.3	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tractor	1.50	6.6	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pylon Insertion Rigs	1.50	7.4	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Solar Field Roads Clearing, Grubbing, and Grading											
Grader	1.50	7.3	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Road Work											
Grader	1.50	7.3	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper	1.50	8.6	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paver	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant											
Loader	0.25	0.8	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transmix Trucks	0.25	1.3	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Boiler Erection											
Strand Jack System	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.25	0.9	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 120 ton	0.25	1.2	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 50 ton	0.25	1.2	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.25	0.5	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compressor, 300 cfm	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift	0.25	1.0	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	3.00	15.0	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ACC Erection											
Crawler Crane	0.25	0.9	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.25	0.5	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.25	0.5	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.25	0.9	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.25	0.9	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.25	0.9	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	3.00	6.8	VMT/Day	6.8	6.8	6.8	6.8	0.0	0.0	0.0	0.0
Rough Terrain Picker	0.25	1.2	VMT/Day	2.4	2.4	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Power Block Erection											
Crawler Crane	0.25	0.9	VMT/Day	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.25	0.9	VMT/Day	0.9	0.9	0.9	0.9	0.0	0.0	0.0	0.0
Rough Terrain Crane, 35 Ton	0.25	0.9	VMT/Day	1.7	1.7	1.7	1.7	0.0	0.0	0.0	0.0
Welder, 250 amp	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 125 cfm	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.25	0.8	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.25	0.8	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.25	0.8	VMT/Day	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.25	0.5	VMT/Day	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.25	0.9		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous											
Water Truck, 5,000 gal	3.00	30.0	VMT/Day	90.0	90.0	90.0	90.0	0.0	0.0	0.0	0.0
Pickup Trucks (Gasoline)	3.00	22.5	VMT/Day	135.0	135.0	135.0	45.0	45.0	45.0	45.0	0.0
AWD Gators (Gasoline)	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Windblown Dust (active construction area)	NA	276,744	SQ FT.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Hidden Hills Dust Emission Factor Derivation

Unpaved Road Travel and Active Excavation Area Control - Source: Control of Open Fugitive Dust Sources,Scraping, and Grading U.S EPA, 9/88

$C = 100 - (0.8)(p)(d)(t)/(i)$

p = potential average hourly daytime
evaporation rate = 0.845 mm/hr (EPA document, Figure 3-2, summer)
evaporation rate = 0.637 mm/hr (EPA document, Figure 3-2, annual)
d = average hourly daytime traffic rate = 5.0 vehicles/hr (estimated)
t = time between watering applications = 6.00 hr/application (estimated)
i = application intensity = 1.4 L/m2 (typical level in EPA document, page 3-23)
C = average summer watering control efficiency = 85.1%
C = average annual watering control efficiency = 88.8%

Wind Erosion of Active Construction Area - Source: "Improvement of Specific Emission Factors (BACM Project No. 1), Final Report", prepared for South Coast AQMD by Midwest Research Institute, March 1996

Level 2 Emission Factor = 0.011 ton/acre-month
Construction Schedule = 30 days/month
= 0.7 lbs/acre-day
= 1.68196E-05 PM10 lbs/scf-day
6.72783E-06 PM2.5 lbs/scf-day

Bulldozer Operation and Scraper Excavation - Source: AP-42, Table 11.9.1, 7/98

$E = (0.75)(s^{1.5})/(M^{1.4})$

s = silt content = 8.5% (AP-42, Table 13.2.2-1, 12/03, construction haul route)
M = moisture content = 15.0% (SCAQMD CEQA Handbook, Table A9-9-G-1)
E = emission factor = 0.42 PM10 lb/hr
E = emission factor = 0.23 PM2.5 lb/hr

Finish Grading - Source: AP-42, Table 11.9-1, 7/98

$E = (0.60)(0.051)(S^{2.0})$

S = mean vehicle speed = 3.0 mph (estimate)
E = emission factor = 0.2754 PM10 lbs/scf-day
E = emission factor = 0.0193 PM2.5 lbs/scf-day

Unpaved Road Travel - Source: AP-42, Section 13.2.2, 11/06.

$E = (k)[(s/12)^{0.9} * (W/3)^{0.45}$

k = particle size constant = 1.5 for PM10
k = particle size constant = 0.15 for PM2.5
s = silt fraction = 8.50 (AP-42, Table 13.2.2-1, 11/06, construction sites)

Hidden Hills Dust Emission Factor Derivation

Vehicle Weights

W = water truck avg. veh. weight = 10.0 tons empty (estimated)
= 39.4 tons loaded (estimated with 8,000 gallon water capacity)
= 24.7 tons average
W = dump truck avg. veh. weight = 15.0 tons (for heavy duty Diesel trucks)
= 40.0 tons (for heavy duty Diesel trucks)
= 27.5 tons (for heavy duty Diesel trucks)
W = forklift avg. veh. weight = 8.0 tons empty (estimated)
W = auto/pickup avg. vehicle weight = 2.4 tons (CARB Area Source Manual, 9/97)
W = delivery truck avg. veh. wt. = 27.5 tons (for heavy duty Diesel trucks)
W = 3 ton truck avg. veh. Wt = 5.4 tons (estimate)
W = manlift = 25 tons (estimate from Terex Model RM75)
W = crawler crane 45 tons (estimate from Manitowoc Model 999)
W = rough terrain crane/picker = 88 tons (estimate from Grove RT 9130E)
W = farm tracotr = 3.1 tons (estimate from New Holland Model T4050)
W = scraper avg. veh. wt. = 28.2 tons empty (615 scraper, Caterpillar Performance Handbook, 10/89)
W = weight backhoe = 7.0 tons (estimate from Caterpillar model 416)
48.6 tons loaded (615 scraper, Caterpillar Performance Handbook, 10/89)
27.9 tons mean weight
W = fuel truck avg. veh. weight = 8.0 tons empty (estimated)
= 18.2 tons loaded (estimated with 3,000 gallons Diesel fuel capacity)
= 13.1 tons average
W = loader avg. veh. Weight = 33.35 tons (avg. of loaded and unloaded weights, 980H loader, Caterpillar Performance Handbook, 2006)
W= compactor wt. = 15.00 tons (estimate from Caterpillar model Cp-433)

PM10 Emission Factors

E = water truck emission factor = 2.84 lb PM10/VMT
E = dump truck emission factor = 2.98 lb PM10/VMT
E = forklift emiss. factor = 1.71 lb PM10/VMT
E = auto/pickup emiss. factor = 0.99 lb PM10/VMT
E = delivery truck emiss. factor = 2.98 lb PM10/VMT
E = man lift emission factor = 2.86 lb PM10/VMT
E = crawler crane emission factor = 3.72 lb PM10/VMT
E = rough terrain crane/picker = 5.03 lb PM10/VMT
E = farm tractor = 1.12 lb PM10/VMT
E = 3-ton truck emiss. factor = 1.43 lb PM10/VMT
E = scraper emiss. factor = 3.00 lb PM10/VMT
E = fuel truck emiss. factor = 2.13 lb PM10/VMT
E = loader emiss. factor = 3.25 lb PM10/VMT
E= backhoe emiss. factor = 1.61 lb PM10/VMT
E= compactor emiss. factor = 2.27 lb PM10/VMT

Hidden Hills Dust Emission Factor Derivation

PM2.5 Emission Factors
E = water truck emission factor = 0.28 lb PM2.5/VMT
E = dump truck emission factor = 0.30 lb PM2.5/VMT
E = forklift emiss. factor = 0.17 lb PM2.5/VMT
E = auto/pickup emiss. factor = 0.10 lb PM2.5/VMT
E = delivery truck emiss. factor = 0.30 lb PM2.5/VMT
E = man lift emission factor = 0.29 lb PM2.5/VMT
E = crawler crane emission factor = 0.37 lb PM2.5/VMT
E = rough terrain crane/picker = 0.50 lb PM2.5/VMT
E = farm tractor = 0.11 lb PM2.5/VMT
E = 3-ton truck emiss. factor = 0.14 lb PM2.5/VMT
E = scraper emiss. factor = 0.30 lb PM2.5/VMT
E = fuel truck emiss. factor = 0.21 lb PM2.5/VMT
E = loader emiss. factor = 0.33 lb PM2.5/VMT
E = backhoe emiss factor = 0.16 lb PM2.5/VMT
E = compactor emiss. Factor = 0.23 lb PM2.5/VMT

Gravel Road Travel - Source: AP-42, Section 13.2.2, 11/06.

$E = (k)[(s/12)^{0.9}*(W/3)^{0.45}$

k = particle size constant = 1.5 for PM10
k = particle size constant = 0.15 for PM2.5
s = silt fraction = 6.40 (AP-42, Table 13.2.2-1, 11/06, gravel road)

Vehicle Weights
W = water truck avg. veh. weight = 10.0 tons empty (estimated)
= 39.4 tons loaded (estimated with 8,000 gallon water capacity)
= 24.7 tons average
W = dump truck avg. veh. weight = 15.0 tons (for heavy duty Diesel trucks)
= 40.0 tons (for heavy duty Diesel trucks)
= 27.5 tons (for heavy duty Diesel trucks)
W = forklift avg. veh. weight = 8 tons empty (estimated)
PM10 Emission Factors
E = auto/pickup emiss. factor = 0.77 lb PM10/VMT
E = delivery truck emiss. factor = 2.31 lb PM10/VMT

PM2.5 Emission Factors
E = auto/pickup emiss. factor = 0.08 lb PM2.5/VMT
E = delivery truck emiss. factor = 0.23 lb PM2.5/VMT

Hidden Hills Dust Emission Factors

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

Equipment	Units	Uncontrolled PM2.5 Emission Factor (lbs/unit)	Uncontrolled PM10 Emission Factor (lbs/unit)	Control Factor (%)	Controlled PM2.5 Emission Factor (lbs/unit)	Controlled PM10 Emission Factor (lbs/unit)
Solar Field Assembly and Installation						
ISO Carrier	VMT	0.30	2.98	85%	0.04	0.44
Forklift, 10,000 lb (Propane)	VMT	0.17	1.71	85%	0.03	0.25
Air Compressor, 300 cfm	N/A	N/A	N/A	N/A	N/A	N/A
Grader	VMT	0.02	0.28	85%	0.00	0.04
Tractor	VMT	0.11	1.12	85%	0.02	0.17
Pylon Insertion Rigs	VMT	0.30	2.98	85%	0.04	0.44
Solar Field Roads Clearing, Grubbing, and Grading						
Grader	VMT	0.02	0.28	85%	0.00	0.04
Site Road Work						
Grader	VMT	0.02	0.28	85%	0.00	0.04
Scraper	VMT	0.23	0.42	85%	0.03	0.06
Paver	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Batch Plant						
Loader	VMT	0.33	3.25	85%	0.05	0.48
Transmix Trucks	VMT	0.30	2.98	85%	0.04	0.44
Tower and Boiler Erection						
Strand Jack System	N/A	N/A	N/A	N/A	N/A	N/A
Crawler Crane	VMT	0.37	3.72	85%	0.06	0.55
Rough Terrain Picker, 120 ton	VMT	0.50	5.03	85%	0.08	0.75
Rough Terrain Picker, 50 ton	VMT	0.50	5.03	85%	0.08	0.75
Forklift, 10,000 lb	VMT	0.17	1.71	85%	0.03	0.25
Compressor, 300 cfm	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	VMT	0.29	2.86	85%	0.04	0.43
Truck, Semi	VMT	0.30	2.98	85%	0.04	0.44
ACC Erection						
Crawler Crane	VMT	0.37	3.72	85%	0.06	0.55
Forklft, 50,000 lb	VMT	0.17	1.71	85%	0.03	0.25
Forklift, 10,000 lb	VMT	0.17	1.71	85%	0.03	0.25
Man Lift, 40 ft	VMT	0.29	2.86	85%	0.04	0.43
Man Lift, 85 ft	VMT	0.29	2.86	85%	0.04	0.43
Man Lift, 60 ft	VMT	0.29	2.86	85%	0.04	0.43
Truck, Semi	VMT	0.30	2.98	85%	0.04	0.44
Rough Terrain Picker	VMT	0.50	5.03	85%	0.08	0.75
Air Compressor, 300 cfm	N/A	N/A	N/A	N/A	N/A	N/A
Power Block Erection						
Crawler Crane	VMT	0.37	3.72	85%	0.06	0.55
Rough Terrain Crane, 65 Ton	VMT	0.50	5.03	85%	0.08	0.75
Rough Terrain Crane, 35 Ton	VMT	0.50	5.03	85%	0.08	0.75
Welder, 250 amp	N/A	N/A	N/A	N/A	N/A	N/A
Air Compressor, 125 cfm	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift, 60 ft	VMT	0.29	2.86	85%	0.04	0.43
Man Lift, 85 ft	VMT	0.29	2.86	85%	0.04	0.43
Man Lift, 40 ft	VMT	0.29	2.86	85%	0.04	0.43
Forklift, 10,000 lb	VMT	0.17	1.71	85%	0.03	0.25
Rough Terrain Crane, 65 Ton	VMT	0.50	5.03	85%	0.08	0.75
Miscellaneous						
Water Truck, 5,000 gal	VMT	0.28	2.84	85%	0.04	0.42
Pickup Trucks (Gasoline)	VMT	0.10	0.99	85%	0.01	0.15
AWD Gators (Gasoline)	N/A	N/A	N/A	N/A	N/A	N/A
Windblown Dust (active construction area)	SQ FT.	6.73E-06	1.68E-05	85%	1.00E-06	2.51E-06

						2013					
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Equipment	1	2	3	4	5	6	7	8	9	10	11
Solar Field Assembly and Installation											
ISO Carrier	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Forklift, 10,000 lb (Propane)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grader	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Tractor	0.0	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	1.3
Pylon Insertion Rigs	0.0	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	1.3
Solar Field Roads Clearing, Grubbing, and Grading											
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Road Work											
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper	0.0	0.0	1.2	1.2	1.2	1.2	1.2	1.2	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant											
Loader	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Transmix Trucks	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1	0.3
Tower and Boiler Erection											
Strand Jack System	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 120 ton	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Rough Terrain Picker, 50 ton	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3
Truck, Semi	0.0	0.0	0.0	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7
ACC Erection											
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Power Block Erection											
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Rough Terrain Crane, 35 Ton	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Welder, 250 amp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 125 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Man Lift, 85 ft	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Miscellaneous											
Water Truck, 5,000 gal	0.0	0.0	0.0	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Pickup Trucks (Gasoline)	0.0	0.0	0.7	0.7	0.7	0.7	0.7	0.7	2.0	2.0	2.0
AWD Gators (Gasoline)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Windblown Dust (active construction area)	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total =	0.02	0.02	2.20	6.52	8.67	11.60	11.60	11.60	11.97	11.97	11.16
Monthly Emissions (lbs/month) =	0.37	0.37	35.20	104.37	138.78	185.66	185.66	185.66	191.54	191.54	178.57
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =											
Annual Emissions - Max 12-Month Rolling Total (tons/year) =											

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA - Daily Dust Emissions (lbs/day) - PM10

						2013					
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Equipment	1	2	3	4	5	6	7	8	9	10	11
Solar Field Assembly and Installation											
ISO Carrier	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0
Forklift, 10,000 lb (Propane)	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grader	0.0	0.0	0.0	0.0	0.0	1.2	1.2	1.2	1.2	1.2	1.2
Tractor	0.0	0.0	0.0	0.0	0.0	13.2	13.2	13.2	13.2	13.2	13.2
Pylon Insertion Rigs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Solar Field Roads Clearing, Grubbing, and Grading											
Grader	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6
Site Road Work											
Grader	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0
Scraper	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant											
Loader	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Transmix Trucks	0.0	0.0	0.0	0.0	11.1	11.1	11.1	11.1	11.1	11.1	2.8
Tower and Boiler Erection											
Strand Jack System	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Rough Terrain Picker, 120 ton	0.0	0.0	0.0	0.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Rough Terrain Picker, 50 ton	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	2.6	2.6
Truck, Semi	0.0	0.0	0.0	0.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7
ACC Erection											
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker											
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Power Block Erection											
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Rough Terrain Crane, 35 Ton	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Welder, 250 amp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 125 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Man Lift, 85 ft	0.0	0.0	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Miscellaneous											
Water Truck, 5,000 gal	0.0	0.0	0.0	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1
Pickup Trucks (Gasoline)	0.0	0.0	6.7	6.7	6.7	6.7	6.7	6.7	20.0	20.0	20.0
AWD Gators (Gasoline)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Windblown Dust (active construction area)	0.0	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Total =	0.23	0.23	10.36	53.59	75.10	91.71	91.71	91.71	104.94	104.94	96.84
Monthly Emissions (lbs/month) =	3.67	3.67	165.78	857.43	1,201.56	1,467.33	1,467.33	1,467.33	1,679.03	1,679.03	1,549.36
Annual Emissions (lbs/year) =											
Annual Emissions (tons/year) =											

	2014										
Equipment	Jan 12	Feb 13	Mar 14	Apr 15	May 16	Jun 17	Jul 18	Aug 19	Sep 20	Oct 21	Nov 22
Solar Field Assembly and Installation											
ISO Carrier	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Forklift, 10,000 lb (Propane)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grader	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Tractor	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Pylon Insertion Rigs	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Solar Field Roads Clearing, Grubbing, and Grading											
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Road Work											
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant											
Loader	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Transmix Trucks	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Boiler Erection											
Strand Jack System	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 120 ton	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 50 ton	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.7	0.7	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0
ACC Erection											
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Man Lift, 85 ft	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Man Lift, 60 ft	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3
Rough Terrain Picker	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Power Block Erection											
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Rough Terrain Crane, 35 Ton	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Welder, 250 amp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 125 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Man Lift, 85 ft	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Man Lift, 40 ft	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Miscellaneous											
Water Truck, 5,000 gal	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Pickup Trucks (Gasoline)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
AWD Gators (Gasoline)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Windblown Dust (active construction area)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total =	11.23	11.12	11.20	11.20	11.20	9.88	10.37	10.37	10.23	10.23	10.16
Monthly Emissions (lbs/month) =	179.67	177.94	179.20	179.20	179.20	158.12	165.86	165.86	163.73	163.73	162.48
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =											
Annual Emissions - Max 12-Month Rolling Total (tons/year) =											

Hidden Hills Solar Electric Generating System (Total Both Pla

	2014										
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Equipment	12	13	14	15	16	17	18	19	20	21	22
Solar Field Assembly and Installation											
ISO Carrier	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Forklift, 10,000 lb (Propane)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grader	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Tractor	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
Pylon Insertion Rigs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Solar Field Roads Clearing, Grubbing, and Grading											
Grader	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Site Road Work											
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant											
Loader	0.8	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Transmix Trucks	2.8	2.8	2.8	2.8	2.8	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Boiler Erection											
Strand Jack System	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 120 ton	1.8	1.8	1.8	1.8	1.8	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 50 ton	0.9	0.9	0.9	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	6.7	6.7	6.7	6.7	6.7	0.0	0.0	0.0	0.0	0.0	0.0
ACC Erection											
Crawler Crane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0
Forklft, 50,000 lb	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Forklift, 10,000 lb	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Man Lift, 40 ft	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Man Lift, 85 ft	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Man Lift, 60 ft	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0
Rough Terrain Picker											
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Power Block Erection											
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5
Rough Terrain Crane, 65 Ton	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Rough Terrain Crane, 35 Ton	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Welder, 250 amp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 125 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Man Lift, 85 ft	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.0	0.0	0.0
Man Lift, 40 ft	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Forklift, 10,000 lb	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Rough Terrain Crane, 65 Ton	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0
Miscellaneous											
Water Truck, 5,000 gal	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1
Pickup Trucks (Gasoline)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
AWD Gators (Gasoline)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Windblown Dust (active construction area)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Total =	97.52	96.44	97.23	97.23	97.23	84.05	87.09	87.09	85.76	85.76	84.98
Monthly Emissions (lbs/month) =	1,560.33	1,543.09	1,555.63	1,555.63	1,555.63	1,344.84	1,393.48	1,393.48	1,372.19	1,372.19	1,359.65
Annual Emissions (lbs/year) =											
Annual Emissions (tons/year) =											

		2015							
Equipment	Dec 23	Jan 24	Feb 25	Mar 26	Apr 27	May 28	Jun 29	Jul 30	Aug 31
Solar Field Assembly and Installation									
ISO Carrier	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb (Propane)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grader	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tractor	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pylon Insertion Rigs	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Solar Field Roads Clearing, Grubbing, and Grading									
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Road Work									
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant									
Loader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transmix Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Boiler Erection									
Strand Jack System	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 120 ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 50 ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ACC Erection									
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0
Rough Terrain Picker	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Power Block Erection									
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Rough Terrain Crane, 35 Ton	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Welder, 250 amp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 125 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous									
Water Truck, 5,000 gal	3.8	3.8	3.8	3.8	3.8	0.0	0.0	0.0	0.0
Pickup Trucks (Gasoline)	2.0	2.0	2.0	2.0	0.7	0.7	0.7	0.7	0.0
AWD Gators (Gasoline)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Windblown Dust (active construction area)	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total =	9.98	6.56	6.54	6.31	4.98	0.67	0.67	0.67	0.00
Monthly Emissions (lbs/month) =	159.61	104.99	104.63	100.98	79.62	10.68	10.68	10.68	0.00
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =									2,078
Annual Emissions - Max 12-Month Rolling Total (tons/year) =									1.0

Hidden Hills Solar Electric Generating System (Total Both Pla

		2015							
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Equipment	23	24	25	26	27	28	29	30	31
Solar Field Assembly and Installation									
ISO Carrier	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb (Propane)	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grader	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tractor	13.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pylon Insertion Rigs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Solar Field Roads Clearing, Grubbing, and Grading									
Grader	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Road Work									
Grader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Batch Plant									
Loader	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transmix Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Boiler Erection									
Strand Jack System	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 120 ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Picker, 50 ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ACC Erection									
Crawler Crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklft, 50,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Semi	3.0	3.0	3.0	3.0	3.0	0.0	0.0	0.0	0.0
Rough Terrain Picker									
Air Compressor, 300 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Power Block Erection									
Crawler Crane	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0
Rough Terrain Crane, 35 Ton	1.3	1.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0
Welder, 250 amp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Compressor, 125 cfm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 60 ft	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 85 ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Man Lift, 40 ft	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forklift, 10,000 lb	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Terrain Crane, 65 Ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous									
Water Truck, 5,000 gal	38.1	38.1	38.1	38.1	38.1	0.0	0.0	0.0	0.0
Pickup Trucks (Gasoline)	20.0	20.0	20.0	20.0	6.7	6.7	6.7	6.7	0.0
AWD Gators (Gasoline)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Windblown Dust (active construction area)	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total =	83.18	63.82	63.59	63.11	49.76	6.67	6.67	6.67	0.00
Monthly Emissions (lbs/month) =	1,330.91	1,021.13	1,017.46	1,009.82	796.23	106.80	106.80	106.80	0.00
Annual Emissions (lbs/year) =									17,583
Annual Emissions (tons/year) =									8.8

Hidden Hills Concrete Batching Schedule

	Cubic Yards of Concrete Per Day																
	2013											20					
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Equipment	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Concrete Batching	0	0	0	0	1,000	1,000	1,000	1,000	1,000	1,000	1,000	500	5,000	5,000	5,000	0	0
Total (cubic yards/month)	0	0	0	0	16,000	16,000	16,000	16,000	16,000	16,000	16,000	8,000	80,000	80,000	80,000	0	0
Total (cubic yards)																	

Hidden Hills Concrete Batching Sch

	14						2015							
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Equipment	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Concrete Batching	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total (cubic yards/month)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total (cubic yards)														360,000

Hidden Hills Concrete Batch Plant Emission Factors

Controlled Batch Plant Emission Factors(1)

	Emission Factors			Ton Material Material Per Ton Concete	Emission Factors			Ton Per Cubic Yard	Emission Factors		
Operation	PM10	PM2.5(3)	Units		PM10	PM2.5(3)	Units		PM10	PM2.5(3)	Units
Aggregate Transfer	9.90E-04	1.49E-04	lb/ton aggregate	0.46	4.55E-04	6.83E-05	lb/ton concrete	2.012	9.16E-04	1.37E-04	lb/cy
Sand Transfer	2.97E-04	4.46E-05	lb/ton sand	0.35	1.04E-04	1.56E-05	lb/ton concrete	2.012	2.09E-04	3.14E-05	lb/cy
Cement Unloading to Elevated Storage Silo	3.40E-04	5.10E-05	lb/ton cement supplement	0.12	4.08E-05	6.12E-06	lb/ton concrete	2.012	8.21E-05	1.23E-05	lb/cy
Cement Supplement Unloading to Storage Silo	4.90E-03	7.35E-04	lb PM10/ton cement	0.02	9.80E-05	1.47E-05	lb/ton concrete	2.012	1.97E-04	2.96E-05	lb/cy
Weigh Hopper Loading	8.40E-04	1.26E-04	lb/ton concrete	1	8.40E-04	1.26E-04	lb/ton concrete	2.012	1.69E-03	2.54E-04	lb/cy
Truck Loading	5.50E-03	8.25E-04	lb/ton concrete	1	5.50E-03	8.25E-04	lb/ton concrete	2.012	1.11E-02	1.66E-03	lb/cy

(1)Emission factors from AP-42, Section 11.12, June 2006

(2)The batch plant will have dust control equipment achieving a 70% control efficiency during sand and aggregate transfer. Source for control efficiency: BAAQMD Permit Handbook, Section 11.5 Concrete Batch Plants, March 2009.

(3)PM2.5 factor derived from PM10 factor and the ratio of particlae size multipliers contained in Equation 11.12-1.

Hidden Hills Batch Plant Emissions

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA - Daily Concrete Batching Emissions (lbs/day) - PM10

	PM10 Emissions (lb/day)											
	2013											
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Operation	1	2	3	4	5	6	7	8	9	10	11	12
Aggregate Transfer	0.00	0.00	0.00	0.00	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.46
Sand Transfer	0.00	0.00	0.00	0.00	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.10
Cement Unloading to Elevated Storage Silo	0.00	0.00	0.00	0.00	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.04
Cement Supplement Unloading to Storage Silo	0.00	0.00	0.00	0.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.10
Weigh Hopper Loading	0.00	0.00	0.00	0.00	1.69	1.69	1.69	1.69	1.69	1.69	1.69	0.85
Truck Loading	0.00	0.00	0.00	0.00	11.07	11.07	11.07	11.07	11.07	11.07	11.07	5.53
Total =	0.00	0.00	0.00	0.00	14.16	14.16	14.16	14.16	14.16	14.16	14.16	7.08
Monthly Emissions (lbs/month) =	0.00	0.00	0.00	0.00	226.57	226.57	226.57	226.57	226.57	226.57	226.57	113.29
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =												
Annual Emissions - Max 12-Month Rolling Total (tons/year) =												

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA - Daily Concrete Batching Emissions (lbs/day) - PM2.5

	PM2.5 Emissions (lb/day)											
	2013											
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Operation	1	2	3	4	5	6	7	8	9	10	11	12
Aggregate Transfer	0.00	0.00	0.00	0.00	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.07
Sand Transfer	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02
Cement Unloading to Elevated Storage Silo	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cement Supplement Unloading to Storage Silo	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.01
Weigh Hopper Loading	0.00	0.00	0.00	0.00	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.13
Truck Loading	0.00	0.00	0.00	0.00	1.66	1.66	1.66	1.66	1.66	1.66	1.66	0.83
Total =	0.00	0.00	0.00	0.00	2.12	2.12	2.12	2.12	2.12	2.12	2.12	1.06
Monthly Emissions (lbs/month) =	0.00	0.00	0.00	0.00	33.99	33.99	33.99	33.99	33.99	33.99	33.99	16.99
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =												
Annual Emissions - Max 12-Month Rolling Total (tons/year) =												

Hidden Hills Batch Plant Emissions

Hidden Hills Solar Electric Generating System (Total Both

	2014											
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Operation	13	14	15	16	17	18	19	20	21	22	23	24
Aggregate Transfer	4.58	4.58	4.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sand Transfer	1.05	1.05	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cement Unloading to Elevated Storage Silo	0.41	0.41	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cement Supplement Unloading to Storage Silo	0.99	0.99	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weigh Hopper Loading	8.45	8.45	8.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Loading	55.33	55.33	55.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total =	70.80	70.80	70.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Monthly Emissions (lbs/month) =	1132.86	1132.86	1132.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =												
Annual Emissions - Max 12-Month Rolling Total (tons/year) =												

Hidden Hills Solar Electric Generating System (Total Both

	2014											
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Operation	13	14	15	16	17	18	19	20	21	22	23	24
Aggregate Transfer	0.69	0.69	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sand Transfer	0.16	0.16	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cement Unloading to Elevated Storage Silo	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cement Supplement Unloading to Storage Silo	0.15	0.15	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weigh Hopper Loading	1.27	1.27	1.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Loading	8.30	8.30	8.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total =	10.62	10.62	10.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Monthly Emissions (lbs/month) =	169.93	169.93	169.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =												
Annual Emissions - Max 12-Month Rolling Total (tons/year) =												

Hidden Hills Batch Plant Emissions

Hidden Hills Solar Electric Generating System (Total Both

	2015						
	Feb	Mar	Apr	May	Jun	Jul	Aug
Operation	25	26	27	28	29	30	31
Aggregate Transfer	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sand Transfer	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cement Unloading to Elevated Storage Silo	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cement Supplement Unloading to Storage Silo	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weigh Hopper Loading	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Loading	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total =	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Monthly Emissions (lbs/month) =	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =							5097.87
Annual Emissions - Max 12-Month Rolling Total (tons/year) =							2.5

Hidden Hills Solar Electric Generating System (Total Both

	2015						
	Feb	Mar	Apr	May	Jun	Jul	Aug
Operation	25	26	27	28	29	30	31
Aggregate Transfer	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sand Transfer	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cement Unloading to Elevated Storage Silo	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cement Supplement Unloading to Storage Silo	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weigh Hopper Loading	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Loading	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total =	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Monthly Emissions (lbs/month) =	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual Emissions - Max 12-Month Rolling Total (lbs/year) =							764.68
Annual Emissions - Max 12-Month Rolling Total (tons/year) =							0.4

Appendix 5.1G

Revised April 2012

Cumulative Impacts Analysis

Data Responses 2 and 3 from

Hidden Hills Solar Electric Generating System (HHSEGS)

(11-AFC-2)

Data Response, Set 1A
(Response to Data Requests 1 though 50)

Submitted to the

California Energy Commission

Submitted by

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

November 2011

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

Air Quality (1–14)

Background – Air Quality Permit Application Process

A Determination of Compliance (DOC) analysis from Great Basin Unified Air Pollution Control District (GBUAPCD) will be needed for staff's analysis. Staff will need to coordinate with the applicant and District to keep apprised of any air quality issues determined by the District during GBUAPCD's permit review.

Data Request

1. Please provide copies of any official submittals and correspondence to or from the GBUAPCD that you have already submitted to the GBUAPCD if the substance is not contained in the AFC and any additional correspondence within 5 days of their submittal to or their receipt from the District. This request is to remain in effect until the Final Determination of Compliance is issued by the District.

Response: Applicant will provide copies of substantive District correspondence, including e-mail messages, related to the permit application within 5 days of submittal or receipt, provided that this correspondence does not contain information that is privileged or confidential. Copies will be provided until the Final Determination of Compliance is issued by the District. Copies of submittals to and correspondence from the GBUAPCD that we have exchanged with the District to date and that were not included in the AFC have been docketed (Log # 62098, dated 8/29/11; and Log# 62518, dated 10/5/11).

Background – Cumulative Impacts

The applicant's cumulative impact analysis, including information presented in Section 5.1.5 of the AFC, does not seem to include a list of permitted projects from the GBUAPCD. Staff needs to make sure that there are no other large stationary sources that have recently been permitted, or are in the permitting process near the site. Also, because this site is located so close to the California and Nevada Border, please include all projects in the Clark County (NV), and Nevada Department of Air Quality Management, Bureau of Air Pollution Control.

Data Request

2. Please confirm there are no projects so far from the GBUAPCD or other necessary agencies with large stationary source projects that will have permitted emissions, for projects with greater than 5 tons of permitted emissions of any single criteria pollutant. Include projects located within six miles of the project site that have been recently permitted, but did not start operation or are in the process of being permitted.

Response: Applicant requested information for a cumulative impact analysis from the GBUAPCD, Clark County Department of Air Quality and Environmental Management, and the Nevada Division of Environmental Protection, Department of Air Quality Management, Bureau of Air

Pollution Control ("Nevada DEP"). The request letters and any agency responses received before the AFC was filed were included in Attachment 5.1G-1 to Appendix 5.1G of the AFC.

To summarize, the GBUAPCD responded that "[t]here are no facilities in the District, other than the St. Therese project, within 6 miles of the perimeter of the Hidden Hills Ranch project." Nevada DEP responded with a list of active permits in the general project area. Attachment 5.1G-1 includes the list provided by Nevada DEP and a description of the analysis used to determine that none of the projects on the list provided by Nevada DEP is within 6 miles of the project site.

The Clark County response to the request for information regarding potential sources to be included in a cumulative impacts analysis was received on August 25, 2011 after the AFC had been filed, and was docketed on August 29. Clark County responded:

> We have five permitted sources in, or near, that hydrographic area, but, none of these are within the 6 miles perimeter of the site you have identified. In fact, it appears the closest permitted source is over 20 miles away. Our search of our records did not indicate any proposed authority to construct projects within the area for which we have received an application.

Copies of the agency correspondence, demonstrating that there are no projects meeting the criteria of the request, are provided in Attachment DR2-1.

Data Request

3. Please provide a cumulative impacts modeling analysis in consultation with energy commission staff, if necessary, based on the project list provided by GBUAPCD.

Response: As discussed in Data Response 2, there are no stationary source projects meeting the criteria, so no cumulative impacts modeling analysis is necessary.

Background – Baseline Site Conditions

In order to evaluate the air quality impacts from this project the current baseline conditions of the project site need to be understood.

Data Request

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

Response: According to survey crews who have visited the project site, the site is mostly vacant, disturbed land. Portions of the site have been graded and a dirt road grid laid out for anticipated development as residential property, but no residential or other development has taken place within the project site boundaries. The only onsite activity that could currently emit combustion and fugitive dust emissions is casual vehicle traffic, which would be sporadic as there are no activities taking place on the property that would attract regular vehicle traffic and therefore cannot be quantified with any degree of accuracy.

From: Richard Beckstead <Beckstead@ClarkCountyNV.gov>
Sent: Friday, August 26, 2011 11:39 AM
To: Nancy L. Matthews; Lewis Wallenmeyer
Cc: Tina Gingras; Dennis Ransel; Harish Agarwal
Subject: RE: solar thermal project for southern Inyo County, CA

Nancy,

I am the Permitting Manager for the Department of Air Quality and Environmental Management. Lewis has requested that I research this and provide you with what information we have available. I am providing this email response since you have stated this would be adequate.

We have five permitted sources in, or near, that hydrographic area, but, none of these are within the 6 miles perimeter of the site you have identified. In fact, it appears the closest permitted source is over 20 miles away. Our search of our records did not indicate any proposed authority to construct projects within the area for which we have received an application.

If there is anything other information you require, please let me know.

Richard D. Beckstead
Permitting Manager - DAQEM
(702) 455-1669
beckstead@ClarkCountyNV.gov

From: Nancy L. Matthews [mailto:NMatthews@sierraresearch.com]
Sent: Thursday, August 25, 2011 3:53 PM
To: Lewis Wallenmeyer
Cc: Tina Gingras; Dennis Ransel; Richard Beckstead; Nancy L. Matthews
Subject: RE: solar thermal project for southern Inyo County, CA

Hi again—

I believe this request may have fallen through the cracks. I apologize for not following up sooner, but we have now filed our application with the California Energy Commission and the Great Basin Unified APCD and we expect that we will receive a request for the cumulative impacts analysis in the next few weeks.

If you have determined that there are no facilities within 6 miles of the project site that meet the criteria outlined in the letter, an email response to that effect would be adequate for our response to the agencies.

If you have any questions regarding this request, please do not hesitate to email me. I will be out of the office for the next 3 weeks, but will be available by email.

Thanks very much--

Nancy Matthews
Sierra Research
1801 J Street

Sacramento, CA 95811
nmatthews@sierraresearch.com
916-273-5124 (direct)
916-444-6666 (main)
916-444-8373 (fax)

From: Lewis Wallenmeyer [mailto:Wallenmeyer@ClarkCountyNV.gov]
Sent: Thursday, June 02, 2011 11:25 AM
To: Nancy L. Matthews
Cc: Jan Sudomier; Tina Gingras; Dennis Ransel; Richard Beckstead
Subject: RE: solar thermal project for southern Inyo County, CA

Thank you for your letter. We will conduct a review and prepare a letter of response to you.

Lewis

Lewis Wallenmeyer
Director
Department of Air Quality and Environmental Management
Clark County
500 S. Grand Central Parkway
P.O. Box 555210
Las Vegas, NV 89155-5210
(702) 455-1600
visit us at: www.clarkcountynv.gov

From: Nancy L. Matthews [mailto:NMatthews@sierraresearch.com]
Sent: Thursday, June 02, 2011 10:47 AM
To: Lewis Wallenmeyer
Cc: Nancy L. Matthews; Jan Sudomier
Subject: solar thermal project for southern Inyo County, CA

Dear Mr. Wallenmeyer—

As Jan Sudomier of the Great Basin Unified APCD indicated last week, a solar project is proposed for development in the Charleston View / Calvada Springs area in the south east corner of Inyo County (near Pahrump). Attached is a letter requesting information regarding other development in the project area.

Thank you very much for your assistance. If you have any questions regarding the information we are requesting, please do not hesitate to call or email me.

Nancy Matthews
916-273-5124

APPENDIX 5.1G

Cumulative Impacts Analysis

Cumulative air quality impacts from the HHSEGS and other reasonably foreseeable projects will be both regional and localized in nature. Regional air quality impacts are possible for pollutants such as ozone and $PM_{2.5}$ which are formed through photochemical processes that can take hours to occur. Carbon monoxide, NOx, and SOx impacts are generally localized in the area in which they are emitted. PM_{10} can create a local air quality problem in the vicinity of its emission source, but can also be a regional issue when it is formed in the atmosphere from VOC, SOx, and NOx.

The cumulative impacts analysis considers the potential for both regional and localized impacts due to emissions from proposed operation of the HHSEGS. Regional impacts are evaluated by comparing maximum daily and annual emissions from the project with emissions of ozone and PM precursors in Inyo County. Localized impacts are evaluated by looking at other local sources of pollutants that are not included in the background air quality data to determine whether these sources in combination with HHSEGS would be expected to cause significant cumulative air quality impacts.

Regional Impacts

Regional impacts are normally evaluated by assessing the project's contribution to regional emissions. Although the relative importance of VOC and NOx emissions in ozone formation differs from region to region and from day to day, state law requires reductions in emissions of both precursors to reduce overall ozone levels. The change in the sum of emissions of these pollutants, equally weighted, is used to provide a rough estimate of the impact of the project on regional ozone levels. However, because of the rural and relatively undeveloped nature of the project area (southern Inyo County), the GBUAPCD and ARB have determined that ozone concentrations in the area largely reflect the impact of transport from the South Coast Air Basin and the San Joaquin Valley Air Basin.[1] Therefore, in this instance a comparison of project emissions with emissions in the air basin is not particularly informative because regional air quality is not correlated with local or regional sources of emissions. However, this also suggests that the project emissions will have minimal impact on local ozone levels because the majority of ozone in the project area comes from outside the air basin.

A comparison of the emissions of PM_{10} and $PM_{2.5}$ precursor emissions from the project with regional PM_{10} and $PM_{2.5}$ precursor emissions can be used to provide an estimate of the impact of the Project on regional PM_{10} and $PM_{2.5}$ levels. As discussed above, emissions of NOx and VOC, which are $PM_{10}/PM_{2.5}$ precursors as well as ozone precursors, are relatively low. The majority of regional PM_{10} and $PM_{2.5}$ comes from directly emitted particulate matter in the form of unpaved road dust and fugitive windblown dust.

---

[1] CARB, "State Of California Information To Support Nonattainment Area Boundary Recommendations For The 2008 Federal 8-Hour Ozone Standard," Enclosure 3. March 2009.

Table 5.1G-1 summarizes these comparisons. Project emissions are compared with projected regional emissions in 2015. Inyo County emissions projections for 2015 were obtained using CARB's web-based emission inventory projection software.[2] Emissions from the project would result in very small increases in total emissions in the county. Because of the relatively small emissions contribution from the project and because regional air quality is heavily influenced by transport, we expect that the overall impact of the project on regional air quality will not be significant.

TABLE 5.1G-1
Comparison of Project Emissions to Regional Precursor Emissions in 2015: Annual Basis[a]

Ozone Precursors – Annual Basis	
Total Inyo County Ozone Precursors, tons/year	3,423
Total Project Ozone Precursor Emission, tons/year	13.4
Project Emissions as Percentage of Countywide Ozone Precursor Emissions	0.4%
PM_{10} Precursors – Annual Basis	
Total Inyo County PM_{10} Precursors, tons/year	19,272
Total Project PM_{10} Precursor Emissions, tons/year	19.5
Project Emissions as Percentage of Countywide PM_{10} Precursor Emissions	0.1%
$PM_{2.5}$ Precursors – Annual Basis	
Total Inyo County $PM_{2.5}$ Precursors, tons/year	5,931
Total Project $PM_{2.5}$ Precursor Emissions, tons/year	19.5
Project Emissions as Percentage of Countywide $PM_{2.5}$ Precursor Emissions	0.3%

[a] Basin-wide emissions calculated as 365 times daily emissions

Localized Impacts

To evaluate potential cumulative impacts of the project in combination with other projects in the area, we requested from the GBUAPCD, Clark County (NV), and Nevada Department of Air Quality Management, Bureau of Air Pollution Control, information regarding projects within a radius of 10 km (6 miles) of the project.

Within this search area, two types of projects were used as criteria for identification:

- Projects for which air pollution permits to construct have been issued since January 1, 2010; and
- Projects for which air pollution permits to construct have not been issued, but that are reasonably foreseeable.

Existing projects that have been in operation since at least 2010 are reflected in the ambient air quality data that has been used to represent background concentrations; consequently, no further analysis of the emissions from this category of facilities is required. The cumulative impacts analysis adds the modeled impacts of selected facilities to the maximum

---

[2] http://www.arb.ca.gov/app/emsinv/fcemssumcat2009.php, accessed June 2011.

measured background air quality levels, thus ensuring that these existing projects are taken into account.

Copies of the information requests for information about potential projects are attached. At the time the AFC was being prepared, we had not yet received responses from the Nevada air agencies. The GBUAPCD responded that the only facility in the District meeting these criteria is the St. Therese Mission project. The St. Therese Mission project was required to obtain an Authority to Construct from the GBUAPCD under District Rule 216-A (New Source Review Requirements for Determining Impacts on Air Quality: Secondary Sources). The only potential air emissions identified for that project were fugitive dust from construction, which will be required to be minimized. The certified negative declaration for the project did not identify any potentially significant air quality impacts. Construction of the St. Therese Mission project is expected to be completed before construction begins on the HHSEGS. Therefore, the St. Therese Mission project is not expected to result in any cumulative impacts.

Additional planned development projects that will not involve air permits include the Pahrump Valley General Aviation Airport and the Element Power Solar Project.

The Pahrump Valley General Aviation Airport project site is located approximately 10 miles northwest of the HHSEGS site. The initial phase of the project could be under construction around the same time as the HHSEGS. However, because the project would be 10 miles away and construction impacts tend to be highly localized, it is unlikely to result in any cumulative impacts.

The Element Power Solar Project is being proposed for construction approximately 6 miles north of HHSEGS. Because the project is a photovoltaic project, it is unlikely to have any operational air quality impacts. No information about the construction schedule is available; however, even if the project construction schedule were to coincide with HHSEGS project construction, the localized construction impacts are unlikely to cause any cumulative impacts with HHSEGS.

In the event that Clark County or Nevada DAQM identifies any stationary sources that could contribute to a significant impact, a supplement to this cumulative impacts analysis will be prepared in accordance with Section 3.10 of the modeling protocol (see Appendix 5.1H).

ATTACHMENT 5.1G-1

Correspondence Related To Cumulative Impacts Analysis

sierra
research

1801 J Street
Sacramento, CA 95811
Tel: (916) 444-6666
Fax: (916) 444-8373
Ann Arbor, MI
Tel: (734) 761-6666
Fax: (734) 761-6755

May 24, 2011

Mr. Theodore Schade
Great Basin Unified Air Pollution Control District
157 Short Street
Bishop, CA 93514-3537

Re: Cumulative Impacts Analysis
BrightSource Energy Hidden Hills Ranch Solar Electric Generating Station

Dear Mr. Schade:

BrightSource Energy (BSE) will be submitting an application for a Determination of Compliance to the District and an Application for Certification to the California Energy Commission for the Hidden Hills Ranch Solar Electric Generating Station (HHR SEGS) in July of this year. BSE is proposing to construct a 500 MW solar thermal power plant in southern Inyo County between Tecopa and the state line. A map showing the location of the proposed project is attached. As part of the project review, the CEC requires BSE to prepare an analysis of the project's cumulative air quality impacts. This is defined by the CEC as "a cumulative air quality modeling impacts analysis of the project's typical operating mode in combination with other stationary source emissions sources **within a six-mile radius** *which have received construction permits but are not yet operating, or are in the permitting process*." [Emphasis added.] We have interpreted this as follows:

- Projects for which permits to construct have been issued since January 1, 2010; and
- Projects for which permits to construct have not been issued, but are reasonably foreseeable.

We would like to obtain from the District a list of projects within six miles of the new power plant location for which permits to construct have been issued since January 1, 2010, and for which permits to construct have not been issued, but are reasonably foreseeable, along with sufficient emissions information and stack parameters so that we can include these sources in our air quality modeling. Facilities that meet these criteria but emit only VOCs can be excluded.

Thank you very much for your assistance. If you have any questions regarding the information we are requesting, feel free to call.

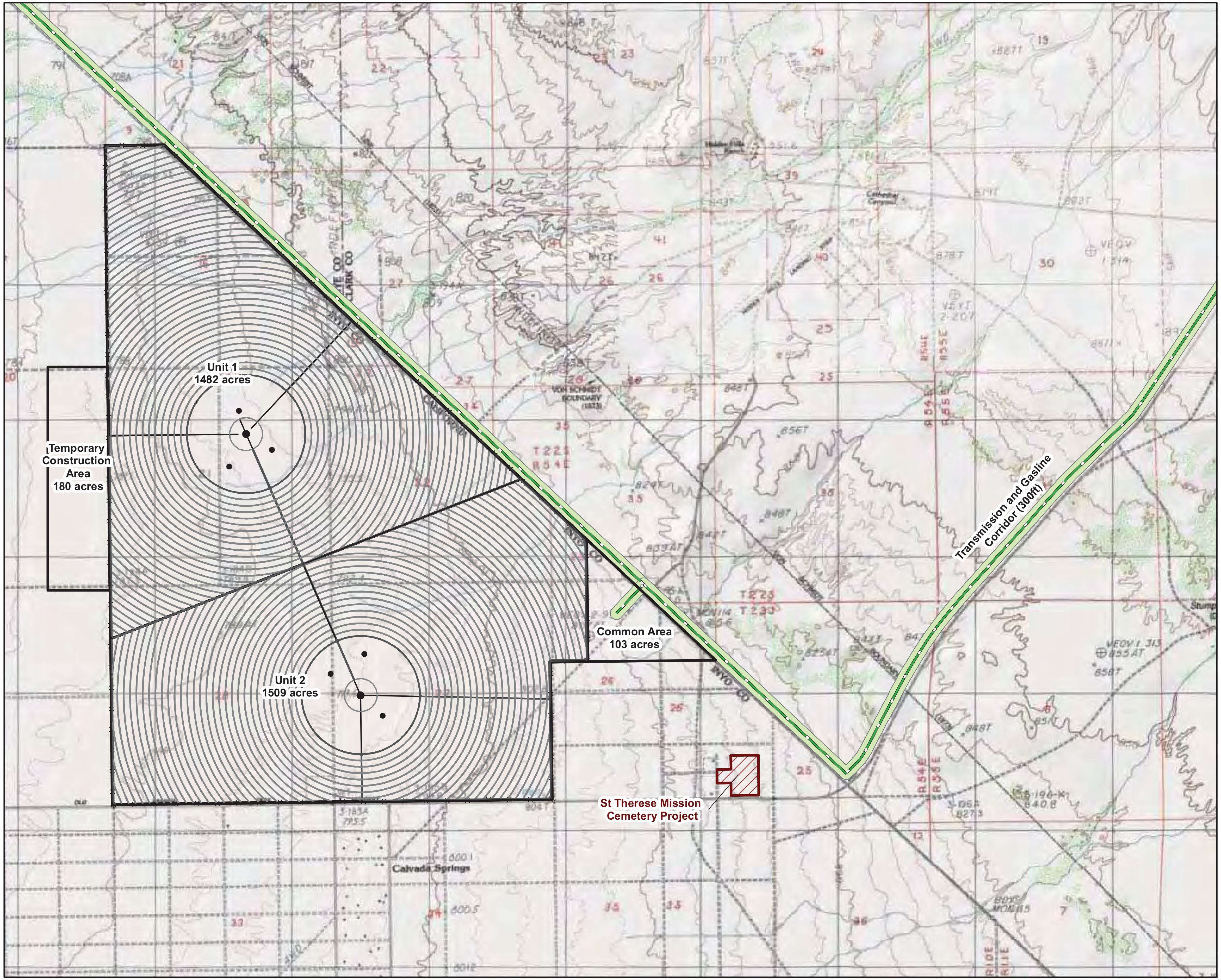
Sincerely,

Nancy Matthews

Nancy Matthews

Attachment

cc: Clay Jensen, BrightSource Energy
Susan Strachan, Strachan Consulting



VICINITY MAP

LEGEND

- ● Solar Towers
- • Solar Field Points
- ×—× Project Site Fence
- — Solar Field Paths
- — Access Roads
- 🟩 Survey Corridor (300ft)
- 🟩 Survey Corridor (300ft)
- ▨ St Therese Mission Cemetery Project
- ☐ Project Boundary

Notes:
1. Area of interest subject to change.

N

0 1,200 2,400
Feet

Figure 1
Hidden Hills Site and Propsed Transmission Lines
Hidden Hills

SAC \\ZION\SACGIS\PROJ\SOLARPROJECTS\HIDDENHILLS\MAPFILES\2011_HIDDENHILLS\HIDDENHILLS_SITE.PDF.MXD SSCOPES 4/13/2011 4:20:48 PM

CH2MHILL

Nancy L. Matthews

From: Jan Sudomier <Jan@gbuapcd.org>
Sent: Thursday, June 09, 2011 8:35 AM
To: Nancy L. Matthews
Subject: RE: BrightSource Energy Hidden Hills Ranch-- cumulative impacts information

There are no facilities in the District, other than the St. Therese project, within 6 miles of the perimeter of the Hidden Hills Ranch project

---

From: Nancy L. Matthews [mailto:NMatthews@sierraresearch.com]
Sent: Wednesday, June 08, 2011 5:09 PM
To: Jan Sudomier
Cc: Nancy L. Matthews
Subject: FW: BrightSource Energy Hidden Hills Ranch-- cumulative impacts information

Jan-- Were you able to determine whether there are any sources (other than St Therese) in the District that would meet these criteria?

Thank you--

Nancy

From: Ted Schade [mailto:tschade@gbuapcd.org]
Sent: Tuesday, May 24, 2011 4:21 PM
To: Nancy L. Matthews
Subject: Re: BrightSource Energy Hidden Hills Ranch-- cumulative impacts information

Duane - please assist. I would imagine we have no cumulative sources in this area.

Ted

On May 24, 2011, at 4:00 PM, "Nancy L. Matthews" <NMatthews@sierraresearch.com> wrote:

> Hello, Ted—
>
> Attached please find a request for information regarding potential sources of emissions in the vicinity of BrightSource Energy’s proposed Hidden Hills Ranch solar power plant project site. If you have any questions regarding this information request, please feel free to call.
>
> Thank you for your assistance--
>
> Nancy Matthews
>
> Sierra Research

1801 J Street

Sacramento, CA 95811

nmatthews@sierraresearch.com

916-273-5124 (direct)

916-444-6666 (main)

916-444-8373 (fax)

<GBV cumulative info 052411.pdf>

sierra
research

1801 J Street
Sacramento, CA 95811
Tel: (916) 444-6666
Fax: (916) 444-8373
Ann Arbor, MI
Tel: (734) 761-6666
Fax: (734) 761-6755

June 2, 2011

Mr. Larry Kennedy
State of Nevada, Division of Environmental Protection
Bureau of Air Pollution Control
901 So. Stewart St., Suite 4001
Carson City, NV 89701

Re: Cumulative Impacts Analysis
BrightSource Energy Hidden Hills Solar Electric Generating Facility

Dear Mr. Kennedy:

BrightSource Energy (BSE) is proposing to construct a 500 MW solar thermal power plant in southern Inyo County, California, along the California-Nevada state line. A map showing the location of the proposed project is attached. BSE will be submitting an application for a Determination of Compliance to the Great Basin Unified Air Pollution Control District and an Application for Certification to the California Energy Commission for the Hidden Hills Solar Electric Generation Facility in July of this year. As part of the project review, the CEC requires BSE to prepare an analysis of the project's cumulative air quality impacts. This is defined by the CEC as "a cumulative air quality modeling impacts analysis of the project's typical operating mode in combination with other stationary source emissions sources **within a six-mile radius** *which have received construction permits but are not yet operating, or are in the permitting process*." [Emphasis added.] We have interpreted this as follows:

- Projects for which permits to construct have been issued since January 1, 2010; and
- Projects for which permits to construct have not been issued, but are reasonably foreseeable.

We would like to obtain from BAPC a list of projects within your jurisdiction located within six miles of the new power plant location for which permits to construct have been issued since January 1, 2010, and for which permits to construct have not been issued, but are reasonably foreseeable, along with sufficient emissions information and stack parameters so that we can include these sources in our air quality modeling. Facilities that meet these criteria but emit only VOCs can be excluded.

Thank you very much for your assistance. If you have any questions regarding the information we are requesting, feel free to call.

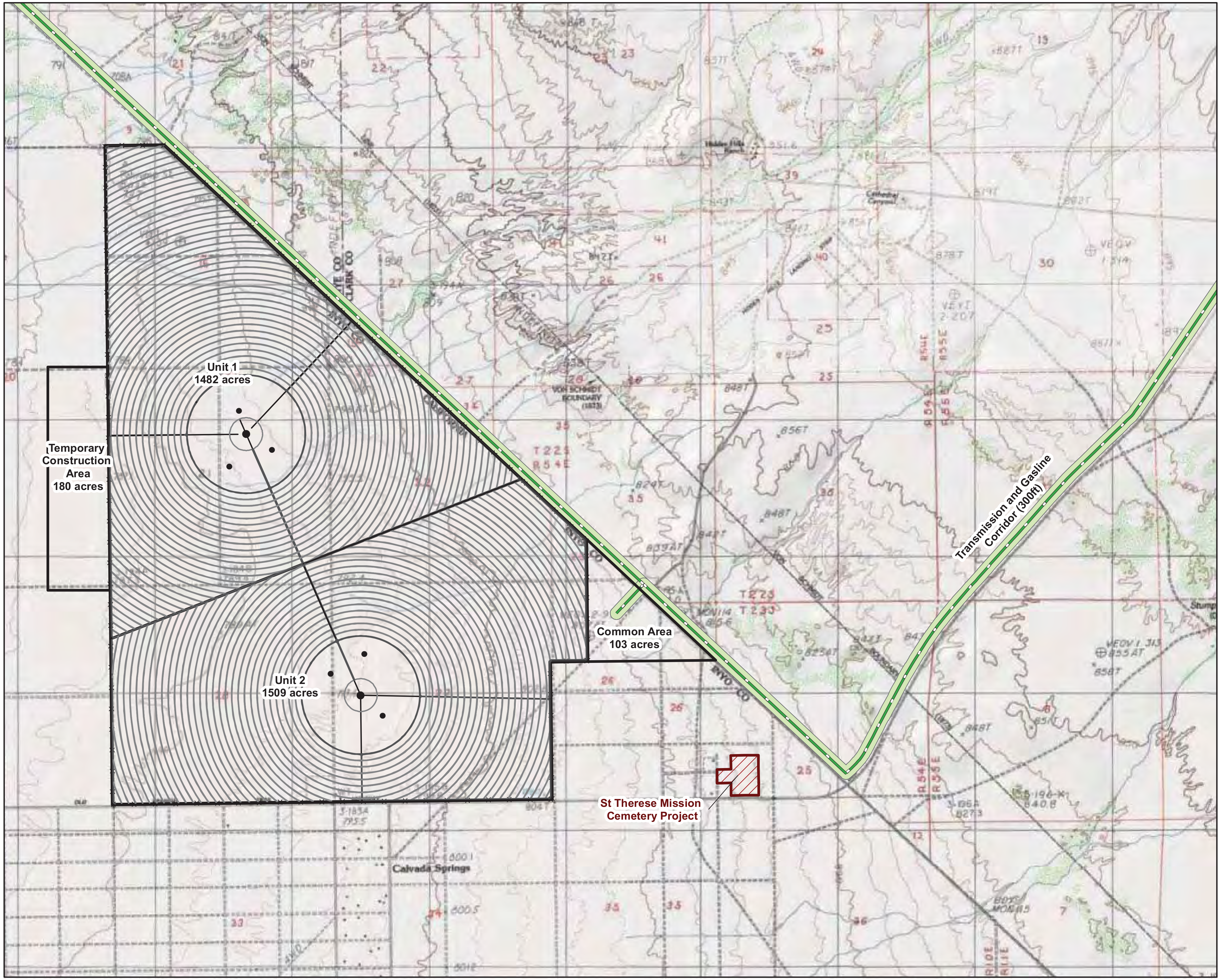
Sincerely,

Nancy Matthews

Nancy Matthews

Attachment

cc: Clay Jensen, BrightSource Energy
Susan Strachan, Strachan Consulting
Jan Sudomier, GBUAPCD



VICINITY MAP

LEGEND

- ● Solar Towers
- • Solar Field Points
- ×—× Project Site Fence
- — Solar Field Paths
- — Access Roads
- — Survey Corridor (300ft)
- 🟩 Survey Corridor (300ft)
- ▨ St Therese Mission Cemetery Project
- ☐ Project Boundary

Notes:
1. Area of interest subject to change.

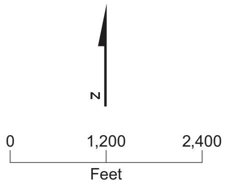


Figure 1
Hidden Hills Site and Propsed Transmission Lines
Hidden Hills

From: larry kennedy <lakenned@ndep.nv.gov>
Sent: Monday, July 11, 2011 9:24 AM
To: Nancy L. Matthews; Jan Sudomier
Subject: RE: Pahrump Area Query - solar thermal project in Inyo Co
Attachments: Sierra Research Query.xlsx; solar thermal project for southern Inyo County, CA

Jan & Nancy, pls let us know if you have any questions. Unfortunately we're having some issues with our GIS & couldn't do a simply geographic query.

Larry

From: Patrick Anderson
Sent: Tuesday, July 05, 2011 11:26 AM
To: 'nmatthews@sierraresearch.com'
Cc: larry kennedy
Subject: Pahrump Area Query - solar thermal project

Attached is a list of active permits in the Pahrump Valley Hydrographic Basin #162. If any of these interest you in greater detail, let me know and I will attempt to answer your questions. For clarification, a SAD is a Surface Area Disturbance permit for dust control; a Class 2 is a stationary minor source; and a Class 3 is a stationary minor source subject to a facility-wide 5 tpy cumulative emissions cap for all pollutants. Hope this helps – good luck!

FIN	Fac. Seq.	Company Name	Issue Date	Class	Facility ID	Facility Name	Basin	Section	Township	North/South	Range	County
A0475	0519	WULFENSTEIN CONSTRUCTION CO, INC	7/9/06	2	AP16110519.02	CLASS 2 - BLM PIT	162	29	20	S	54E	NY
A0181	0890	JOE'S HAULING, LLC	7/7/09	2	AP14420890.02	SAD -AVE OF THE STARS & SR160, PAHRUMP	162	35	19	S	53E	NY
A0205	0923	WULFCO, LLC	1/26/10	2	AP16290923.02	SAD - WULFENSTEIN COMM. DEV PROJECT	162	33	20	S	54E	NY
A0216	1085	WULFENSTEIN CONSTRUCTION CO, INC	1/20/11	2	AP16291085.02	SAD -BLM PIT, 3 MI. S. OF PAHRUMP	162	29	20	S	54E	NY
A0098	1094	ERLANDSON TRANSPORTATION, INC.	7/20/06	3	AP14421094.01	CLASS 3	162	29	20	S	54E	NY
A0226	1135	NYE CTY DEPT OF PUBLIC WORKS	8/23/06	2	AP49531135.01	SAD -PAHRUMP LANDFILL	162	02	20	S	53E	NY
A0235	1171	WULFENSTEIN CONSTRUCTION CO, INC	12/21/06	2	AP14421171.01	SAD -INDUSTRIAL PIT	162	24	20	S	53E	NY
A0236	1172	WULFENSTEIN CONSTRUCTION CO, INC	12/21/06	2	AP14421172.01	SAD -NORTH PAHRUMP PIT	162	05	19	S	53E	NY
A0237	1173	WULFENSTEIN CONSTRUCTION CO, INC	12/21/06	2	AP14421173.01	SAD -BELL VISTA PIT	162	25	19	S	53E	NY
A0238	1174	WULFENSTEIN CONSTRUCTION CO, INC	12/21/06	2	AP14421174.01	SAD -GAMEBIRD PIT	162	03	21	S	54E	NY
A0240	1180	NYE CTY. DEPT. OF PUBLIC WORKS	1/31/07	2	AP16291180.01	SAD -BASIN PIT	162	18	20	S	54E	NY
A0241	1181	NYE CTY. DEPT. OF PUBLIC WORKS	1/31/07	2	AP16291181.01	SAD -WHEELER PASS PIT	162	28	20	S	54E	NY
A0249	1213	WULFENSTEIN CONSTRUCTION CO, INC	5/21/07	2	AP16291213.01	SAD -CHARLESTON RV PARK	162	24	20	S	53E	NY
A0264	1256	MOUNTAIN FALLS, LLC	10/31/07	2	AP16291256.01	SAD -MOUNTAIN FALLS, PAHRUMP	162	03	21	S	54E	NY
A0123	1355	SILVER STATE MATERIALS, LLC	10/9/08	3	AP16111355	CLASS 3 - DBA CALPORTLAND COMPANY	162	13	20	S	53E	NY
A0442	1408	WULFENSTEIN CONSTRUCTION CO, INC.	5/18/09	2	AP14421408.01	CLASS 2 - GAMEBIRD PIT	162	03	21	S	54E	NY
A0325	1484	PLEASANTON VALLEY, LLC	12/1/09	2	AP16291484.01	SAD -RICHLAND ESTATES, PAHRUMP	162	15	19	S	53E	NY
A0111	1501	PAHRUMP VALLEY GRAVEL	1/27/10	3	AP14421501.01	CLASS 3 -MESQUITE PIT	162	02	20	S	53E	NY
A0333	1510	BEAZER HOMES NEVADA	2/25/10	2	AP16291510.01	SAD - BURSON RANCH DEVELOPMENT	162	07	21	S	54E	NY
A0250	1553	WULFENSTEIN CONSTRUCTION COMPANY, INC.	10/17/10	2	AP14421553.01	CLASS 2 - WHEELER PIT, PAHRUMP	162	13	20	S	53E	NY
A0725	2182	WF DEVELOPMENT, LLC	7/19/06	2	AP16292182	SAD - PARADISO VILLAS @ MOUNTAIN FALLS	162	04	21	S	54E	NY
A0853	2355	WULFENSTEIN CONSTRUCTION	8/23/07	3	AP32732355	CLASS 3 - BASIN AVE. & PANORAMA ROAD	162	11	20	S	53E	NY
A0121	2466	SERVICE ROCK PRODUCTS	7/8/08	3	AP16112466	CLASS 3	162	12	20	S	53E	NY
A0965	2491	AWESOME CONSTRUCTION, LLC	9/12/08	2	AP16292491	SAD	162	29	20	S	54E	NY
A0109	2547	NEVADA QUALITY ROCK	8/5/09	3	AP14422547	CLASS 3	162	02	20	S	53E	NY
A1023	2562	VERIZON WIRELESS LLC	6/18/09	3	AP48122562	CLASS 3 - PAHRUMP CELL SITE	162	33	20	S	53E	NY
A1080	2635	ALBERTSON AND SONS SAND & GRAVEL	1/8/10	2	AP14422635	SAD	162	29	20	S	54E	NY
A0446	2695	SOUTHSIDE SAND & GRAVEL	7/8/10	3	AP14422695	CLASS 3	162	28	20	S	54E	NY
A1131	2700	MORALES CONSTRUCTION INC	8/26/10	2	AP14422700	CLASS 2 - MORALES GRAVEL PIT	162	29	20	S	54E	NY
A0116	2718	FLOYD'S CONSTRUCTION, INC.	9/8/10	3	AP14422718	CLASS 3 - SHAMROCK PIT	162	11	20	S	53E	NY
A1182	2730	AFFORDABLE CONCEPTS, INC.	9/9/10	2	AP15422730	SAD - MANSE ELEMENTARY SCHOOL	162	21	19	S	53E	NY
A1187	2736	FREHNER CONSTRUCTION CO.	9/12/10	2	AP16112736	SAD - GAMEBIRD ROAD	162	01	21	S	53E	NY
A1193	2748	NYE COUNTY EMERGENCY SERVICES	10/19/10	2	AP16292748	SAD - M.P. TRAINING SITE	162	01	20	S	53E	NY
A1202	2759	CORE CONSTRUCTION SERVICES OF NEVADA INC	11/23/10	2	AP15422759	SAD - PAHRUMP VALLEY H.S. PROJECT	162	22	20	S	53E	NY

SAD is a Surface Area Disturbance permit for dust control

Class 2 is a stationary minor source

Class 3 is a stationary minor source subject to a facility-wide 5 tpy cumulative emissions cap for all pollutants

Nye County Facilities Evaluated for Potential Cumulative Impacts

1. Sort by issue date ; eliminate any issued before 1/1/2010

2. Eliminate all Class 3 permits as emissions are below the 5 tpy threshold

3. Use Earthpoint Township/Range/Section overlay on Google Earth and Google Earth measuring tool to determine distances between facility location and HHSEGS property boundary. Nearest facilities to HHSEGS are in Township 21. Distances to those two facilities (Beazer Homes Nevada and Frehner Construction Co) are 8.7 and 10.0 miles, respectively—over 6 miles from property boundary. Since all other facilities are farther away, none of the listed facilities is within the 6 mile criterion for further evaluation.

FIN	Fac. Seq.	Company Name	Issue Date	Class	Facility ID	Facility Name	Basin	Section	Township	North/South	Range	County	Distance to HHSEGS Boundary (mi)
A0216	1085	WULFENSTEIN CONSTRUCTION CO, INC	1/20/11	2	AP16291085.02	SAD -BLM PIT, 3 MI. S. OF PAHRUMP	162	29	20	S	54E	NY	
A1202	2759	CORE CONSTRUCTION SERVICES OF NEVADA INC	11/23/10	2	AP15422759	SAD - PAHRUMP VALLEY H.S. PROJECT	162	22	20	S	53E	NY	
A1193	2748	NYE COUNTY EMERGENCY SERVICES	10/19/10	2	AP16292748	SAD - M.P. TRAINING SITE	162	01	20	S	53E	NY	
A1187	2736	FREHNER CONSTRUCTION CO.	9/12/10	2	AP16112736	SAD - GAMEBIRD ROAD	162	01	21	S	53E	NY	9.96
A1182	2730	AFFORDABLE CONCEPTS, INC.	9/9/10	2	AP15422730	SAD - MANSE ELEMENTARY SCHOOL	162	21	19	S	53E	NY	
A0116	2718	FLOYD'S CONSTRUCTION, INC.	9/8/10	3	AP14422718	CLASS 3 - SHAMROCK PIT	162	11	20	S	53E	NY	
A0446	2695	SOUTHSIDE SAND & GRAVEL	7/8/10	3	AP14422695	CLASS 3	162	28	20	S	54E	NY	
A0333	1510	BEAZER HOMES NEVADA	2/25/10	2	AP16291510.01	SAD - BURSON RANCH DEVELOPMENT	162	07	21	S	54E	NY	8.66
A0111	1501	PAHRUMP VALLEY GRAVEL	1/27/10	3	AP14421501.01	CLASS 3 -MESQUITE PIT	162	02	20	S	53E	NY	
A0205	0923	WULFCO, LLC	1/26/10	2	AP16290923.02	SAD - WULFENSTEIN COMM. DEV PROJECT	162	33	20	S	54E	NY	
A1080	2635	ALBERTSON AND SONS SAND & GRAVEL	1/8/10	2	AP14422635	SAD	162	29	20	S	54E	NY	
	SAD is a Surface Area Disturbance permit for dust control												
	Class 2 is a stationary minor source												
	Class 3 is a stationary minor source subject to a facility-wide 5 tpy cumulative emissions cap for all pollutants												

sierra
research

1801 J Street
Sacramento, CA 95811
Tel: (916) 444-6666
Fax: (916) 444-8373
Ann Arbor, MI
Tel: (734) 761-6666
Fax: (734) 761-6755

June 2, 2011

Mr. Lewis Wallenmeyer, Director
Clark County Department of Air Quality and Environmental Management
500 S Grand Central Pkwy.
Las Vegas, NV 89155-5210

Re: Cumulative Impacts Analysis
BrightSource Energy Hidden Hills Solar Electric Generating Facility

Dear Mr. Wallenmeyer:

BrightSource Energy (BSE) is proposing to construct a 500 MW solar thermal power plant in southern Inyo County, California, along the California-Nevada state line. A map showing the location of the proposed project is attached. BSE will be submitting an application for a Determination of Compliance to the Great Basin Unified Air Pollution Control District and an Application for Certification to the California Energy Commission for the Hidden Hills Solar Electric Generation Facility in July of this year. As part of the project review, the CEC requires BSE to prepare an analysis of the project's cumulative air quality impacts. This is defined by the CEC as "a cumulative air quality modeling impacts analysis of the project's typical operating mode in combination with other stationary source emissions sources **within a six-mile radius** *which have received construction permits but are not yet operating, or are in the permitting process*." [Emphasis added.] We have interpreted this as follows:

- Projects for which permits to construct have been issued since January 1, 2010; and
- Projects for which permits to construct have not been issued, but are reasonably foreseeable.

We would like to obtain from DAQEM a list of projects in Clark County located within six miles of the new power plant location for which permits to construct have been issued since January 1, 2010, and for which permits to construct have not been issued, but are reasonably foreseeable, along with sufficient emissions information and stack parameters so that we can include these sources in our air quality modeling. Facilities that meet these criteria but emit only VOCs can be excluded.

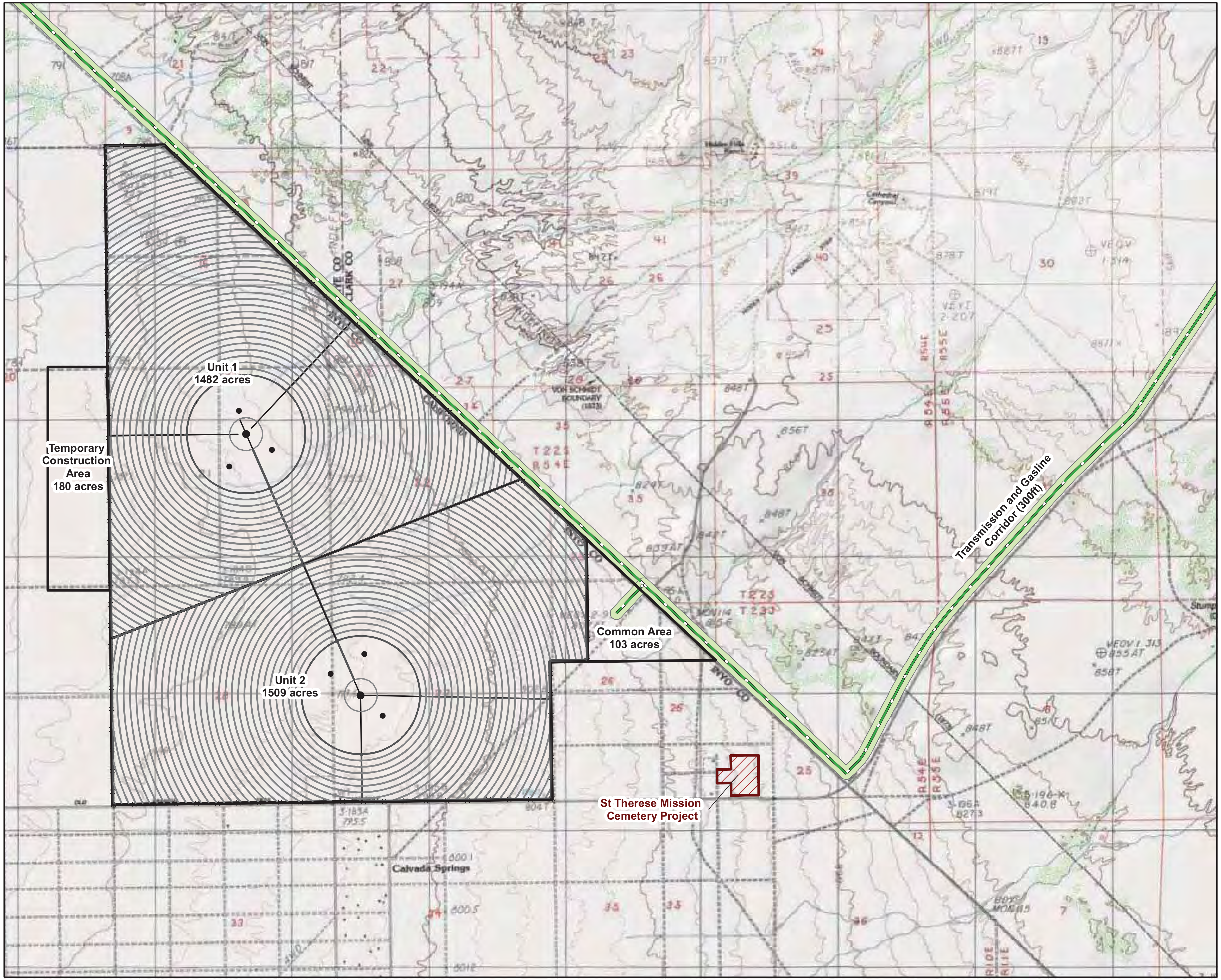
Thank you very much for your assistance. If you have any questions regarding the information we are requesting, feel free to call.

Sincerely,

Nancy Matthews
Nancy Matthews

Attachment

cc: Clay Jensen, BrightSource Energy
Susan Strachan, Strachan Consulting
Jan Sudomier, GBUAPCD



VICINITY MAP

LEGEND

- ● Solar Towers
- • Solar Field Points
- ×—× Project Site Fence
- — Solar Field Paths
- — Access Roads
- 🟩 Survey Corridor (300ft)
- 🟩 Survey Corridor (300ft)
- ▨ St Therese Mission Cemetery Project
- ☐ Project Boundary

Notes:
1. Area of interest subject to change.

N

0 1,200 2,400
Feet

Figure 1
Hidden Hills Site and Propsed Transmission Lines
Hidden Hills

SAC \\ZION\SACGIS\PROJ\SOLARPROJECTS\HIDDENHILLS\MAPFILES\2011_HIDDENHILLS\HIDDENHILLS_SITE.PDF.MXD SSCOPES 4/13/2011 4:20:48 PM

CH2MHILL

Nancy L. Matthews

From: Lewis Wallenmeyer <Wallenmeyer@ClarkCountyNV.gov>
Sent: Thursday, June 02, 2011 11:25 AM
To: Nancy L. Matthews
Cc: Jan Sudomier; Tina Gingras; Dennis Ransel; Richard Beckstead
Subject: RE: solar thermal project for southern Inyo County, CA

Thank you for your letter. We will conduct a review and prepare a letter of response to you.

Lewis

Lewis Wallenmeyer
Director
Department of Air Quality and Environmental Management
Clark County
500 S. Grand Central Parkway
P.O. Box 555210
Las Vegas, NV 89155-5210
(702) 455-1600
visit us at: www.clarkcountynv.gov

From: Nancy L. Matthews [mailto:NMatthews@sierraresearch.com]
Sent: Thursday, June 02, 2011 10:47 AM
To: Lewis Wallenmeyer
Cc: Nancy L. Matthews; Jan Sudomier
Subject: solar thermal project for southern Inyo County, CA

Dear Mr. Wallenmeyer—

As Jan Sudomier of the Great Basin Unified APCD indicated last week, a solar project is proposed for development in the Charleston View / Calvada Springs area in the south east corner of Inyo County (near Pahrump). Attached is a letter requesting information regarding other development in the project area.

Thank you very much for your assistance. If you have any questions regarding the information we are requesting, please do not hesitate to call or email me.

Nancy Matthews
916-273-5124

Nancy L. Matthews

From:	Lewis Wallenmeyer <Wallenmeyer@ClarkCountyNV.gov>
Sent:	Thursday, June 02, 2011 11:25 AM
To:	Nancy L. Matthews
Cc:	Jan Sudomier; Tina Gingras; Dennis Ransel; Richard Beckstead
Subject:	RE: solar thermal project for southern Inyo County, CA

Thank you for your letter. We will conduct a review and prepare a letter of response to you.

Lewis

Lewis Wallenmeyer
Director
Department of Air Quality and Environmental Management
Clark County
500 S. Grand Central Parkway
P.O. Box 555210
Las Vegas, NV 89155-5210
(702) 455-1600
visit us at: www.clarkcountynv.gov

From: Nancy L. Matthews [mailto:NMatthews@sierraresearch.com]
Sent: Thursday, June 02, 2011 10:47 AM
To: Lewis Wallenmeyer
Cc: Nancy L. Matthews; Jan Sudomier
Subject: solar thermal project for southern Inyo County, CA

Dear Mr. Wallenmeyer—

As Jan Sudomier of the Great Basin Unified APCD indicated last week, a solar project is proposed for development in the Charleston View / Calvada Springs area in the south east corner of Inyo County (near Pahrump). Attached is a letter requesting information regarding other development in the project area.

Thank you very much for your assistance. If you have any questions regarding the information we are requesting, please do not hesitate to call or email me.

Nancy Matthews
916-273-5124

AFC Section 5.9, Public Health
(Revised April 2012)

5.9 Public Health

5.9.1 Introduction

The Hidden Hills Solar Electric Generating System (HHSEGS) will be located on privately owned land in Inyo County, California, adjacent to the Nevada border. It will comprise two solar fields and associated facilities: the northern solar plant (Solar Plant 1) and the southern solar plant (Solar Plant 2). Each solar plant will generate 270 megawatts (MW) gross (250 MW net), for a total net output of 500 MW. Solar Plant 1 will occupy approximately 1,483 acres (or 2.3 square miles), and Solar Plant 2 will occupy approximately 1,510 acres (or 2.4 square miles). A 103-acre common area will be established on the southeastern corner of the site to accommodate an administration, warehouse, and maintenance complex, and an onsite switchyard. A temporary construction laydown and parking area on the west side of the site will occupy approximately 180 acres.

Each solar plant will use heliostats—elevated mirrors guided by a tracking system mounted on a pylon—to focus the sun's rays on a solar receiver steam generator (SRSG) atop a solar power tower near the center of each solar field. The solar power tower technology for the HHSEGS project design incorporates an important technology advancement, the 750-foot-tall solar power tower. One principle advantage of the HHSEGS solar power tower design is that it results in more efficient land use and greater power generation. The new, higher, 750-foot solar power tower allows the heliostat rows to be placed closer together, with the mirrors at a steeper angle. This substantially reduces mirror shading and allows more heliostats to be placed per acre. More megawatts can be generated per acre and the design is more efficient overall.

In each solar plant, one Rankine-cycle steam turbine will receive steam from the SRSG (or solar boiler) to generate electricity. The solar field and power generation equipment will start each morning after sunrise and, unless augmented, will shut down when insolation drops below the level required to keep the turbine online. Each solar plant will include a natural-gas-fired auxiliary boiler, used to pre-warm the SRSG to minimize the amount of time required for startup each morning, to assist during shutdown cooling operation, and to augment the solar operation when solar energy diminishes, as well as a nighttime preservation boiler, used to maintain system temperatures overnight. On an annual basis heat input from natural gas will be limited by fuel use and other conditions to less than 10 percent of the heat input from the sun. To save water in the site's desert environment, each solar plant will use a dry-cooling condenser. Cooling will be provided by air-cooled condensers, supplemented by a partial dry-cooling system for auxiliary equipment cooling. Raw water will be drawn daily from onsite wells located in each power block and at the administration complex. Groundwater will be treated in an onsite treatment system for use as boiler make-up water and to wash the heliostats.

Deleted: or during transient cloudy conditions, a startup boiler, used during the morning startup cycle, and

Two distinct transmission options are being considered because of a unique situation concerning Valley Electric Association (VEA). Under the first option, the project would interconnect via a 230-kilovolt (kV) transmission line to a new VEA-owned substation (Tap Substation) at the intersection of Tecopa Road[1] and Nevada State Route (SR) 160

---

[1] The road is also called Tecopa Highway and Old Spanish Trail Highway. The names are generally used interchangeably.

(the Tecopa/SR 160 Option). The other option is a 500-kV transmission line that interconnects to the electric grid at the Eldorado Substation (the Eldorado Option), in Boulder City, Nevada.

A 12- to 16-inch-diameter natural gas pipeline will be required for the project. It will exit the HHSEGS site at the California-Nevada border and travel on the Nevada side southeast along the state line, then northeast along Tecopa Road until it crosses under SR 160. From this location a 36-inch line will turn southeast and continue approximately 26 miles, following the proposed Eldorado Option transmission line corridor, to intersect with the Kern River Gas Transmission (KRGT) pipeline. A tap station will be constructed at that point to connect it to the KRGT line. The total length of the natural gas pipeline will be approximately 35.3 miles.

The transmission and natural gas pipeline alignments will be located in Nevada, primarily on federal land managed by the U.S. Bureau of Land Management (BLM), except for small segments of the transmission line (both options) in the vicinity of the Eldorado Substation, which is located within the city limits of Boulder City, Nevada. A detailed environmental impact analysis of the transmission and natural gas pipeline alignments will be prepared by BLM.

This section presents the methodology and results of a human health risk assessment (HRA) performed to assess potential impacts and public exposure associated with airborne emissions from HHSEGS construction and operation. This screening HRA has been performed in accordance with guidance established by the California Office of Environmental Health Hazard Assessment (OEHHA, 2003) and the California Air Resources Board (CARB, 2010). Beneficial aspects of the project regarding protection of public health include the following:

- Use of solar technology to generate electricity with minimal use of fossil fuel
- Use of clean-burning, low sulfur content natural gas for support equipment, which reduces sulfur dioxide (SO_2) emissions and subsequent sulfate fine particulate generation
- Optimized stack height to reduce ground-level concentrations of exhaust pollutants below public health-related significance thresholds

These features will ensure that the public health impacts of the project will be avoided or minimized.

HHSEGS will not be a major stationary source under Great Basin Unified Air Pollution Control District (GBUAPCD) New Source Review (NSR) regulations because maximum facility emissions of each criteria pollutant will be below 250 pounds per day. The project will not be a major source under the federal Prevention of Deterioration (PSD) program because it will have the potential to emit less than 100 tons per year (tpy) of each PSD criteria pollutant, and less than 100,000 tons per year of greenhouse gases (GHG).

Air will be the dominant pathway for potential public exposure to non-criteria pollutants released by the project. Emissions to the air will consist primarily of combustion by-products produced by the boilers and emergency engines. Potential health risks from combustion emissions will occur almost entirely by direct inhalation. To be conservative, additional pathways for dermal absorption, soil ingestion, and mother's milk ingestion were included in the health risk modeling; however, direct inhalation is the dominant exposure pathway. Consistent with OEHHA guidance, because of the remote desert location of the proposed project, the produce and fish pathways were not evaluated.[2]

Combustion byproducts with established national and California ambient air quality standards (referred to as "criteria pollutants") are addressed in Section 5.1, Air Quality. Some discussion of the potential health risks associated with these substances is also presented in this section. Potential public exposure to accidental releases of hazardous materials on the project site during operation is addressed in Section 5.14, Hazardous Materials Handling. To ensure worker safety during operations and construction, safe work practices will be followed (see Section 5.16, Worker Health and Safety).

The details of the public health analysis are contained in the following sections. Section 5.9.2 describes the laws, ordinances, regulations, and standards (LORS) relevant to potential public health impacts of such a project. Section 5.9.3 describes the potentially affected public health environment around the project site. Section 5.9.4 discusses the environmental impacts from construction and operation of the power plant and associated facilities. Section 5.9.5 discusses potential cumulative public health impacts of the combined toxic air contaminant (TAC[3]) emissions from the project and other projects, if any, in the process of obtaining permits to construct or reasonably known by GBUAPCD or other local air permitting agencies to be entering the permitting process. These other projects are also considered in the cumulative impacts analysis (Section 5.9.5 and Air Quality Appendix 5.1G). Section 5.9.6 discusses mitigation measures that may be needed to reduce potentially significant impacts below a level of significance. Section 5.9.7 provides the agencies involved in public health aspects of permitting and the California Environmental Quality Act (CEQA) analysis for the project, along with agency contact information. Section 5.9.8 describes public health-related permits for the project, and the schedule for obtaining those permits. Section 5.9.9 provides the references cited or consulted in preparing this section.

5.9.2 Laws, Ordinances, Regulations and Standards

An overview of the regulatory process for public health issues is presented in this section. Table 5.9-1 identifies the relevant LORS that affect public health and are applicable to this project. The compliance of HHSEGS with each of the LORS applicable to public health is also presented in this table.

---

[2] "*The other exposure pathways (e.g., the ingestion of homegrown produce or fish) are evaluated on a site-by-site basis. If the resident can be exposed through an impacted exposure pathway, then it must be included in the HRA.* ***However, if there were no vegetable gardens or fruit trees within the zone of impact for a facility, for example, then the produce pathways would not be evaluated.***" [emphasis added) Source: OEHHA, 2003.

[3] Also called non-criteria pollutants.

TABLE 5.9-1
Laws, Ordinances, Regulations, and Standards Applicable to Public Health

LORS	Requirements/ Applicability	Administering Agency	AFC Section Explaining Conformance
Federal			
Clean Air Act	Requires large facilities to provide offsets and demonstrate that new emissions will not cause or contribute to violation of a federal ambient air quality standard	U.S. Environmental Protection Agency (EPA) Region 9, CARB, and GBUAPCD	Section 5.9.2.1
40 Code of Federal Regulations (CFR) Part 68 (Risk Management Plan)	Requires facilities storing or handling significant amounts of acutely hazardous materials to prepare and submit Risk Management Plans	EPA Region 9 and Inyo County Environmental Health Department	Section 5.9.2.1
State			
Health and Safety Code 25249.5 et seq. (Safe Drinking Water and Toxic Enforcement Act of 1986—Proposition 65)	Activities resulting in doses or carcinogenic risks above specified thresholds require Proposition 65 exposure warnings.	CA OEHHA	Section 5.9.2.2
Health and Safety Code, Article 2, Chapter 6.95, Sections 25531 to 25541; California Code of Regulations (CCR) Title 19 (Public Safety), Division 2 (Office of Emergency Services), Chapter 4.5 (California Accidental Release Prevention Program)	Requires facilities storing or handling significant amounts of acutely hazardous materials to prepare and submit Risk Management Plans	Inyo County Environmental Health Department	Section 5.9.2.2
Health and Safety Code Sections 44360 to 44366 (Air Toxics "Hot Spots" Information and Assessment Act—AB 2588)	Requires preparation and biennial updating of facility emission inventory of hazardous substances; risk assessments.	GBUAPCD and CARB	Section 5.9.2.2
Local			
GBUAPCD Rule 220, Construction or Reconstruction of Major Sources of Hazardous Air Pollutants	Requires the evaluation of the potential impact of TACs from new sources and modifications.	GBUAPCD	Section 5.9.2.3

5.9.2.1 Federal LORS

5.9.2.1.1 Clean Air Act

The Clean Air Act requires large projects (new or modified sources at major stationary sources) to go through a federal permitting process that ensures that the project will not cause or contribute to a violation of a national ambient air quality standard. The emissions from HHSEGS are below the thresholds for applicability of the federal permitting requirements.

5.9.2.1.2 40 CFR Part 68 (Risk Management Plan)

Facilities storing or handling significant amounts of acutely hazardous materials are required to prepare and submit risk management plans. No regulated substance will be present in quantities exceeding the applicability thresholds. A Risk Management Plan (RMP) is not required.

5.9.2.2 State LORS

5.9.2.2.1 Health and Safety Code 25249.5 et seq. (Safe Drinking Water and Toxic Enforcement Act of 1986—Proposition 65)

Activities which expose the public to significant levels of chemicals that are carcinogenic or that can cause reproductive harm must provide warnings.

Based on an HRA that follows CARB/CA OEHHA guidelines, non-criteria pollutant emission rates and resulting doses and carcinogenic risks will not exceed thresholds that require Proposition 65 exposure warnings.

5.9.2.2.2 Health and Safety Code, Article 2, Chapter 6.95, Sections 25531 to 25541; CCR Title 19 (Public Safety), Division 2 (Office of Emergency Services), Chapter 4.5 (California Accidental Release Prevention Program)

Facilities storing or handling significant amounts of acutely hazardous materials are required to prepare and submit risk management plans.

No regulated substance will be present in quantities exceeding the applicability thresholds. An RMP is not required.

5.9.2.2.3 Health and Safety Code Sections 44360 to 44366 (Air Toxics "Hot Spots" Information and Assessment Act—AB 2588)

Under this program, facilities with emissions of toxic air contaminants are prioritized based on emissions. If the facility's priority score is high enough, the facility is required to prepare an HRA. High risk facilities may be required to provide notification to neighbors or to develop and implement a risk reduction plan.

Based on the emission estimates described in this report, HHSEGS will not be a high-priority facility.

5.9.2.3 Local LORS

5.9.2.3.1 New Source Review Requirements for Air Toxics

Deleted: **<#>Inyo County Renewable Energy Ordinance¶**
The Inyo County Renewable Energy Ordinance requires developers of renewable energy projects to apply for and obtain from the County Planning Commission a renewable energy impact determination that identifies environmental and other impacts expected to result from such projects, and mitigation for those impacts.¶
The identification of potential air quality impacts and mitigation that would be provided to the County but for the California Energy Commission's (CEC) jurisdiction over this project is provided in this Application for Certification. ¶

The GBUAPCD's Toxic Risk Assessment Policy describes the requirements and standards for evaluating the potential impact of TACs from facilities that emit TACs. The rule requires a demonstration that a new or modified source will not exceed the applicable health risk thresholds.

The GBUAPCD's NSR rule for air toxics (Regulation II, Rule 220, Construction or Reconstruction of Major Sources of Hazardous Air Pollutants) describes the requirements, procedures, and standards for evaluating the potential impact of TAC from new sources and modifications to existing sources. Based on the emissions estimates described in this report, HHSEGS is not a major source of hazardous air pollutants.[4]

5.9.3 Affected Environment

The CEC defines sensitive receptors as infants and children, the elderly, the chronically ill, and any other members of the general population who are more susceptible to the effects of exposure to environmental contaminants than the population at large. For the purposes of this analysis, sensitive receptors are defined as the locations occupied by groups of individuals who may be more susceptible to health risks from a chemical exposure: schools (public and private), day-care facilities, convalescent/nursing homes, retirement homes, health clinics, and hospitals. Because sensitive individuals may be located at any residential site, risk-based standards apply to existing residences and places where residences may be built without a change in zoning as well as sensitive receptors. If project impacts are protective of sensitive individuals at the point of maximum impact, they are protective at all locations.

Identification of sensitive receptors is typically done to ensure that notice of possible impacts is provided to the community. No daycare, hospital, park, preschool, or school receptors were found within 6 miles of the project site. The St. Therese Mission, a commercial facility, is under construction approximately 0.5 mile southeast of the HHSEGS site (see Figure 5.9-1). Because this development is planned to include a chapel, garden, restaurant, visitor center that will include a children's playground, and a residential unit, this future development will be treated as a sensitive receptor.

The nearest residence to the HHSEGS property boundary is approximately 300 feet west of the fenceline (see Figure 5.9-1). The nearest residence to any power block equipment is approximately 3,500 feet south of the Solar Plant 2 power block and about 950 feet south of the project's southern boundary.

A variety of studies have been published regarding cancer and respiratory illnesses and diseases in Inyo County and in the broader Great Basin Valleys Air Basin (GBVAB). Asthma diagnosis rates in the GBVAB area are higher than average rates throughout the state for adults and children (Wolstein et al., 2010). The percentage of adults who have been diagnosed with asthma was 9.3 percent in 2005 and 2007, compared with 7.7 percent of the population statewide. However, rates for children were 13.2 percent compared with 10.1 percent statewide for the same time period (Wolstein et al., 2010). Cancer death rates in the county have remained stable between 2003 and 2007, slightly over 200 per 100,000. However, cancer death rates in the county remain slightly higher than the statewide average of 170 per 100,000 population (National Cancer Institute, 2011). The local public health department, Inyo County Health and Human Services, provides information on its website regarding public health issues for county residents (Inyo County, 2011).

There are no ambient monitors measuring TACs in the GBVAB. However, air quality and health risk data presented by CARB in the *California Almanac of Emissions and Air Quality – 2009 Edition* (CARB, n.d.) for the upwind San Joaquin Valley Air Basin (SJVAB)[5] show that over the period 1990 through 2005, the average concentrations for the top ten TACs have

---

[4] Not all TACs are Hazardous Air Pollutants (HAPs). For example, diesel particulate matter and ammonia are TACs but are not listed federal HAPs.

[5] Air pollution transport from the SJVAB to the GBVAB is discussed in Title 17 CCR Section 75000, Transport Identification.

been substantially reduced, and the associated health risks are showing a steady downward trend as well. CARB-estimated emissions inventory values for the top ten TACs for 2008 for Inyo County and ambient levels and associated potential risks for the SJVAB are presented in Table 5.9-2 for the air basin.

TABLE 5.9-2
Top Ten TACs Emitted by All Sources in the Project Area

		2007 Levels and Risks, SJVAPCD[a]	
TAC	**2008 Emissions, Inyo County (tons/year)**	**Annual Average Concentration (ppbv)**	**Potential Health Risk[b] (in 1 million)**
Acetaldehyde	27	1.2	6
Benzene	39	0.32	29
1,3-Butadiene	12	0.07	24
Carbon tetrachloride	0	0.10 (2003)	26 (2003)
Chromium, hexavalent	<0.01	0.08 ng/m^3	12
Para-Dichlorobenzene	<1	0.15 (2006)	10 (2006)
Formaldehyde	56	2.5	18
Methylene chloride	2	0.1	<1
Perchloroethylene	2	0.03	1
Diesel PM[c]	42	1.3 μg/m^3 (2000)	390 (2000)
Total Health Risk[d]			90

[a] There are no ambient monitors in GBVAB that measure air toxics, so data from the SJVAB, which is upwind of the GBVAB, is provided as a conservative estimate of background concentrations and health risks.

[b] Health Risk represents the number of excess cancer cases per million people based on a 70-year exposure to the annual average concentration. Health risk represents only the compounds listed in this table and only those with data for the year. There may be other significant compounds for which monitoring and health risk information are not available.

[c] The diesel PM concentrations are estimates based on receptor modeling, and are available only for selected years.

[d] Total Health Risk shown excludes diesel PM because diesel PM concentrations are not available for 2007.

Notes:

μg/m^3 = micrograms per cubic meter
ng/m^3 = nanograms per cubic meter
ppbv = parts per billion by volume
SJVAPCD = San Joaquin Valley Air Pollution Control District

Source: CARB, 2009a. Tables C-1 and C-34.

5.9.4 Environmental Analysis

This public health section discusses the sources and different kinds of air emissions associated with construction and operation of the project (see Section 5.1, Air Quality), the methodology used in the HRA, and the results of the assessment of potential health risks from the project.

Project emissions to the air will consist of combustion byproducts from the natural-gas-fired boilers. Another source of combustion pollutants will be the routine testing and maintenance of the diesel-fueled emergency standby generators and the emergency fire water pump engine. Inhalation is the main pathway by which air pollutants can potentially cause public health impacts. Other pathways, including dermal absorption and ingestion of soil, homegrown vegetables, and mother's milk, are also evaluated for potential exposure. As discussed below, these health impacts will not be significant.

Construction emissions are presented in detail in Appendix 5.1F, followed by an air dispersion analysis demonstrating that with the exception of the state 24-hour PM_{10} (particulate matter smaller than 10 microns in diameter) standard (which is already being exceeded), ambient air quality standards will not be exceeded during project construction. The dominant emission with potential health risk is diesel particulate matter from combustion of diesel fuel in construction equipment (e.g., cranes, dozers, excavators, graders, front-end loaders, backhoes). A screening-type calculation in Appendix 5.1F demonstrates that the potential carcinogenic risk of diesel particulate matter emissions during construction will be less than significant.

To evaluate potential health risks during project operation, the measures of these risks are first described in terms of the types of public health effects and the significance criteria and thresholds for those effects.

5.9.4.1 Significance Criteria

Significance criteria exist for both cancer and non-cancer risks, and are discussed separately below.

5.9.4.1.1 Cancer Risk

Cancer risk is the probability or chance of contracting cancer over a human life span (assumed to be 70 years). Carcinogens are assumed to have no threshold below which there would be no human health impact. Any exposure to a carcinogen is assumed to have some probability of causing cancer: the lower the exposure, the lower the cancer risk (i.e., a linear, no-threshold model). Under state regulations, an incremental cancer risk greater than 10-in-one million due to a project is considered to be a significant impact on public health. The 10-in-one-million risk level is also used by the Air Toxics "Hot Spots" (AB 2588) program and California's Proposition 65 as the public notification level for air toxic emissions from existing sources.

Animal studies or human epidemiological studies (often based on workplace exposures) are used to estimate the relationship between the dose of a particular carcinogen and the resulting excess cancer risk. The cancer potency factor for that carcinogen is the slope of that dose-response relationship. Cancer risk is estimated by multiplying the dose of a particular carcinogen times its cancer potency factor. The dominant exposure pathway is inhalation; however, additional exposure pathways are considered in this screening HRA.

5.9.4.1.2 Non-Cancer Health Impacts

Non-cancer health effects can be either long-term (chronic) or short-term (acute). In determining potential non-cancer health risks from air toxics, it is assumed there is a dose of the TAC below which there would be no impact on human health. The air concentration corresponding to this dose is called the Reference Exposure Level (REL). A non-cancer health impact is measured in terms of a health hazard quotient for each TAC, which is the modeled maximum annual concentration of each TAC divided by its REL. Health hazard quotients for TACs affecting the same target organ are typically summed, with the resulting totals expressed as health hazard indices for each organ system. A health hazard index of less than 1.0 is considered by the regulatory agencies to be a less-than-significant health risk. For this HRA, as a conservative assumption that will tend to overpredict risk, all hazard quotients were summed regardless of target organ.

This methodology leads to a conservative (upper bound) assessment. RELs used in the hazard index calculations were those published in the CARB/CA OEHHA listing, updated as of February 14, 2011 (CARB, 2011) (see Sections 5.1.4.6 and Appendix 5.1E of Section 5.1, Air Quality).

Chronic toxicity is defined as adverse health effects from prolonged chemical exposure, caused by chemicals accumulating in the body. Because chemical accumulation to toxic levels typically occurs slowly, symptoms of chronic effects usually do not appear until long after exposure commences. The lowest no-effect chronic exposure level for a non-carcinogenic air toxic is the chronic REL. Below this threshold, the body is capable of eliminating or detoxifying the chemical rapidly enough to prevent its accumulation. The chronic health hazard index was calculated as the sum of the chronic health hazard quotients, each of which is calculated as the chronic TAC annual concentration divided by the chronic REL of the TAC.

Acute toxicity is defined as adverse health effects caused by a brief chemical exposure of no more than 24 hours. For most chemicals, the air concentration required to produce acute effects is higher than the level required to produce chronic effects because the duration of exposure is shorter. Because acute toxicity is predominantly manifested in the upper respiratory system at threshold exposures, all acute health hazard quotients are typically summed to calculate the acute health hazard index. This method leads to an upper bound assessment.

The maximum 1- and 8-hour average concentrations of each TAC with acute health effects is divided by the specific TAC's acute 1- and 8-hour REL, respectively, to obtain the 1- and 8-hour health hazard quotient for health effects caused by relatively high, short-term exposure to air toxics. RELs used in the hazard index calculations were those published in the CARB/OEHHA listing, updated February 14, 2011 (CARB, 2011). New RELs initially adopted by OEHHA on December 19, 2008, included 8-hour average RELs for acetaldehyde, acrolein and formaldehyde.[6] However, because these 8-hour RELs are not yet included in CARB's Hotspots Analysis and Reporting Program (HARP) software, they have been evaluated manually in this screening HRA.

5.9.4.2 Construction Impacts

Construction of HHSEGS, from perimeter fencing to site preparation and grading to commercial operation, is expected to take place from the third quarter of 2012 to the second quarter of 2015 (29 months total). Construction of the common area facilities would occur concurrently with the construction of Solar Plant 1; Solar Plant 2 construction will be staggered 3 months behind Solar Plant 1.

No significant public health effects are expected during construction. Strict construction practices that incorporate safety and compliance with applicable LORS will be followed. In

---

[6] Eight-hour RELs were also adopted for arsenic, manganese, and mercury. However, those chemicals are not emitted in any significant amount from natural gas-fired gas boilers, so are not included in this screening HRA.

addition, mitigation measures to reduce air emissions from construction impacts will be implemented as described in Section 5.1, Air Quality.

Temporary air emissions from construction are presented in detail in Appendix 5.1F, followed by a criteria pollutant air dispersion analysis that demonstrates ambient air quality standards will not be exceeded by construction of the project. The dominant emission with potential health risk is diesel particulate matter (DPM) from combustion of diesel fuel in construction equipment (e.g., cranes, dozers, excavators, graders, front-end loaders, backhoes). DPM emissions from on-site construction are summarized in Table 5.9-3.

TABLE 5.9-3
Maximum Onsite DPM Emissions During Construction

Emitting Activity	Pounds per Day	Tons per Year
Construction Equipment	4.4	0.1

The detailed HRA calculations in Appendix 5.1E demonstrate that the potential cancer risk of DPM emissions during project construction will not exceed the significance threshold of 10 in one million. This HRA was performed in accordance with OEHHA (2003) guidance, which requires adjusting the 70-year lifetime exposure risk for an exposure period of 9 years (despite the fact that project construction will only last 29 months). The resulting maximum off-property cancer risk would be approximately 7.4 in one million.

Ambient air modeling for PM_{10}, carbon monoxide (CO), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2) was performed as described in Section 5.1.4.5 and Appendix 5.1D. Construction-related criteria pollutant emission impacts are temporary and localized, resulting in no long-term significant health impacts to the public.[7]

Small quantities of hazardous waste may be generated during construction of the project. Hazardous waste management plans will be in place so the potential for public exposure is minimal. Refer to Section 5.14, Waste Management, for more information. No acutely hazardous materials will be used or stored onsite during construction (see Section 5.5, Hazardous Materials Handling). To ensure worker safety during construction, safe work practices will be followed (see Section 5.16, Worker Health and Safety).

5.9.4.3 Operations Impacts

Potential human health impacts associated with the project result from exposure to air emissions from operation of the natural-gas-fired boilers and diesel-fueled emergency equipment. The non-criteria pollutants emitted from the project include certain volatile organic compounds and polycyclic aromatic hydrocarbons (PAHs) from the combustion of natural gas. These pollutants are listed in Table 5.9-4, and the detailed emission summaries and calculations are presented in Appendix 5.1B.

---

[7] Modeled construction impacts presented in the revised Air Quality Section 5.1 reflect the revised results submitted in response to Staff's Data Request 8 (Set 1A), November 2011. As indicated in Footnote **Error! Bookmark not defined.** to Section 5.1, the Boiler Optimization is not expected to result in any changes to the construction schedule or loading upon which the AFC and DR8 analyses are based.

TABLE 5.9-4
Pollutants Emitted to the Air from the Project

Criteria Pollutants	Non-criteria Pollutants
Carbon monoxide	Acetaldehyde
Oxides of nitrogen	Acrolein
Particulate matter	Benzene
Oxides of sulfur	Ethylbenzene
Volatile organic compounds	Formaldehyde
	Hexane
	Naphthalene
	PAHs
	Propylene
	Toluene
	Xylene
	Diesel Particulate Matter

Emissions of criteria pollutants will not cause or contribute significantly to violations of the national or California ambient air quality standards as discussed in Section 5.1, Air Quality.

Air dispersion modeling results (see Section 5.1.4.5) show that emissions will not result in ambient concentrations of criteria pollutants that exceed the ambient air quality standards, with the exception of the state PM_{10} standard. For this pollutant, existing 24-hour average PM_{10} background concentrations already exceed ambient standards. These standards are intended to protect the general public with a wide margin of safety. Therefore, the project will not have a significant impact on public health from emissions of criteria pollutants.

The screening HRA containing potential impacts associated with emissions of non-criteria pollutants to the air from the project is presented in Appendix 5.1E. The HRA was prepared using the latest version (1.4d) of the CARB's HARP model (CARB, 2009b), the CARB February 2011 health database (CARB, 2011), and the OEHHA Hot Spots Program Guidance Manual (OEHHA, 2003).

5.9.4.4 Public Health Impact Study Methods

Emissions of non-criteria pollutants from the project were analyzed using emission factors previously approved by CARB and the U.S. Environmental Protection Agency (EPA). Air dispersion modeling combined the emissions with site-specific terrain and meteorological conditions to analyze short-term and long-term arithmetic mean concentrations in air for use in the HRA. The EPA-recommended air dispersion model, AERMOD, was used along with 5 years (2006–2010) of compatible meteorological data from the Pahrump and Henderson, Nevada, meteorological stations. The meteorological data combined surface measurements made at Pahrump and Henderson with upper air data from Elko, Nevada. Because HARP is built on a previous EPA-approved air dispersion model, Industrial Source Complex Short Term, Version 3 (ISCST3), the HARP On-Ramp (CARB, n.d.) was used to integrate the air dispersion modeling output from the required air dispersion model, AERMOD, with the risk calculations in the HARP risk module

5.9.4.4.1 Risk Analysis Method

The criteria pollutant modeling analysis was performed using the AERMOD model, the 5-year meteorological data set described above, specific receptor grids, and the stack parameters for the combustion equipment (see Section 5.1, Air Quality). The highest annual, 8-hour and 1-hour average concentrations were used to determine cancer risk and chronic health hazard index, and acute 8-hour and 1-hour health hazard indices, as appropriate. Health risks potentially associated with the estimated concentrations of pollutants in air were characterized in terms of potential lifetime cancer risk (for carcinogenic substances), or comparison with RELs for non-cancer health effects (for non-carcinogenic substances).

Health risks were evaluated for a hypothetical Maximum Exposed Individual (MEI) located at the Point of Maximum Impact (PMI) as well as risks to the MEI at residential locations (MEIR). The cancer risk to the MEI at the PMI is referred to as the Maximum Incremental Cancer Risk, or MICR. Human health risks associated with emissions from the project are unlikely to be higher at any other location than at the PMI. If there is no significant impact associated with concentrations in air at the PMI location, it is assumed to be unlikely that there would be significant impacts in any other location. Health risks were also evaluated at the nearest residence. The PMI (and thus the MICR) is not necessarily associated with actual exposure because in many cases the PMI is in an uninhabited area. Therefore, the MICR is generally higher than the cancer risk to the nearest resident. Both risks are based on 24 hours per day, 365 days per year, 70 year lifetime exposure.

Health risks are also assessed for the hypothetical Maximally Exposed Individual Worker, or MEIW, at the PMI. This assessment reflects potential workplace risks, which have a shorter duration than residential risks. Workplace risks reflect 8 hour per day, 245 days per year, 40 year exposure.

Health risks potentially associated with concentrations of carcinogenic pollutants in air were calculated as estimated excess lifetime cancer risks. The total cancer risk at any specific location is found by summing the contributions from each carcinogen.

The inhalation cancer potency factors and RELs used to characterize health risks associated with modeled concentrations in air are taken from the *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values* (CARB, 2011) and are presented in Table 5.9-5.

TABLE 5.9-5
Toxicity Values Used to Characterize Health Risks

Toxic Air Contaminant	Inhalation Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Chronic REL($\mu g/m^3$)	Acute REL ($\mu g/m^3$)
Acetaldehyde	0.010	140	470 (1-hr) 300 (8-hr)
Acrolein	—	0.35	2.5 (1-hr) 0.7 (8-hr)
Ammonia	—	200	3,200
Benzene	0.10	60	1,300
1,3-Butadiene	0.60	20	—
Ethylbenzene	0.0087	2,000	—
Formaldehyde	0.021	9	55 (1-hr) 9 (8-hr)
Hexane	—	7,000	—
Naphthalene	0.12	9.0	—
PAHs (as BaP)	3.9	—	—
Propylene	—	3,000	—
Toluene	—	300	37,000
Xylene	—	700	22,000
Diesel particulate matter	1.1	5	—

Source: CARB, 2011.

5.9.4.5 Characterization of Risks from Toxic Air Pollutants

The estimated potential maximum cancer risks for the MICR and the MEIW at the location of maximum impact (PMI), and for the MEIR, are shown in Table 5.9-6R. The maximum carcinogenic risk at any residential receptor is below the GBUAPCD's 1-in-one-million threshold triggering additional analysis and well below the CEC's 10–in-one-million threshold of significance.

Cancer risks potentially associated with the project were also assessed in terms of cancer burden. Cancer burden is a hypothetical upper-bound estimate of the additional number of cancer cases that could be associated with emissions from the project. Cancer burden is calculated as the maximum product of any potential carcinogenic risk greater than 1 in one million and the number of individuals at that risk level. Because the MICR is less than 1 in one million, the potential cancer burden is zero.

TABLE 5.9-6R
Summary of Estimated Maximum Potential Health Risks

Receptor	Carcinogenic Risk[a] (per million)	Cancer Burden	Acute Health Hazard Index		Chronic Health Hazard Index
			1-hour	8-hour	
MICR and HHIs at PMI	2.8 in one million	0	0.003	0.004	0.001
MICR and HHIs at Residential Receptors	0.5 in one million	0	0.002	0.002	0.0002
MEIW at PMI	0.4 in one million	0	n/a[b]	n/a[b]	n/a[c]
Significance Level	10	1.0	1.0	1.0	1.0

[a] Derived (OEHHA) Method used to determine significance of modeled risks.

[b] Acute analysis is always done as a single point exposure and is not affected by the type of analysis or exposure duration.

[c] The worker is assumed to be exposed at the work location for 8 hours per day, instead of 24; for 245 days per year, instead of 365; and for 40 years, instead of 70. Therefore, a 70-year-based chronic health hazard index is not applicable to a worker.

HHI = Health Hazard Index

Deleted: 0.39
Deleted: 0.004
Deleted: 0.0002
Deleted: 0.15
Deleted: <0.0001
Deleted: 0.06

The maximum potential acute non-cancer health hazard indexes for 1-hour and 8-hour exposures associated with concentrations in air are shown in Table 5.9-6R. As indicated in Table 5.9-6R, the acute non-cancer health hazard indexes for all target organs fall well below 1.0, the threshold of significance. Further description of the methodology used to calculate health risks associated with emissions to the air is presented in Appendix 5.1E.

Similarly, the maximum potential chronic non-cancer health hazard index associated with concentrations in air is also shown in Table 5.9-6R. The chronic non-cancer health hazard index also falls below 1.0, the threshold of significance.

The estimates of cancer and non-cancer risks associated with chronic or acute exposures thresholds used for regulating emissions of toxic air contaminants to the air. Historically, exposure to any level of a carcinogen has been considered to have a finite risk of inducing cancer. There is no threshold for carcinogenicity. Because risks at low levels of exposure cannot be quantified directly by either animal or epidemiological studies, mathematical models have estimated such risks by extrapolation from high to low doses. This modeling procedure is designed to provide a highly conservative estimate of cancer risks based on the most sensitive species of laboratory animal for extrapolation to humans (i.e., the assumption being that humans are as sensitive as the most sensitive animal species). Therefore, the risk is not likely to be higher than risks estimated using inhalation cancer potency factors and is most likely lower, and could even be zero (EPA, 1991).

The analysis of potential cancer risk described in this section employs methods and assumptions generally applied by regulatory agencies for this purpose. Given the importance of assuring public health, this analysis uses highly conservative methods and assumptions, meaning they tend to over-predict the potential for adverse effects. Conservative methodology and assumptions include the following:

- The analysis includes representative weather data over a period of 5 years to ensure that the least favorable conditions producing the highest ground-level concentration of power plant emissions are included. The analysis then assumes that these worst-case weather conditions, which in reality occurred only once in 5 years, will occur continuously for 70 years.
- The project is assumed to operate at hourly, daily, and annual emission conditions that produce the highest ground-level concentrations.
- The location of the highest ground-level concentration of project emissions is identified and the analysis then assumes that a sensitive individual resides at this location 24 hours a day, 7 days a week over the entire 70-year period, even though these assumptions are physically impossible.

Taken together, these methods and assumptions create a scenario that is more potentially adverse to human health than conditions that exist in the real world. For example, if the worst-case weather conditions could only occur on a winter evening but the worst-case emission rates could only occur on a summer afternoon, the analysis nonetheless assumes that these events occur at the same time. The point of using these conservative assumptions is to consciously overstate the potential impacts of the project. No one individual will experience exposures as great as those assumed for this analysis. By determining that even this highly overstated exposure will not be significant, the analysis provides a high degree of confidence that the much lower exposures that actual persons will experience will not result in any significant increase in cancer risk. In short, the analysis ensures that there will not be any significant public health impacts at any location, under any weather condition, under any operating condition.

5.9.4.6 Hazardous Materials

Hazardous materials will be used and stored at the facility. The hazardous materials stored in significant quantities onsite and descriptions of their uses are presented in Section 5.5, Hazardous Materials Handling. Use of chemicals at the project site will be in accordance with standard practices for storage and management of hazardous materials. Normal use of hazardous materials, therefore, will not result in significant impacts on public health. Best management practices will be used and mitigation measures will be in place to prevent releases. However, if an accidental release migrated offsite, potential impacts to the public could result.

The California Accidental Release Prevention (CalARP) Program regulations and 40 CFR Part 68 under the Clean Air Act establish emergency response planning requirements for acutely hazardous materials. These regulations require, among other things, preparation of a Risk Management Program (RMP), which is a comprehensive program to identify hazards and predict the areas that may be affected by a release of a program-listed hazardous material.

An RMP is not required for this facility. No regulated substance will be present in quantities exceeding the applicability thresholds.

5.9.4.7 Operation Odors

The fuels used at the HHSEGS will include natural gas and very-low-sulfur diesel fuel. Combustion contaminants will not be present at concentrations that could produce a significant odor.

5.9.4.8 Electromagnetic Field Exposure

HHSEGS will include onsite electric power-handling transformers and associated equipment, which are discussed in more detail in Section 3.0, Transmission System Engineering. Based on findings of the National Institute of Environmental Health Sciences (NIEHS, 1999), electromagnetic field exposures from the electric power generating and handling equipment and associated transmission lines would not result in a significant impact on public health. The NIEHS report to the U.S. Congress found that "the probability that EMF exposure is truly a health hazard is currently small. The weak epidemiological associations and lack of any laboratory support for these associations provide only marginal scientific support that exposure to this agent is causing any degree of harm." (NIEHS, 1999).

5.9.4.9 Summary of Impacts

Results from the HRA based on emissions modeling indicate that there will be no significant incremental public health risks from construction or operation of the HHSEGS project. Results from criteria pollutant modeling for routine operations indicate that potential ambient concentrations of NO_2, CO, SO_2, and PM_{10} would not exceed ambient air quality standards, with the exception of the state 24-hour average PM_{10} standard. For this pollutant, existing background concentrations already exceed applicable standards, while the project would not add a significant contribution. The ambient air quality standards protect public health with a margin of safety for the most sensitive subpopulations (Section 5.1).

5.9.5 Cumulative Effects

An analysis of potential cumulative air quality impacts that may result from the project and other past, present, and reasonably foreseeable projects is required by the CEQA. The Applicant submitted letters to GBVAPCD, Clark County and Nevada Bureau of Air Pollution Control requesting the following information regarding other projects that qualify for review under the cumulative air quality impact analysis:[8]

- Projects located within a 6-mile radius of the HHSEGS project site; and
- Projects issued a new Authority to Construct permit after January 1, 2010.

GBUAPCD has responded that no projects meeting these criteria have been identified, with the exception of the St. Therese Mission project (which will not be a source of TACs). Potential cumulative impacts of other development projects within 10 miles of the project site are discussed in Appendix 5.1G.

A procedure for performing the cumulative criteria pollutant impacts analysis is discussed in Appendix 5.1G. The analysis will be supplemented if additional information is received from the adjacent Nevada agencies. The cumulative criteria pollutant impact analysis determines if HHSEGS, in combination with other nearby, foreseeable projects, will cause a combined air quality impact that exceeds significance thresholds.

---

[8] Copies of the correspondence are provided in Appendix 5.1G.

In contrast with the approach used to estimate impacts for criteria pollutants, the significance thresholds developed for TACs are set sufficiently stringently so as to preclude the potential for any significant cumulative impacts. Thus, a separate cumulative impacts analysis for TACs is not required.

5.9.6 Mitigation Measures

The project has been designed to minimize TAC emissions and impacts. No additional mitigation measures are needed for the project TAC emissions because the potential air quality and public health impacts are less than significant.

5.9.7 Agencies and Agency Contacts

Table 5.9-7 provides contact information for agencies involved with public health.

TABLE 5.9-7
Agency Contacts for Public Health

Issue	Agency	Contact
Public exposure to air pollutants	EPA Region 9	Gerardo Rios EPA Region 9 75 Hawthorne Street San Francisco, CA 94105 (415) 972-3974
Public exposure to air pollutants	CARB	Mike Tollstrup Project Assessment Branch California Air Resources Board 1001 I Street Sacramento, CA 95812 (916) 323-8473
Public exposure to air pollutants	Great Basin Unified Air Pollution Control District	Duane Ono Deputy Air Pollution Control Officer GBUAPCD 157 Short Street Bishop, CA 93514 (760) 872-8211
Public exposure to chemicals known to cause cancer or reproductive toxicity	Cal-EPA, Office of Environmental Health and Hazard Assessment	Cynthia Oshita or Susan Long Office of Environmental Health Hazard Assessment 1001 I Street, Sacramento, CA 95814 (916) 445-6900
Public exposure to accidental releases of hazardous materials	EPA Region 9	Deborah Jordan EPA Region 9 75 Hawthorne Street San Francisco, CA 94105 (916) 947-4157
Public exposure to accidental releases of hazardous materials	California Office of Emergency Services	Moustafa Abou-Taleb Governor's Office of Emergency Services 3650 Schriever Avenue Mather, CA 95655 (916) 845-8741

TABLE 5.9-7
Agency Contacts for Public Health

Issue	Agency	Contact
Public exposure to accidental releases of hazardous materials	Inyo County Sheriff's Department	Lt. Jeff Hollowell Inyo County Sheriff's Department 550 South Clay Street Independence, CA 93526 (760) 878-0395

5.9.8 Permits Required and Permit Schedule

Agency-required permits related to public health are listed in Table 5.9-8, and include the GBVAPCD Final Determination of Compliance. Upon approval of the project by the CEC, GBVAPCD will issue an Authority to Construct. A Permit to Operate will be issued by the GBVAPCD after construction and commencement of operation. These requirements are discussed in detail in Section 5.1, Air Quality.

TABLE 5.9-8
Permits Required and Permit Schedule for Public Health

Permit	Agency Contact	Schedule
Determination of Compliance/ Authority to Construct/ Permit to Operate	Duane Ono Deputy Air Pollution Control Officer GBUAPCD 157 Short Street Bishop, CA 93514 (760) 872-8211	District will issue a Preliminary Determination of Compliance within 180 days after issuing the Application Completeness Determination Letter.

5.9.9 References

California Air Resources Board (CARB). n.d. HARP Model, Version 1.4d. Available at: http://www.arb.ca.gov/toxics/harp/harp.htm.

California Air Resources Board (CARB). 2011. Consolidated Table of OEHHA/CARB Approved Risk Assessment Health Values. Updated February 14. Available at: http://arbis.arb.ca.gov/toxics/healthval/contable.pdf.

California Air Resources Board (CARB). 2010. Hot Spots Risk Assessment. Available at: http://www.arb.ca.gov/ab2588/riskassess.htm

California Air Resources Board (CARB). 2009a. *California Almanac of Emissions and Air Quality – 2009 Edition.* Available at http://www.arb.ca.gov/aqd/almanac/almanac09/almanac09.htm

California Air Resources Board (CARB). 2009b. HARP On-Ramp Version 1, accessed at http://www.arb.ca.gov/toxics/harp/downloads.htm.

National Cancer Institute. 2011. State Cancer Profiles, "Death Rate/Trend Comparison by Cancer, death years through 2007: California Counties vs. California, All Cancer Sites, All Races, Both Sexes." Available at: http://statecancerprofiles.cancer.gov/cgi-bin/ratetrendbycancer/data.pl?001&0&06&6&1&0&3

Inyo County. 2011. Health and Human Services, Public Health Department. Available at: http://www.inyocounty.us/publichealth/

National Institute of Environmental Health Sciences (NIEHS). 1999. Environmental Health Institute report concludes evidence is 'weak' that EMFs cause cancer. Press release. National Institute of Environmental Health Sciences, National Institutes of Health.

Office of Environmental Health Hazard Assessment (OEHHA). 2003. Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, California Environmental Protection Agency. August.

U.S. Environmental Protection Agency (EPA). 1991. Risk Assessment for Toxic Air Pollutants: A Citizen's Guide. EPA 450/3-90-024. March 1991. http://www.epa.gov/ttn/atw/3_90_024.html

Wolstein, Joelle, et al. 2010. "Income Disparities in Asthma Burden and Care in California," December. Accessed at http://www.healthpolicy.ucla.edu/pubs/files/asthma-burden-report-1210.pdf.

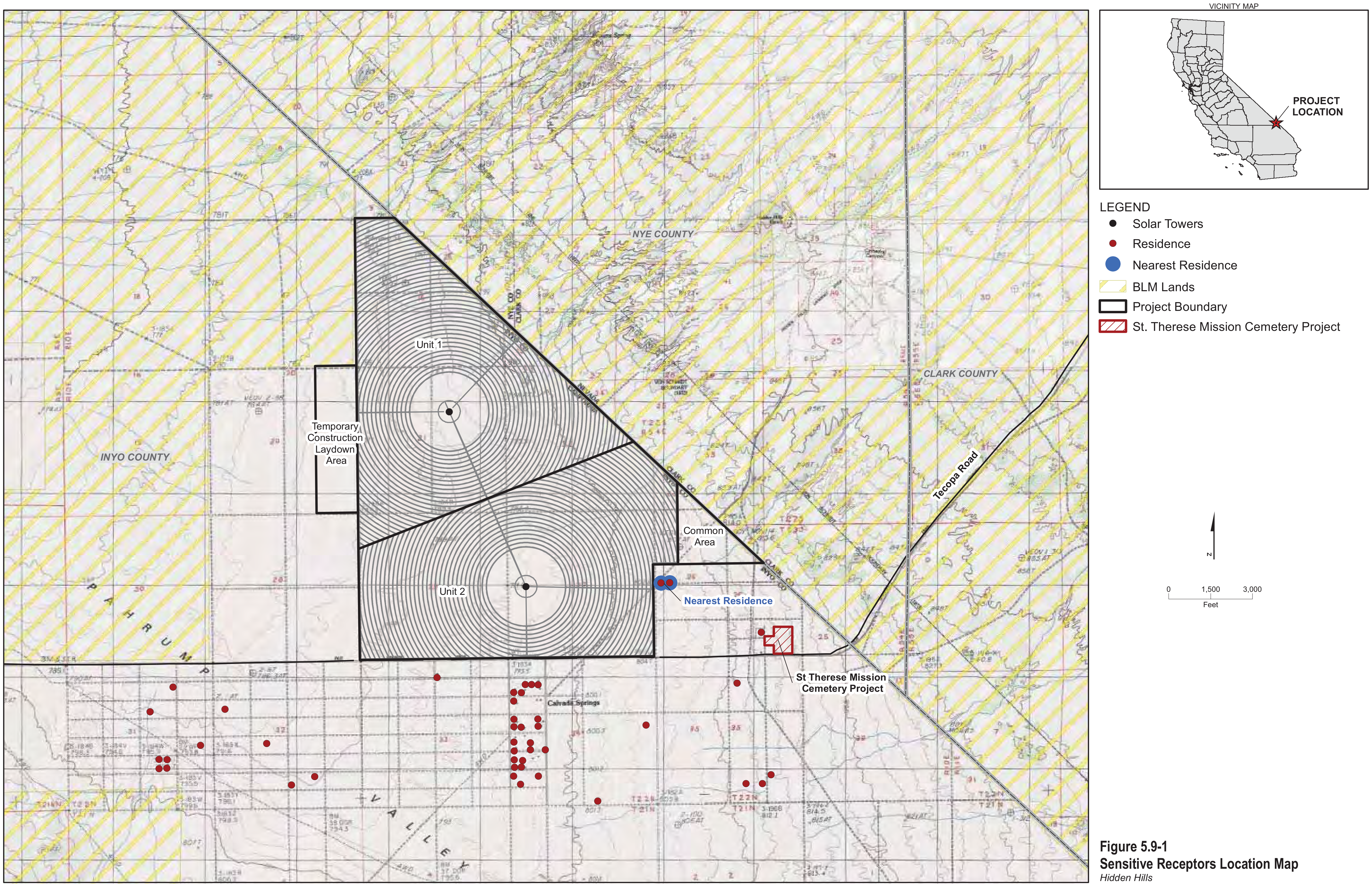


Figure 5.9-1
Sensitive Receptors Location Map
Hidden Hills

SAC \\ZION\SACGIS\PROJ\SOLARPROJECTS\HIDDENHILLS\MAPFILES\2011_HIDDENHILLS\AFC_MAPS\NOISE\SENSITIVE_RECEPTORS_PH.MXD SSCOPES 6/22/2011 4:11:27 PM