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APPLICANT'S SUPPLEMENTAL RESPONSE TO DATA REQUESTS 8 AND 16: ADDITIONAL INFORMATION REGARDING AIR QUALITY

In this section of Applicant's Supplemental Response to CEC Staff Data Requests 8 and 16, Applicant describes the changes to the Air Quality section that will result from the changes to the Project Description related to deletion of RMS Unit 3 and the boiler optimization submittal previously provided to the CEC Staff. Per staff's request, Applicant uses a strike-out/underline format to identify changes to the Air Quality section of the Application for Certification that will result from the changes to the Project Description.

The Air Quality sub-sections that have been modified are listed in the table of contents below. If there has been no change to an Air Quality sub-section relating to Applicant's Supplemental Response to Data Requests 8 and 16, the section is labeled "no changes" in the table of contents below.

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5.1 AIR QUALITY

5.1.1 Introduction (see Section 2.1.1 for updated project description)

5.1.2 Laws, Ordinance, 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. Table 5.1-1 summarizes the applicable laws, ordinances, regulations and standards (LORS) related to air quality.

Table 5.1-1
Laws, Ordinances, Regulations and Standards (LORS) (no changes)

5.1.2.1 Federal

National Environmental Policy Act (no changes)

Clean Air Act (no changes)

Clean Air Act §160-169A, 42 USC §7470-7491; 40 CFR Parts 51 and 52 - Prevention of Significant Deterioration (PSD) Program (no changes)

Table 5.1-2
PSD Significant Emission Thresholds (no changes)

Clean Air Act §171-193, 42 USC §7501 et seq.; 40 CFR Parts 51 and 52 - New Source Review (NSR) (no changes)

Clean Air Act §401 (Title IV), 42 USC §7651 - Acid Rain Program (no changes)

Clean Air Act §501 (Title V), 42 USC §7661 - Title V Operating Permits Program (no changes)

Clean Air Act §111, 42 USC §7411; 40 CFR Part 60 - National Standards of Performance for New Stationary Sources

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. The Rio Mesa SEGF will be subject to the following NSPS:

- Subpart ~~Da~~ Db, Standards of Performance for ~~Electric Utility Steam Generating Units~~ Industrial-Commercial-Institutional Steam Generating Units, is applicable to the Rio Mesa SEGF auxiliary boilers associated with the ~~three~~ two 250 MW power blocks. For natural gas fired units, Subpart ~~Da~~ Db includes the following emission limits:
  - NOx: 0.~~11~~ 0.20 lbs/MMBtu (30-day average)
  - SOx: ~~1.4 lbs/MWh~~ 0.20 lbs/MMBtu (30-day average)
  - ~~PM: 0.015 lbs/MMBtu~~
- Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, is applicable to the emergency engines and the fire pump engines. These standards are enforced at the local level with federal and state oversight.

Administering Agency: MDAQMD, with EPA Region 9 oversight.

Clean Air Act §112, 42 USC §7412 - National Emission Standards for Hazardous Air Pollutants (no changes)

Consistency with Federal Requirements (no changes)

5.1.2.2 State (no changes)

5.1.2.3 Local

When the state's air pollution statutes were reorganized in the mid-1960s, local districts were required to be established in each county of the state. There are three different types of districts: county, regional (including the MDAQMD), and unified. In addition, special air quality management district (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. Local districts have principal responsibility to do the following:

- Develop plans for meeting the NAAQS and California ambient air quality standards;
- Develop control measures for non-vehicular sources of air pollution necessary to achieve and maintain both state and federal air quality standards;
- Implement permit programs established for the construction, modification, and operation of sources of air pollution;
- Enforce air pollution statutes and regulations governing non-vehicular sources; and
- Develop programs to reduce emissions from indirect sources.

Under the regulations that govern new sources of emissions, the project is required to secure a preconstruction Determination of Compliance from the MDAQMD, as well as demonstrate continued compliance with regulatory limits when the new equipment becomes operational. The preconstruction review includes demonstrating that the new boilers will use best available control technology (BACT) and will provide any necessary emission offsets.

HSC §40914 - Mojave Desert Air Quality Plans (no changes)

HSC §4000 et seq., HSC §40200 et seq., indicated MDAQMD Rules - MDAQMD Rules and Regulations (no changes)

Authority to Construct (no changes)

Review of New or Modified Sources (no changes)

Best Available Control Technology (BACT) (no changes)

Emission Offsets (no changes)

Table 5.1-3
MDAQMD Offset Emission Thresholds (no changes)

Toxic Risk Management (no changes)

Table 5.1-4
MDAQMD Health Risk Thresholds (no changes)

CEC Review (no changes)

Prevention of Significant Deterioration (no changes)

Acid Rain Permit (no changes)

Federal Operating Permit (no changes)

New Source Performance Standards

Regulation IX Rule 900 (Standards of Performance for New Stationary Sources) adopts, by reference, the federal standards of performance for new or modified stationary sources. The NSPS for ~~Electric Utility~~ Industrial-Commercial-Institutional Steam Generation Units (40 CFR 60, Subpart ~~Da~~ Db) applies to new boilers with a maximum heat input greater than 100 MMBtu/hr ~~new large boilers (>250 MMBtu/hr~~

~~capacity) that make steam used to generate electricity~~. The applicability and requirements of the New Source Performance Standards are discussed above under the federal regulations section.

MDAQMD Prohibitory Rules (no changes)

5.1.3 Affected Environment

This section describes the regional climate and meteorological conditions that influence transport and dispersion of air pollutants and the existing air quality within the Project region. The data presented in this section are considered to be reasonably representative of the project site.

The Rio Mesa SEGF consists of the project site, linears, and a temporary laydown area (Figure 2-2, Project Features Map, Section 2.0). The project site is located in an unincorporated area of Riverside County south of Interstate 10, about 6 miles southwest of the Blythe Airport (about 13 miles southwest of downtown Blythe).

5.1.3.1 Geography and Topography (no changes)

5.1.3.2 Climate and Meteorology (no changes)

Table 5.1-5
Average Temperature and Precipitation Data at Blythe (1949-2010) (no changes)

5.1.3.3 Overview of Air Quality Standards (no changes)

Table 5.1-6
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5.1.3.4 Existing Air Quality (no changes)

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Table 5.1-12
Particulate Matter ($PM_{2.5}$) Levels at Palm Springs ($\mu g/m^3$) (no changes)

Table 5.1-13
Airborne Lead (Pb) Levels at San Bernardino ($\mu g/m^3$) (no changes)

5.1.4 Environmental Analysis

Ambient air quality impact analyses for the Project have been conducted to satisfy the MDAQMD 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. 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

Emitting Units

(See Applicant's Supplemental Response #2 to CEC Staff Data Request Set 1A, April 16, 2012, Air Quality Response Numbers 5, 8, 15, 16, and 22 and July 3, 2012 Letter to MDAQMD, enclosed as Attachment AQ-1 for discussion of emitting units).

Table 5.1-14
Natural Gas Boiler Specifications

		~~Auxiliary Boilers~~	~~Startup~~ Auxiliary Boilers	Nighttime Preservation Boilers
Make & Model		~~Rentech or equivalent~~	Rentech or equivalent	Rentech or equivalent
Fuel		~~Natural gas~~	Natural gas	Natural gas
Maximum Boiler Heat Input Rate		~~500 MMBtu/hr @ HHV~~	249 MMBtu/hr @ HHV	15 MMBtu/hr @ HHV
Steam Production Rate		~~350,000 lb/hr~~	~~185,000~~ 174,000 lb/hr	10,000 lb/hr
Stack Exhaust Temperature		~~406 °F~~	300 °F	300°F
Exhaust Flow Rate		~~167,000 acfm~~	~~74,100~~ 72,426 acfm	~~5,800~~ 4,363 acfm
Exhaust O2 Concentration, dry volume		~~3.0%~~	3.0%	3.0%
Exhaust CO2 Concentration, dry volume		~~10.2%~~	10.2%	10.2%
Exhaust Moisture Content, wet volume		~~16.3%~~	16.3%	16.3%
Emission Controls:	NOx	~~Low-NO$_x$ Burners/FGR (9.0 ppmvd NO$_x$ @ 3% O2)~~	Low-NOx Burners/FGR (9.0 ppmvd NO$_x$ @ 3% O2)	Low-NOx Burners/FGR (9.0 ppmvd NO$_x$ @ 3% O2)
	CO	~~Combustion controls (50 ppmvd @ 3% O2)~~	Combustion controls (25 ppmvd @ 3% O2)	Combustion controls (50 ppmvd @ 3% O2)
	VOC	~~Combustion controls (12.6 ppmvd @ 3% O2)~~	Combustion controls (12.6 ppmvd @ 3% O2)	Combustion controls (~~12.6~~ 10 ppmvd @ 3% O2)

Table 5.1-15
Nominal Fuel Properties—Natural Gas (no changes)

Table 5.1-16
Emergency Generator Specifications (no changes)

Table 5.1-17
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 CFP~~5~~7E-F30 or equivalent
EPA Cert	Tier 3	Tier 3
Fuel	CARB diesel	CARB Diesel
Engine Rating, bhp	200	~~125~~ 200
Fuel Consumption, gallons/hr	12	~~8~~ 12
Stack Exhaust Temperature	975°F	~~950~~975°F
Exhaust Flow Rate	1,650 acfm	~~975~~ 1,650 acfm

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 5.1-18.

Table 5.1-18
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	9	1500
Emergency Diesel Generator, Common Area	40	13	500
Diesel Fire Pumps, Power Blocks	12	46	550
Diesel Fire Pump, Common Area	~~8~~ 12	~~69~~ 46	550

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 District permitting requirements per Rule 219.E.14.c ("Unheated storage of organic materials with an initial boiling point of 300 F or greater").

Wet Surface Air Coolers (no changes)

Oil-Water Separators and Evaporators (no changes)

5.1.4.2 Facility Operations

(See Applicant's Supplemental Response #2 to CEC Staff Data Request Set 1A, April 16, 2012, Air Quality Response Numbers 5, 8, 15, 16, and 22 and July 3, 2012 Letter to MDAQMD, enclosed as Attachment AQ-1 for discussion of boiler operations)

Boiler heat inputs, as summarized in Table 5.1-14, correspond to the proposed individual unit emission limits. The daily and annual natural gas fuel use corresponding to the operating schedule described above are shown in Table 5.1-19: hourly heat input to each unit, total combined daily heat input to all units at the three plants, and total combined annual heat input to the three plants.

Emission rates and operating parameters for the boilers are shown in Appendix 5.1B, Tables 5.1B-1, B-2 and B-3. Emission rates and operating parameters for the emergency engines are shown in Appendix 5.1B, Tables 5.1B-4 and B-5. Emission rates and operating parameters for the fire pump engines are shown in Appendix 5.1B, Tables 5.1B-6 and B-7. The daily and annual fuel use levels are based on the daily/annual boiler operating hours shown in Appendix 5.1B, Table 5.1B-11.

Table 5.1-19
Maximum Facility Natural Gas Fuel Use, Boilers (MMBtu)[a]

Period	~~Auxiliary Boilers~~	~~Startup~~ Auxiliary Boilers	Nighttime Preservation Boilers	Total Fuel Use (all boilers)
Per Hour (each unit)	~~500~~	249	15	--
Per Day (total, all units)	~~18,000~~	~~1,494~~ 2,650	~~360~~ 480	~~19,854~~ 3,130
Per Year (total, all units)	~~900,000~~	~~597,600~~ 601,657	~~181,620~~ 144,698	~~1,679,220~~ 746,355

Notes:
[a] MMBtu: million Btu

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.[1] It was also assumed that as a worst case, all of the emergency generator and fire pump engines would be tested at the same time when the boilers are also operating. ~~The engines would not be tested on days when the auxiliary boilers are operating.~~Combined annual fuel use in all engines, as shown in Table 5.1-20, will be limited by permit condition.

Table 5.1-20
Maximum Facility Diesel Fuel Use, Engines (MMBtu)[a]

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)[b]	11.9	1.4	0.8	~~0.6~~ 0.8	--
Per Day (total, all units)	~~35.7~~ 23.8	1.4	~~2.4~~ 1.6	~~0.6~~ 0.8	~~40.1~~ 27.6
Per Year (total, all units)	~~14,280~~ 9,520	544	~~979~~ 653	~~218~~ 326	~~16,021~~ 11,043

Notes:
[a] MMBtu: million Btu
[b] 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

[1] For annual criteria pollutant emissions calculations, emergency engine operation was limited to 50 hours/year to match the limit in the ATCM for operation for maintenance/testing purposes. However, for the calculation of annual greenhouse gas emissions, engine emergency operations must be included (see Section 5.1.4.5.5, Greenhouse Gas Emissions).

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.

Criteria Pollutant Emissions: Combustion Equipment

The boilers, emergency engines, and Diesel fire pump engine emission rates have been calculated from data provided by the project engineering firm, 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-4 through B-7 of Appendix 5.1B.

Boiler Emissions during Normal Operations

Emissions of NOx, CO, VOC, and SOx were calculated from the heat input (in MMBtu) and emission limits (in lbs/MMBtu). The NO_x emission limit reflects the use of low-NO_x burners and flue gas recirculation. 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 5.1-14.

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 5.1-21. The ~~auxiliary and startup~~ auxiliary boilers are expected to have a 4:1 turndown ratio; the nighttime preservation boilers are expected to have a 5:1 turndown ratio. Full-load emission rates will be achieved throughout the turndown range. Emissions during other activities are discussed in more detail below.

Table 5.1-21
Maximum Hourly Emission Rates: Boilers, Normal Operations

Pollutant	ppmvd @ 3% O_2	lb/MMBtu	lb/hr
~~Auxiliary Boilers (each)~~			
~~NOx~~	~~9.0~~	~~0.011~~	~~5.5~~
~~SO2~~[a]	~~1.7~~	~~0.002~~	~~1.1~~
~~CO~~	~~50~~	~~0.037~~	~~18.7~~
~~VOC~~	~~12.6~~	~~0.0054~~	~~2.7~~

Table 5.1-21
Maximum Hourly Emission Rates: Boilers, Normal Operations

Pollutant	ppmvd @ 3% O_2	lb/MMBtu	lb/hr
~~$PM_{10}/PM_{2.5}$~~	~~n/a~~	~~0.005~~	~~2.5~~
~~Startup~~ Auxiliary Boilers (each)			
NOx	9.0	0.011	2.7
SO2[a]	1.7	0.002	0.5
CO	25	0.018	4.7
VOC	12.6	0.0054	1.3
$PM_{10}/PM_{2.5}$	n/a	0.005	1.25
Nighttime Preservation Boilers (each)			
NOx	9.0	0.011	0.17
SO2[a]	1.7	0.002	0.03
CO	50	0.037	0.55
VOC	~~12.6~~ 10	0.0054~~3~~	0.08
$PM_{10}/PM_{2.5}$	n/a	0.005	0.08

Notes:
[a] Based on maximum natural gas sulfur content of 0.75 grains/100 scf.

Auxiliary Boiler Emissions During ~~Hot/~~Warm Standby

The auxiliary boilers will operate periodically throughout the day to supply steam: in the morning for system startup during occasional cloudy conditions, in the late afternoon and early evening hours. ~~During cloudy conditions, when solar energy is not sufficient to keep the steam turbine online~~ When the auxiliary boilers are not supplying steam, they ~~auxiliary boilers~~ will be kept ~~in~~on warm ~~or hot~~ standby mode to allow them to ramp up to operating pressure within about 30 minutes. ~~In hot stand-by, a boiler is maintained at full pressure with minimum steam flow by firing at up to about 5 percent of rated heat input.~~ 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~~modes~~, combustion is less efficient and NOx, VOC, CO, and PM_{10} emission concentrations are elevated. However, hourly mass emission rates during these warming periods ~~standby modes~~ will not be higher ~~be lower~~ than full load mass emission rates because of the extremely low heat input rate. Hourly emission rates for the auxiliary boilers during ~~hot~~intermittent firing to maintain warm standby ~~are summarized in Table 5.1-22. Hourly emission rates for the boilers during warm standby operations~~ will be the same as hourly mass emissions during boiler startup, described below ~~even lower because firing will be intermittent~~.

BrightSource

Table 5.1-22
Maximum Hourly Emission Rates: Auxiliary Boilers,
Hot/Warm Standby Operations (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 ~~6~~ 5 hours to achieve permitted emission limits (at 25 percent load) after an extended period of shutdown (cold start). ~~The startup boilers may require up to 5 hours to achieve permitted limits, while t~~The nighttime preservation boilers are expected to require ~~less than 4 hours~~ only 1 hour of startup operation daily. Emissions during ~~cold~~ 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 ~~for the auxiliary and startup boilers and 10 percent of maximum hourly heat input for the nighttime preservation boilers~~). Expected hourly emissions during a cold startup of the auxiliary ~~and startup~~ boilers are shown in Table 5.1-23; startup emissions for the nighttime preservation boilers are shown in Table 5.1-24. ~~Emissions were calculated assuming that only one auxiliary or nighttime preservation boiler at each plant will be in cold startup at a time, and a boiler would require the full number of hours for startup and have the emissions shown only when other boilers are not operating and available to provide preheat steam. The startup boilers may undergo a cold startup when the nighttime preservation boilers are in operation.~~

~~A cold startup of an auxiliary boiler is expected to occur about once every 2 weeks during the summer season. Based on 4 months of expected summertime operation, a cold startup of an auxiliary boiler would occur about 8 times per year. To minimize daily emissions, the cold startup of an auxiliary boiler will be staged over a two-day period. Because the startup and nighttime preservation boilers will operate year-round, cold startups of these boilers would be expected to occur about every 4 weeks, or approximately 13 times per year.~~

Table 5.1-23
Maximum Hourly Emission Rates: Auxiliary ~~and Startup~~ Boilers, Startup Operations

Pollutant	~~ppmvd @ 3% O2~~	~~lb/MMBtu~~	~~Auxiliary Boiler lb/hr~~	~~Startup~~ Auxiliary Boiler lb/hr
NOx	~~75~~	~~0.09~~	~~5.6~~	2.~~8~~74
SO2[a]	~~1.7~~	~~0.002~~	~~0.13~~	0.07
CO	~~300~~	~~0.22~~	~~13.7~~	~~6.8~~ 4.55
VOC	~~60~~	~~0.025~~	~~1.6~~	~~0.8~~ 1.34
$PM_{10}/PM_{2.5}$	~~n/a~~	~~0.01~~	~~0.63~~	0.31

Notes:
[a] Based on maximum natural gas sulfur content of 0.75 grains/100 scf.

Table 5.1-24
Maximum Hourly Emission Rates: Nighttime Preservation Boilers, Startup Operations

Pollutant	~~ppmvd @ 3% O2~~	~~lb/MMBtu~~	lb/hr
NOx	~~70~~	~~0.084~~	~~0.13~~ 0.17
SO2[a]	~~1.7~~	~~0.002~~	~~0.003~~ 0.004
CO	~~275~~	~~0.20~~	~~0.31~~ 0.55
VOC	~~55~~	~~0.023~~	~~0.04~~ 0.08
$PM_{10}/PM_{2.5}$	~~n/a~~	~~0.01~~	0.02

Notes:
[a] Based on maximum natural gas sulfur content of 0.75 grains/100 scf.

Hourly ~~NO_x~~ mass emissions during ~~cold~~ startup of the auxiliary and ~~startup~~ nighttime preservation boilers ~~are expected to be slightly~~ will not be higher than hourly emissions during normal operation. ~~Hourly CO emissions from the startup boiler may also be higher during cold startup than during normal operation.~~

Similarly, ~~D~~during routine daily startups, emissions concentrations may be higher than those shown for normal operations in Table 5.1-21 until each boiler reaches its minimum compliant load (25 percent of rated load ~~for the auxiliary and startup boilers; 20 percent of rated load for the nighttime preservation boilers~~). However, because of the ~~shorter startup times and~~ 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 ~~these routine daily~~ startups.

Boiler Operations During Commissioning Activities (no changes)

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 gallons per minute (gpm) WSAC. Particulate emissions result from evaporation of the cooling water that drifts from the fluid cooler.

Treated well water will be used for makeup water, and the Total Dissolved Solids (TDS) level of the recirculating water is expected to be approximately 1,500 ppmw after concentration.

Details of the cooling water drift calculation for the WSACs are shown in Appendix 5.1B, Table 5.1B-9. Particulate emissions from each cooling system will be about ~~40~~ 30 pounds per year.

Criteria Pollutant Emissions: Mirror Cleaning

Mirror washing will employ a high-pressure system using treated water, by means of vehicles~~ towed trailers~~ that carry ~~contain~~ 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.

Each solar field is divided into ~~three~~ 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 ~~Zone~~(NT~~Z~~) 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~~Z~~ mirror washing machines are small and maneuverable. Each solar plant will require one ~~four~~NT~~Z~~ mirror washing machine~~s~~. The NT mirror washing machines will be equipped with certified non-road engines.

Heliostats beyond the NT~~ear Tower~~ 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 ~~tractor-towed trailers~~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 ~~17 tractor-pulled trailers~~7 machines for cleaning heliostats ~~outside the NTZ~~in the FFT Zone. The FFT mirror washing machines will be equipped with heavy-duty on-road engines.

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 Appendix 5.1B, Table 5.1B-10 and are summarized in Table 5.1-25 below.

Table 5.1-25
Emissions from Mirror Cleaning Activities (Total, Both Plants)

	Pollutant						
	Combustion Emissions					Fugitive Dust	
	NOx	SO2	CO	VOC	PM_{10}/$PM_{2.5}$*	$PM_{\cancel{2.5}10}$	~~DPM~~$PM_{2.5}$
Hourly, lb/hr	~~10.7~~ 0.2	~~0.19~~ 0.6	~~3.1~~ 0.1	~~5.1~~ 0.01	~~2.9~~ 0.01	~~0.6~~ 1.7	~~0.4~~ 0.2
Daily, lb/day	~~112.3~~ 4.1	~~2.0~~ 1.1	~~33.0~~ 1.6	~~53.5~~ 1.9	~~30.5~~ 0.1	~~6.4~~ 34.6	~~3.7~~ 3.5
Annual, ton/yr	~~20.5~~ 0.7	~~0.37~~ 0.2	~~6.0~~ 0.3	~~9.8~~ 0.3	~~5.6~~ 0.02	~~1.2~~ 6.3	~~0.7~~ 0.6

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

Criteria Pollutant Emissions: Plant Operation

The calculation of maximum facility emissions shown in Table 5.1-26 is based on the boiler emission rates shown in Table 5.1-21, the fuel use levels in Table 5.1-19, and the following assumption~~s~~:

- Although the auxiliary~~, startup~~ and nighttime preservation boilers are unlikely to be operated at the same time, a worst-case assumption is that boiler operations occur simultaneously.
- 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. ~~Engines will not be tested on a day when the auxiliary boilers are operating.~~
- ~~Mirror cleaning will occur at night and will overlap only with operation of the nighttime preservation boilers.~~

Hourly, daily, and annual emissions from the new facility are shown in Appendix 5.1B, Table 5.1B-11. The maximum hourly, daily, and annual emissions, summarized in Table 5.1-26, are used in the air dispersion modeling to calculate the maximum potential ground-level concentrations contributed by the project to the ambient air.

Greenhouse Gas Emissions (no change in narrative in this section)

Table 5.1-26
Maximum Emissions from New Equipment (see July 3, 2012 Letter to MDAQMD, Table 5.1B-11R2, enclosed as Attachment AQ-1)

Table 5.1-27
Annual Emissions of Greenhouse Gases (GHGs) (see July 3, 2012 Letter to MDAQMD, Table 5.1B-12R2, enclosed as Attachment AQ-1)

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. The comparison in Table 5.1-28 indicates that the Project would not be a major source because its emissions of all pollutants are below the applicable major source thresholds.

Table 5.1-28
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	1~~3.8~~8.3	100	No
SO_2	~~1.8~~ 0.8	100	No
CO	~~30.6~~ 12.9	100	No
VOC	~~5.1~~ 3.1	100	No
PM_{10}	~~4.5~~ 2.1	100	No
$PM_{2.5}$	~~4.5~~ 2.1	100	No
CO_2e	~~99,122~~ 44,513	100,000	No

Non-Criteria Pollutant Emissions

Maximum hourly and annual noncriteria pollutant (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 5.1-29, and were calculated from the heat input rates (in MMBtu/hr and MMBtu/yr) shown in Table 5.1-19 and Table 5.1-20, EPA emission factors (in lb/MMscf), and the nominal higher heating value for the natural gas of 1020 Btu/scf.

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 5.1-17, with supporting calculations shown in Appendix 5.1B, Tables 5.1B-4 through B-7.) 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 5.1.4.6).

Detailed calculations of the TAC emissions from the facility are shown in Appendix 5.1B, Tables 5.1B-14 and 5.1B-15. Toxic air contaminant emissions from the WSACs are negligible, as shown in Table 5.1B-16 of Appendix 5.1B.

Table 5.1-29
Summary of Toxic Air Contaminant (TAC) Emissions from Project Operation

Compound	Maximum Proposed Emissions (total, all units)	
	lb/hr	tpy
Boilers[a]		
Acetaldehyde	5.3~~4.8~~x10-~~3~~4	4.9~~9.5~~x10-4
Acrolein	4.7~~4.2~~x10-~~3~~4	4.3~~8.4~~x10-4
Benzene	1.0~~9.0~~x10-3	9.1~~1.8~~x10-~~3~~4
Ethylbenzene	1.2~~1.1~~x10-~~2~~3	1.1~~2.1~~x10-3
Formaldehyde	2.1~~1.9~~x10-~~2~~3	1.9~~3.8~~x10-3
Hexane	7.7~~6.9~~x10-~~3~~4	7.1~~1.4~~x10-4~~3~~
Naphthalene	1.6x10-~~3~~5	1.1~~2.5~~x10-4
Polycyclic Aromatics	5.2x10-~~4~~5	3.7~~8.4~~x10-5
Propylene	6.6~~1.0~~x10-~~1~~2	4.2~~5.9~~x10-2
Toluene	4.6~~4.1~~x10-~~2~~3	4.2~~8.2~~x10-3
Xylene	3.4~~3.1~~x10-~~2~~3	3.1~~6.1~~x10-~~2~~3
Emergency Engines[b]		
Diesel Particulate Matter	~~1.9~~1.3	6.3~~9.3~~x10-2
Fire Pump Engines[b]		
Diesel Particulate Matter	0.1	5.0~~7.0~~x10-3
~~Mirror Cleaning[c]~~		
~~Diesel Particulate Matter~~	~~0.4~~	~~0.7~~
Total HAPs[d]		1.3~~2.6~~x10-2

Notes:
[a] Emission factors obtained from Ventura County APCD. See Appendix 5.1B, Tables 5.1B-13 through 5.1B-15.
[b] All PM_{10} emissions from Diesel engines are TACs.
~~[c] From Table .~~
[d] Propylene and Diesel Particulate Matter are not HAPs.

As emissions of each individual federally regulated 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 NESHAPs is discussed in Section 5.1.6.1.

Construction Emissions: Project Construction (no expected increase in peak hourly, daily, or annual construction emissions – thus no changes in this section)

Table 5.1-30
Maximum Daily Project Construction Emissions, Pounds Per Day, Month 15 (Combustion), Month 12 (Fugitive Dust) (no changes)

Table 5.1-31
Maximum Annual Onsite Construction Emissions, Tons Per Year (no changes)

Construction Emissions: Linears (no expected increase in peak hourly, daily, or annual construction emissions – thus no changes in this section)

Table 5.1-32
Expected Daily Transmission Line Construction Emissions, Pounds Per Day (no changes)

Table 5.1-33
Transmission Line Construction Emissions, Tons Per Year (no changes)

5.1.4.4 Emissions and Fuel Use Monitoring

~~The auxiliary boilers will be equipped with continuous emissions monitoring systems (CEMS) to measure and record emissions of NO_x and O_2, as required under 40 CFR Parts 60 and 75.~~ The fuel flow rate (in

MMscf) ~~and oxygen levels~~ for each of the boilers will be monitored continuously and permanently recorded.

The auxiliary boilers are subject to Acid Rain requirements, but 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. The LME methodology allows the owner/operator to calculate hourly SO_2, NOx and CO_2 emissions using fuel-specific emission factors. The Applicant will submit an ~~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.

~~For the startup boilers, NO_x emissions will be monitored using a predictive monitoring system (PEMS), as required under 40 CFR Part 60. This system will also monitor and permanently record fuel use.~~ The nighttime preservation boilers will monitor and record fuel use. Vendor supplied emission factors will be used to calculate nighttime preservation boiler emissions based on fuel use data. 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.

Air Quality Modeling Methodology (no changes)

Model Selection (no changes)

Receptor Grid Selection and Coverage (no changes)

Meteorological Data Selection (no changes)

Ambient Background Data Selection (no changes)

Table 5.1-34
Representative Background Ambient Air Quality Monitoring Stations (no changes)

Table 5.1-35
Representative Background Concentrations in the Project Area (µg/m^3) (no changes)

Construction Impacts (no expected increase in peak hourly, daily, or annual construction emissions – thus no expected increase in modeled ambient impacts)

Table 5.1-36
Modeled Maximum Impacts During Project Construction (no changes)

Operational Impacts

Normal Plant Operations

The results of the AERMOD assessment for normal plant operations are summarized in Table 51.37. 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.

1-hour averages

- All emergency engines operational for testing with operation of ~~startup~~auxiliary/nighttime preservation boilers at full load; OR
- All boilers operating at full load.

3-hour and 8-hour averages

- All emergency engines operational for testing with operation of ~~startup~~auxiliary/nighttime preservation boilers at full load; OR
- All boilers operating at full load.

24-hour averages

- All boilers operating with maximum daily emissions and WSACs in operation; OR
- ~~Startup~~Auxiliary and nighttime preservation boilers operating at full load 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.

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~~ with, in some cases, emission rates that are slightly higher than emissions during normal operations~~. 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, the ambient air quality impact analysis included assessments of potential air quality impacts of boiler startups. To simplify the analyses and make sure they are conservative, the following scenarios were evaluated:

~~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 and cold startups will be phased over a two-day period, 8-hour CO emission rates reflect 8 hours of startup to be conservative.~~

- Auxiliary ~~Startup~~ boiler startup: ~~Startup~~ Auxiliary boiler at each power block is in startup simultaneously; nighttime boilers are in operation as well. Although startup times for the ~~startup~~ auxiliary boilers ~~will~~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 ~~will~~are not expected to exceed ~~4~~1 hour~~s~~, 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-3, Appendix 5.1D. Results of the startup impact analysis are shown in Table 5.1-37 along with results for other operating conditions. The highest startup impacts occur during startup of the auxiliary boilers.

Table 5.1-37
Summary of Modeling Results for Facility Operations

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)				PSD Significant Impact Level ($\mu g/m^3$)
		Normal Operation	Startup Operation	~~Hot Standby Operation~~	Inversion Breakup Fumigation	
NO_2	1-hr (max) 1-hr (98th pct) Annual	~~194~~ 165[a] ~~149~~ 160[a] ~~0.08~~ 0.19	~~35~~ 16 ~~27~~ 12 n/a[b]	~~31~~ ~~19~~ ~~n/ab~~	~~27~~ 9 n/a[c] n/a[d]	7.5[e] -- 1.0
SO_2	1-hr 3-hr 24-hr Annual	~~10~~ 2 ~~4~~ 0.9 ~~0.2~~ 0.07 0.01	~~0.9~~ 1.9 ~~0.4~~ 0.8 n/a[b] n/a[b]	~~0.6~~ ~~0.2~~ ~~n/ab~~ ~~n/ab~~	~~5~~ 2 ~~4~~ 2 ~~2~~ 1 n/a[d]	7.8e 25 5 1.0
CO	1-hr 8-hr	~~237~~ 158 ~~19~~ 12	~~95~~ 29 ~~24~~ 8	~~52~~ ~~11~~	~~68~~ 22 ~~45~~ 15	2000 500
PM_{10}	24-hr Annual	~~0.4~~ 0.2 0.02	n/a[b] n/a[b]	~~n/ab~~ ~~n/ab~~	~~0.8~~ 0.7 n/a[d]	5 1
$PM_{2.5}$	24-hr Annual	~~0.4~~ 0.2 0.02	n/a[b] n/a[b]	~~n/ab~~ ~~n/ab~~	~~0.8~~ 0.7 n/a[d]	1.2 0.3

Notes:

[a] Highest 1-hour average NO_2 impacts occur during emergency engine testing; maximum impacts for other pollutants and averaging periods occur during boiler operation. ~~Maximum 1-hour NO_2 impact during normal boiler operations is 47 $\mu g/m^3$; 98th percentile NO_2 impact during normal boiler operation is 32 $\mu g/m^3$.~~ All NO_2 results except fumigation reflect ozone limiting.

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

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

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

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

~~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 5.1-37.~~

Inversion Breakup Fumigation Modeling (no changes)

Demonstration of Compliance

The maximum facility impacts calculated from the modeling analyses described above are summarized in Table 5.1-37 above. The highest modeled 1-hr average NO_2 and CO impacts are expected to occur during engine testing; the highest impacts for other pollutants and averaging periods occur under normal boiler operations. To determine the project's air quality impacts, the 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 5.1-35. 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 Appendix 5.1H.

Maximum project modeling results and background ambient levels are shown in Table 5.1-38. Table 5.1-38 shows that the worst-case background concentration of 24-hour average PM_{10} is already above the state standard and the worst-case background annual PM_{10} concentration is equal to the state annual standard. The project's modeled PM_{10} impacts are below the 24-hr and annual PM_{10} federal thresholds for significance of 5 and 1 µg/m3, respectively. Because the project's modeled impacts are below the federal significance thresholds, the project's emissions would not add a significant contribution to background PM_{10} levels. The data summarized in Table 5.1-38 show that project 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.

Table 5.1-38
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)	~~194~~ 165	92.4	~~286~~ 257	--	339
	1-hr (98th percentile)	~~149~~ 160	78.0	~~167~~171[a]	188	--
	Annual	~~0.08~~ 0.19	17.0	17	100	57
SO_2	1-hr	~~10~~ 2	136.6	~~147~~ 139	196	655
	3-hr	~~4~~ 2	112.9	~~117~~ 115	1300	--
	24-hr	~~2~~ 1	18.4	~~20~~ 19	--	105
	Annual	0.01	2.6	3	80	--
CO	1-hr	~~237~~ 158	1,837	~~2,074~~ 1,995	40,000	23,000
	8-hr	~~45~~ 15	643	~~688~~ 658	10,000	20
PM_{10}	24-hr	~~0.8~~ 0.7	140	141	150	50
	Annual	0.02	20.4	20	--	20

Table 5.1-38
Summary of Results (Modeled Maximum Impacts plus Background)

Pollutant	Averaging Time	Project Impact ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration (Project Impact plus Background) ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	CAAQS ($\mu g/m^3$)
$PM_{2.5}$	24-hr[b]	~~0.8~~ 0.7	18	19	35	--
	Annual[c]	0.02	7.8	8	15	12

Note:
[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). This value represents the five-year average of the annual 1-hr NO_2 98th percentile (modeled impact plus background) for each year (2006 to 2010) as required by June 28, 2010 EPA 1-hr NO_2 NAAQS guidance document. All other totals shown are maximum modeled project impacts combined with maximum monitored background data from Table. Table.

[b] Background concentration shown is the three-year average of the 98th percentile values (2008 to 2010), in accordance with the form of the federal standard.

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

PSD Increment Consumption (no changes)

Preconstruction Monitoring (no changes)

Commissioning Impacts (no changes)

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 as part of a July 3, 2012 submittal to the MDAQMD (see Attachment AQ-1).

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.[2] 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).

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-

[2] The WSACs were not included in the screening HRA because their TAC emissions are negligible (see Table 5.1B-16, Appendix 5.1B).

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 (over prediction) 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 at a residential receptor is less than one in one million, the facility risk is considered not significant.
- If the MICR at a residential receptor 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 at PMI 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 MDAQMD 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 5.1-29. The receptor grid described earlier for criteria pollutant modeling was used for the SHRA. The potential health risks are presented in Table 5.1-39, 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.

Table 5.1-39
Potential Health Risks from the Operation of the Project

	Project	Significance Thresholds	Significant?
Maximum Incremental Cancer Risk (MICR) at Point of Maximum Impact	~~1.38~~ 3.6 in one million	10 in one million	No
MICR at Residential Receptor	~~0.10~~ 0.07 in one million	1 in one million	No
Acute Inhalation Health Hazard Index: 1-hour	~~0.003~~ 0.0007	1.0	No
Acute Inhalation Health Hazard Index: 8-hour	~~0.002~~ 0.0007	1.0	No
Chronic Inhalation Health Hazard Index	~~0.0007~~ 0.0018	1.0	No

The acute and chronic health hazard indices are well below 1.0, and hence, are not significant. The MICR at a residential receptor is ~~0.1~~ 0.07 in one million, below the MDAQMD's 1 in one million threshold for additional analysis, and the MICR at PMI is less than 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.

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 (no expected increase in peak hourly, daily, or annual construction emissions – thus no changes this section)

5.1.5.2 Cumulative Operational Impacts (no changes)

To ensure that potential cumulative impacts of the project and other nearby projects are adequately considered, a cumulative impacts analysis will be conducted in accordance with the protocol included as Appendix 5.1G.

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 greenhouse gases (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 anthropogenically induced 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 for electricity in California be met by projects like Rio Mesa SEGF, which generate energy that does not derive from the combustion of fossil fuels. Senate Bill x12 (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 Rio Mesa SEGF 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. Rio Mesa SEGF 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.

The proposed project 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 RPS 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 Rio Mesa SEGF with that of other types of power plants.

Table 5.1-40
Comparison of GHG Emissions Performance

Type of Power Plant	GHG Emissions Performance, MT CO_2/MW[a]
Rio Mesa SEGF	~~0.043~~ 0.028
Natural Gas Combined Cycle	0.370 to 0.430
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

Note:
[a] All GHG emissions performance data except Rio Mesa SEGF from Ivanpah FSA, Appendix Air-1, October 2009.

Further, even though it is possible to quantify how many gross GHG emissions are attributable to a 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. However, the loading order adopted in 2003 by the CEC and PUC prioritizes the use of generation from renewables, such as Rio Mesa SEGF, over generation from fossil fuel resources. According to the CEC, "[a]s California moves towards an increase reliance on renewable energy, non-renewable energy sources will be curtailed or displaced."[3] 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 Rio Mesa SEGF. 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. The Project will increase renewable generation and contribute to the state's efforts to move toward a high-renewable, low-GHG electricity system. The Project 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
- Mitigation measures.

GHG emissions were quantified in Table 5.1-27. The discussion above supports a determination that the project can be expected to decrease GHG emissions as compared with the current situation. Rio Mesa SEGF will provide more than ~~2,205~~ 1,425 GWh per year 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.

5.1.6 Consistency with Laws, Ordinances, Regulations, and Standards

This section considers consistency separately for federal, state, and local requirements.

[3] Commission Decision for the Ivanpah SEGS, CEC-800-2010-004 CMF, September 2010.

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 greenhouse gases (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 MDAQMD 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 Da: New Source Performance Standards for Electric Utility Steam Generating Units (auxiliary boilers).~~

- 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).

The NSPS emissions limits are compared with the proposed permit limits in Table 5.1-41 below. Emissions from the boilers will be well below the NSPS limits.

Table 5.1-41
Comparison of Boiler Emission Rates with Applicable NSPS Standards

	NO_x	SO_2	PM
~~Subpart Da Limit (Auxiliary Boilers)~~	~~0.11 lb/MMBtu~~	~~1.4 lb/MWh~~	~~0.015 lb/MMBtu~~
Subpart Db Limit (~~Startup~~ Auxiliary 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

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 must continuously monitor NO_x emissions (40 CFR 60.49a), but will use the NO_x CEMS required under Part 75 to meet the NO_x monitoring requirement.~~ The auxiliary ~~startup~~ boilers will use predictive emissions monitoring in lieu of continuous monitoring for NO_x (40 CFR 48b(g)(2)), and will use the LME alternative to Acid Rain CEMS to comply with the monitoring requirements of Part 75.

- 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;[4] the Project will comply by purchasing Tier 2 engines. The common area emergency generator, rated at 500 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 (no changes)

Acid Rain Program (no changes)

Title V Operating Permits Program (no changes)

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 MDAQMD; therefore, compliance with MDAQMD regulations will assure compliance with state air quality requirements.

The CO_2 emission rate of ~~0.041~~ 0.028 MT/MWh would meet the EPS of 0.51 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.

5.1.6.3 Consistency with Local Requirements

The MDAQMD has been delegated responsibility for implementing local, state, and federal air quality regulations in the Mojave Desert Air Basin. The proposed project is subject to District regulations that

[4] Because these are emergency engines, they are not required to meet standards that require "add-on" controls, such as diesel particulate filters or SCR.

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 District requirements.

New Source Review Requirements

The MDAQMD's NSR rule (Regulation XIII-New Source Review) 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 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 MDAQMD Rule 1303.A is presented in Tbale 5.1-42. The detailed per unit daily emission calculations are included in Appendix 5.1.B, Table 5.1B-11. Under Rule 219.E.4.c, the WSACs are exempt from permitting requirements due to a water recirculation rate per WSAC of less than 10,000 gallons per minute.[5] Therefore, the WSACs are not included in this table. This table shows that the boilers and emergency engines are not required to use BACT for NOx, VOC, SO_2 or PM_{10}.

Nevertheless, a detailed discussion regarding control technology options for the boilers is provided in Appendix 5.1C. A summary of the proposed controlled emission rates is provided in Table 5.1-43

Table 5.1-42
Applicability of BACT Requirements Under NSR

Pollutant	BACT Threshold, lb/day	Maximum Boiler Emissions - Per Unit, lb/day	Maximum Engine Emissions – Per Unit, lb/day	BACT Required?
NOx	25	~~22~~ 21	19	no
VOC	25	~~11~~ 10	1	no
SO_2	25	~~4~~ 3	0	no
PM_{10}	25	~~10~~ 7	1	no

[5] The WSACs are exempt from permit requirements (MDAQMD Rule 219.E.4.c: water cooling towers with a water recirculation rate of less than 10,000 gpm and not used for evaporative cooling of process water).

Table 5.1-43
Summary of Proposed BACT

Pollutant	Control Technology	Concentration
NOx, boilers	ultra-low NO_x burners, flue gas recirculation	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	~~0.043~~ 0.028 Mt/MWh

Offsets (no changes)

Air Quality Impact Analysis (no changes)

New Source Review Requirements for Air Toxics (no changes)

New Source Performance Standards (no changes)

Federal Programs and Permits (no changes)

Public Notification (no changes)

Permit Fees (no changes)

Prohibitions

The MDAQMD 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 401 – Visible Emissions: **(no changes)**

Rule 402 – Nuisance: **(no changes)**

Rule 403 – Fugitive Dust: **(no changes)**

Rule 404 – Particulate Matter: **(no changes)**

Rule 406 – Specific Contaminants: **(no changes)**

Rule 407 – Liquid and Gaseous Air Contaminants: (no changes)

Rule 409 – Combustion Contaminants: (no changes)

Rule 431 – Sulfur Content of Fuels: **(no changes)**

Rule 475 – Electric Power Generating Equipment: This rule limits NO_x and PM emissions from electrical generating equipment rated greater than or equal to 50 MMBtu/hr to RACT levels. The NO_x and PM limits apply to the auxiliary ~~and startup~~ boilers (NO_x limit = 80 ppmv @ 3 percent O2; PM limit not to exceed 0.01 gr/dscf @ 3 percent O2 and 11 lbs/hour). The proposed auxiliary ~~and startup~~ boilers will meet this requirement.

Rule 476 – Steam Generating Equipment: (no changes)

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 MDAQMD 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 5.1-44 compares the emissions from the project with the emissions that would occur if the energy provided by the project were provided by a new ~~750~~ 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 HHV, 2 ppmv NOx, 3 lb PM_{10} per 100 MW, 2 ppmv CO, 1.4 ppmv VOC, 0.0006 lb/MMBtu SO_2, 200 starts per year per gas turbine at approximately 56 lbs/start for NO_x per 250 MW gas turbine and 417 lbs/start for CO per 250 MW gas turbine).

Table 5.1-44
Comparison of Emissions Between Rio Mesa Solar Electric Generating Facility and a Well-Controlled Gas Turbine

Emissions/Equipment	Pollutant					
	NO_x	SO_2	CO	VOC	$PM_{10}/PM_{2.5}$	GHG
Maximum Annual Emissions, total tons per year						
Rio Mesa SEFG	~~13.8~~ 8.3	~~1.8~~ 0.8	~~30.6~~ 12.9	~~5.1~~ 3.1	~~4.5~~ 2.1	~~99,122~~ 40,513
Combined-Cycle Gas Turbine Project	~~82.9~~ 59.0	~~4.7~~ 3.2	~~118.1~~ 106.6	~~12.6~~ 8.4	~~33.8~~ 22.5	~~916,837~~ 611,225

5.1.7.2 Construction Activities (no changes)

5.1.7.3 Greenhouse Gas Emissions (no changes)

5.1.7.4 Mirror Cleaning and Other Maintenance Activities (no changes)

5.1.8 Involved Agencies and Agency Contacts (no changes)

Table 5.1-45
Agency Contacts (no changes)

5.1.9 Permits Required and Permit Schedule (no changes)

Table 5.1-46
Permits and Permit Schedule (no changes)

5.1.10 References (no changes)

Figure 5.1-1
2006-2010 Annual Wind Rose -- Blythe, CA #23158 (no changes)

Figure 5.1-2
2006-2010 First Quarter Wind Rose -- Blythe, CA #23158 (no changes)

Figure 5.1-3
2006-2010 Second Quarter Wind Rose -- Blythe, CA #23158 (no changes)

Figure 5.1-4
2006-2010 Third Quarter Wind Rose -- Blythe, CA #23158 (no changes)

Figure 5.1-5
2006-2010 Fourth Quarter Wind Rose -- Blythe, CA #23158 (no changes)

Figure 5.1-6
Relative Locations of the Project and Monitoring Stations (no changes)

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Attachment AQ-1

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July 3, 2012

Chris Anderson
Air Quality Engineer
Mojave Desert Air Quality Management District
14306 Park Avenue
Victorville, CA 92392-2310

Subject: BrightSource Energy Rio Mesa Solar Electric Generating Facility
Application for Determination of Compliance and Authority to Construct

Dear Mr. Anderson:

On behalf of BrightSource Energy, we are pleased to provide the enclosed air quality/public health analysis for the Environmental Enhancement Proposal for the Rio Mesa Solar Electric Generating Facility. The Environmental Enhancement Proposal consists of the removal of one of the 250 MW (nominal) plants (removal of Rio Mesa Solar-III) and moving the common area to adjacent to the far northern reach of the Rio Mesa Solar-I solar field. The number, type, and rating of stationary equipment (boilers, emergency engines, wet surface coolers) and mirror washing equipment, including the operating profiles for this equipment, associated with the remaining two plants will remain identical to the information provided to the District in April 2012 for the Boiler Optimization. In addition, the arrangement of the stationary equipment and equipment/building heights for each power block remains identical to the information provided to the MDAQMD for the Boiler Optimization.

The enclosed analysis summarizes the changes to emissions, ambient air quality modeling impacts, and public health impacts associated with the two-plant design. The revised solar field layout and common area plot plan are included as Attachment 1, and detailed emission calculation summary tables for the two-plant design are included as Attachment 2 in the enclosed document. In addition, the detailed air quality modeling input/output files are included on the enclosed compact disc. We will send a separate confidential submittal to the District containing the spreadsheet with the detailed emission calculations for the two-plant design.

Due to the removal of Rio Mesa Solar-III, the Applicant is hereby cancelling all permit applications for boilers and emergency engines associated with this plant.

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

Sincerely,

Tom Andrews
Senior Engineer

Enclosures

cc: Todd Stewart, BrightSource Energy, Inc.
Andrea Grenier, Grenier & Associates, Inc.
Chris Ellison, Ellison Schneider & Harris
Angela Leiba, URS

Air Quality/Public Health Analysis for Two-Plant Design
Rio Mesa Solar Electric Generating Facility

Summary

With implementation of the two-plant design, Air Quality and Public Health impacts associated with the Rio Mesa Solar Electric Generating Facility (Proposed Project) will continue to be less than significant, and result in a net beneficial effect on the environment impacts when compared to the previous plant design.

Background

The Environmental Enhancement Proposal for the Proposed Project consists of removing one of the 250 MW (nominal) plants (removal of Rio Mesa Solar-III) and moving the common area to adjacent to the far northern reach of the Rio Mesa Solar-I solar field (see Attachment 1, Figures 2-5-R2 and 2-8-R2). The number and type of stationary equipment (boilers, emergency engines, wet surface coolers) and mirror washing equipment, including the operating profiles for this equipment, associated with the remaining two plants will remain identical to the information provided to the Mojave Desert AQMD (MDAQMD) and California Energy Commission (CEC) in April 2012 for the Boiler Optimization. In addition, the arrangement of the stationary equipment and equipment/building heights for each power block remains identical to the information provided to the MDAQMD/CEC for the Boiler Optimization.

Air Quality

The two-plant design will have a net positive effect on the environment compared to the impacts analyzed for the Boiler Optimization. The net reduction in air quality impacts results from the changes outlined below.

- Decreasing the number of fuel-burning units (boilers and emergency diesel engines) will reduce overall facility fuel use and emissions by approximately 1/3. The reductions in natural gas and diesel fuel usage and the associated reductions in emissions of all pollutants (including emissions of greenhouse gases) are depicted in Tables 1 and 2 below.
- Eliminating one of the power blocks reduces emissions from mirror washing activities by 1/3. See Table 3 below.

The total number of months necessary for construction of the Proposed Project is likely to decrease as a result of the two-plant design, and there is no expected increase in the peak daily or annual construction equipment loadings/activity levels. Therefore, the construction impact analysis conducted for the Application of Certification (AFC) submitted to the CEC and the Application for a Determination of Compliance (DOC)/Authority to Construct (ATC) submitted to the MDAQMD in October 2011 is conservative.[1]

[1] See also the response to Data Request 5, included in Supplemental Data Response Set 1A, filed April 16, 2012, which evaluated potential impacts during construction if some of the construction equipment were equipped with lower emissions tier engines.

The overall conclusions presented in the April 2012 Boiler Optimization submittal to the CEC and MDAQMD have not changed: using the criteria employed by California's Air Districts and by USEPA, the Proposed 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 BACT, and will have less-than-significant impacts for all pollutants under CEQA. The proposed two-plant design will not subject the Proposed Project to any new Laws, Ordinance, Regulations, and Standards (LORS).

The two-plant design will reduce maximum annual natural gas fuel use at the facility, as shown in Table 1.

Table 2 shows that annual criteria pollutants and the annual GHG emissions will also be reduced under the two-plant design. The detailed stationary equipment emission calculations are included in Attachment 2, Appendix 5.1B.

TABLE 1
Maximum Facility Fuel Use, Total, All Plants (MMBtu)

Averaging Period	Boiler Optimization	Two-Plant Design
	Natural Gas	
Per Day	4,694	3,130
Per Year	1,119,532	746,355
	Diesel Fuel	
Per Day	40.1	27.6
Per Year	16,129	11,043

TABLE 2
Annual Emissions for Stationary Equipment, Total, All Plants (tons per year)

Pollutant	Boiler Optimization	Two-Plant Design
NOx	12.5	8.3
SO_2	1.2	0.8
CO	19.4	12.9
VOC	4.7	3.1
$PM_{10}/PM_{2.5}$	3.2	2.1
CO_2e	66,753	44,513

Emissions of all pollutants from mirror cleaning activities will also be reduced as a result of the two-plant design, as shown in Table 3. The detailed mirror washing machine (MWM) emission calculations are included in Attachment 2, Appendix 5.1B.

TABLE 3
Annual Emissions for Mirror Cleaning Activities, All Plants (tons per year)

Pollutant	Boiler Optimization	Two-Plant Design
NOx	1.1	0.7
SO_2	0.3	0.2
CO	0.4	0.3
VOC	0.5	0.3
PM_{10}	9.5	6.3
$PM_{2.5}$	0.9	0.6
DPM	0.03	0.02
CO_2e	32,093	21,395

As shown in Table 4, the maximum modeled criteria pollutant impacts for the two-plant design without MWMs will be equal to or slightly higher than the maximum modeled impacts evaluated for the Boiler Optimization. The increases in the maximum impacts for some of the criteria pollutants are primarily due to impacts from the emergency engines located in the common area. As discussed above, the two-plant design includes moving the common area to a location adjacent to the far northern reach of the Rio Mesa Solar-I solar field. With this move, the emergency engines in the common area will be approximately 300 feet from the facility fenceline running along the northern edge of the common area. The orientation of the common area emergency engines and fenceline, combined with winds predominantly blowing to the north, results in higher maximum modeled impacts for some pollutants. These higher impacts occur just to the north of common area near the facility fenceline. While the maximum impacts for some of the pollutants have increased, as shown in Table 5 they remain below state/national ambient air quality standards.

Adding the MWMs to the stationary equipment impacts from the two-plant design results in no change to the impacts for some pollutants, small increases in annual NO_2 and 24-hr SO_2 impacts, and larger increases in 24-hr/annual PM_{10}/$PM_{2.5}$ impacts. The increases in PM_{10}/$PM_{2.5}$ impacts are due to the fugitive dust emissions from the operation of the MWMs. The modeling results for the two-plant design would not change any of the conclusions presented in the April 2012 Boiler Optimization submittal to the CEC and MDAQMD—namely, that Proposed Project 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, Proposed Project impacts are not expected to cause an exceedance of state or federal ambient air quality standards. However, the background state 24-hour and annual PM_{10} standards are exceeded in the absence of the emissions for the Proposed Project. The emission rates/stack parameters used for the modeling analysis of the two-plant design are included in Attachment 2, Appendix 5.1D. The modeling input/output files are provided in the enclosed compact disc.

TABLE 4
Maximum Modeled Impacts[a]

Pollutant	Averaging Period	Project Impact, Boiler Optimization, without MWMs ($\mu g/m^3$)	Project Impact, Boiler Optimization, with MWMs[b] ($\mu g/m^3$)	Project Impact, Two-Plant Design, without MWMs ($\mu g/m^3$)	Project Impact, Two-Plant Design, with MWMs[b] ($\mu g/m^3$)
NOx	1-hr (max)	165	165	165	165
	1-hr (98th percentile)	158	158	160	160
	Annual	0.08	0.09	0.19	0.20
SO_2	1-hr	2	2	2	2
	3-hr	0.9	0.9	0.9	0.9
	24-hr	0.06	0.07	0.07	0.08
	Annual	0.01	0.01	0.01	0.01
CO	1-hr	156	156	158	158
	8-hr	11	11	12	12
PM_{10}	24-hr	0.2	2.0	0.2	1.6
	Annual	0.02	0.59	0.02	0.47
$PM_{2.5}$	24-hr	0.2	0.3	0.2	0.3
	Annual	0.02	0.07	0.02	0.05

[a] All analyses assume that emergency engines may operate concurrently with 249 MMBtu/hr auxiliary boilers.
[b] Modeling results represent total impacts from boilers, emergency engines, and MWMs.

TABLE 5
Modeled Maximum Impacts Two-Plant Design Stationary Equipment and MWMs

Pollutant	Averaging Period	Project Impact, Two-Plant Design, with MWMs[a] (μg/m^3)	Maximum Background Concentration (μg/m^3)	Total Concentration[b] (μg/m^3)	NAAQS (μg/m^3)	CAAQS (μg/m^3)
NO_2	1-hr (highest)	165	92.4	257	--	339
	1-hr (98th percentile)	160	78.0	171[c]	188	--
	Annual	0.20	17.0	17	100	57
SO_2	1-hr	2	136.6	139	196	655
	3-hr	0.9	112.9	114	1300	--
	24-hr	0.08	18.4	19	--	105
	Annual	0.01	2.6	3	80	--
CO	1-hr	158	1,837	1,995	40,000	23,000
	8-hr	12	643	655	10,000	10.000
PM_{10}	24-hr	1.57	140	142	150	50
	Annual	0.47	20.4	21	--	20
$PM_{2.5}$	24-hr[d]	0.27	18	18	35	--
	Annual[e]	0.05	7.8	8	15.0	12

Notes:
[a] Modeling results represent total impacts from boilers, emergency engines, and MWMs.
[b] 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.
[c] Total concentrations shown for 1-hour NO_2 are modeled impacts combined with concurrent hourly NO_2 monitoring data (Tier 4 analysis in Section 3.6 of the modeling protocol). This value represents the five-year average of the annual 1-hr NO_2 98th percentile (modeled impact plus background) for each year (2006 to 2010) as required by June 28, 2010 EPA 1-hr NO_2 NAAQS guidance document.
[d] Background concentration shown is the three-year average of the 98th percentile values, in accordance with the form of the federal standard.
[e] Background value shown is the three-year average of the annual arithmetic mean, in accordance with the form of the standard.

Construction Impacts

The total number of months necessary for construction of the Proposed Project is expected to be reduced as a result of the two-plant design, and there is no expected increase in the peak daily or annual construction equipment loadings/activity levels. The two-plant design is expected to have similar peak daily/annual emissions and result in a reduction in the total overall emissions during the construction period, compared with those evaluated in the AFC submitted to the CEC and the DOC/ATC submittal to the MDAQMD in October 2011. Therefore, the construction impact analysis conducted for the AFC is conservative.[2]

Public Health

As shown in Table 6, the maximum public health impacts for the two-plant design will be equal to the maximum modeled impacts evaluated for the Boiler Optimization with the exception of the incremental cancer risk at the point of maximum impact, worker incremental cancer risk at point of maximum impact, and chronic inhalation health hazard index. The increases in these maximum public health impacts are primarily due to impacts from the emergency engines located in the common area. As discussed above regarding criteria pollutant impacts, the orientation of the common area emergency engines and fenceline, combined with winds predominantly blowing to the north, results in higher maximum modeled impacts. While some of the public health maximum impacts have increased, these impacts will continue to be less than significant. No LORS will change as a result of the proposed two-plant design. Potential public health impacts associated with the Proposed Project will remain below significant impact thresholds, as shown in Table 6. The emission rates and stack parameters used for the two-plant design screening level risk assessment are included in Attachment 2, Appendix 5.1D. The modeling input/output files are provided in the enclosed compact disc.

TABLE 6
Potential Health Risks from the Operation of the Project

	Boiler Optimization without MWMs	Boiler Optimization with MWMs	Two-Plant Design without MWMs	Two-Plant Design with MWMs	Significance Thresholds	Significant?
Maximum Incremental Cancer Risk (MICR) at Point of Maximum Impact (PMI)	0.7 in one million	0.8 in one million	3.6 in one million	3.7 in one million	10 in one million	No
MICR at Residential Receptor	0.1 in one million	0.2 in one million	0.1 in one million	0.1 in one million	10 in one million	No
Maximally Exposed Individual Worker (MEIW) at PMI	0.1 in one million	0.1 in one million	0.6 in one million	0.6 in one million	10 in one million	No
Acute Inhalation Health Hazard Index: 1-hour	0.0007	0.0007	0.0007	0.0007	1.0	No
Acute Inhalation Health Hazard Index: 8-hour	0.0007	0.0007	0.0007	0.0007	1.0	No
Chronic Inhalation Health Hazard Index	0.0003	0.0004	0.0018	0.0018	1.0	No

[2] See Footnote 1.

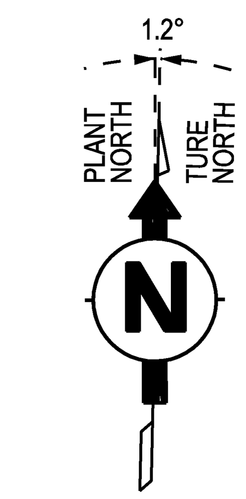
Attachments

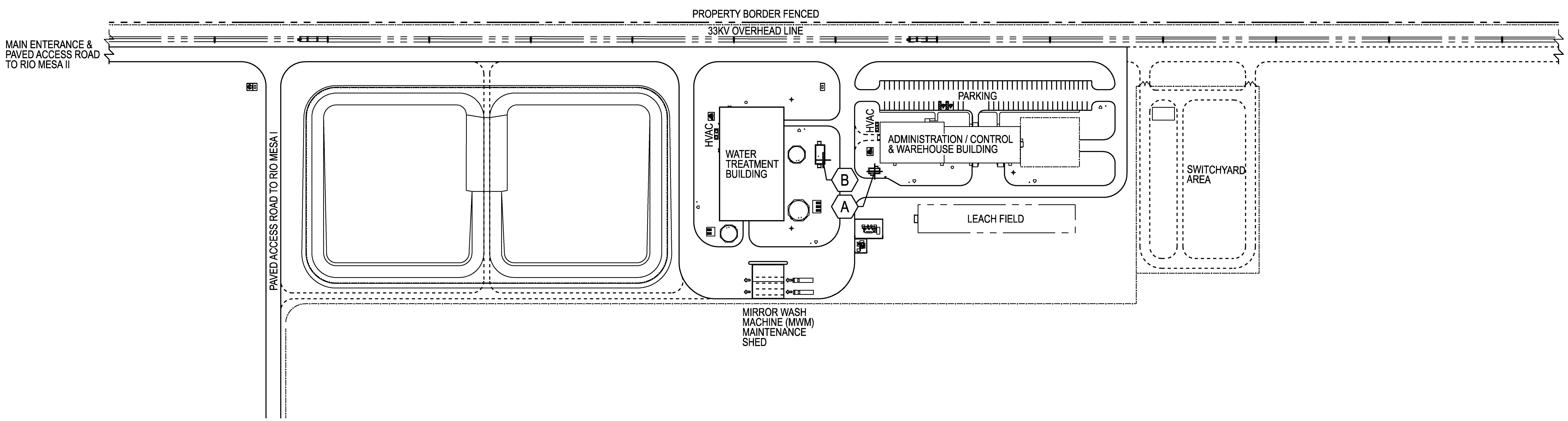
Attachment 1
Revised Figures

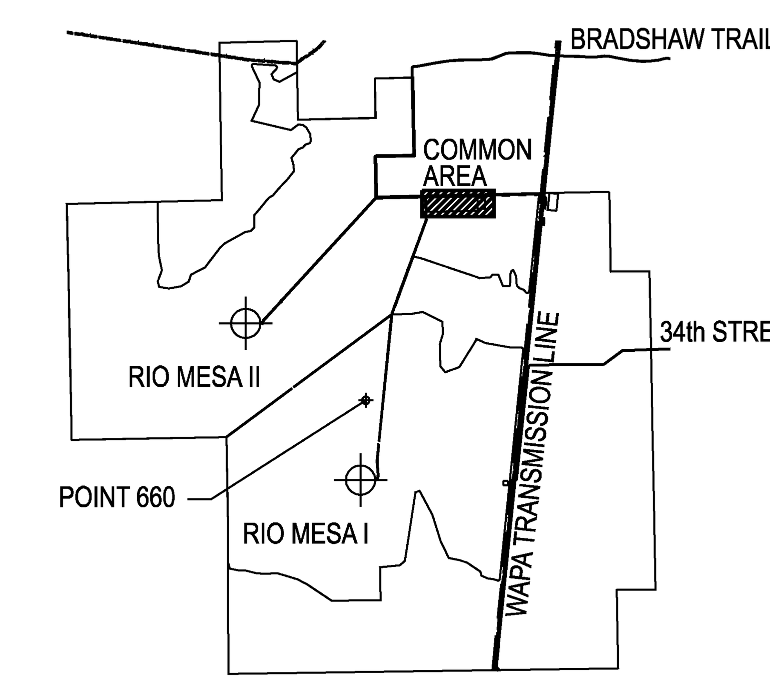
AIR DISPERSION PERMIT POINTS	PLANT GRID NORTH	PLANT GRID EAST	UTM ZONE 11N (NAD83, FEET) NORTHING	UTM ZONE 11N (NAD83, FEET) EASTING	HEIGHT ABOVE GRADE (FEET)	DESCRIPTION
A	76,678.742	33,264.869	12,160,172.522	2,320,441.167	SEE NOTE 1	EMERGENCY DIESEL GENERATOR EXHAUST
B	76,699.609	33,159.195	12,160,192.622	2,320,335.326	SEE NOTE 1	DIESEL FIRE WATER PUMP EXHAUST

NOTES:

1. DIESEL ENGINE EXHAUST HEIGHT TO BE 10 FEET OR HIGHER (TBD by SIERRA RESEARCH).







KEY PLAN

NOTES:

THE COORDINATES SHOWN ON THIS DRAWING ARE BASED ON A LOCAL COORDINATE GRID REFERENCING THE CENTER OF POINT 660 AS 30,000 E, 70,000 N IN THE CALIFORNIA VI STATE PLANE COORDINATE SYSTEM (NAD 83, FEET).

a. HORIZONTAL DATUM:
North American Datum 1983

b. UNIT OF MEASUREMENT
U.S. Survey Feet

c. GRID ORIGIN:
BASED ON THE CENTER OF POINT 660:

PLANT NORTHING:	70,000.0000 FEET
PLANT EASTING:	30,000.0000 FEET
STATE PLANE, CA VI NORTHING:	2,113,820.697 FEET
STATE PLANE, CA VI EASTING:	7,009,888.916 FEET

NO.	DATE	REVISIONS	BY	CHK	EGS				PE
B	05JUN12	REVISED PER OWNER COMMENT	AKS	RPT	RPT	-	-	-	TWA
A	21FEB12	ISSUED FOR INFORMATION	AKS	RPT	RPT				TWA

SCALE: NONE | DRAWN: AKS | DATE: 02FEB12

CBO/AHJ APPROVAL

BECHTEL POWER CORP.
FREDERICK, MARYLAND
Dedicated to Zero Accident Safety and Quality Excellence

RIO MESA
SOLAR ELECTRIC GENERATING FACILITY

AIR DISPERSION PLOT PLAN
COMMON AREA

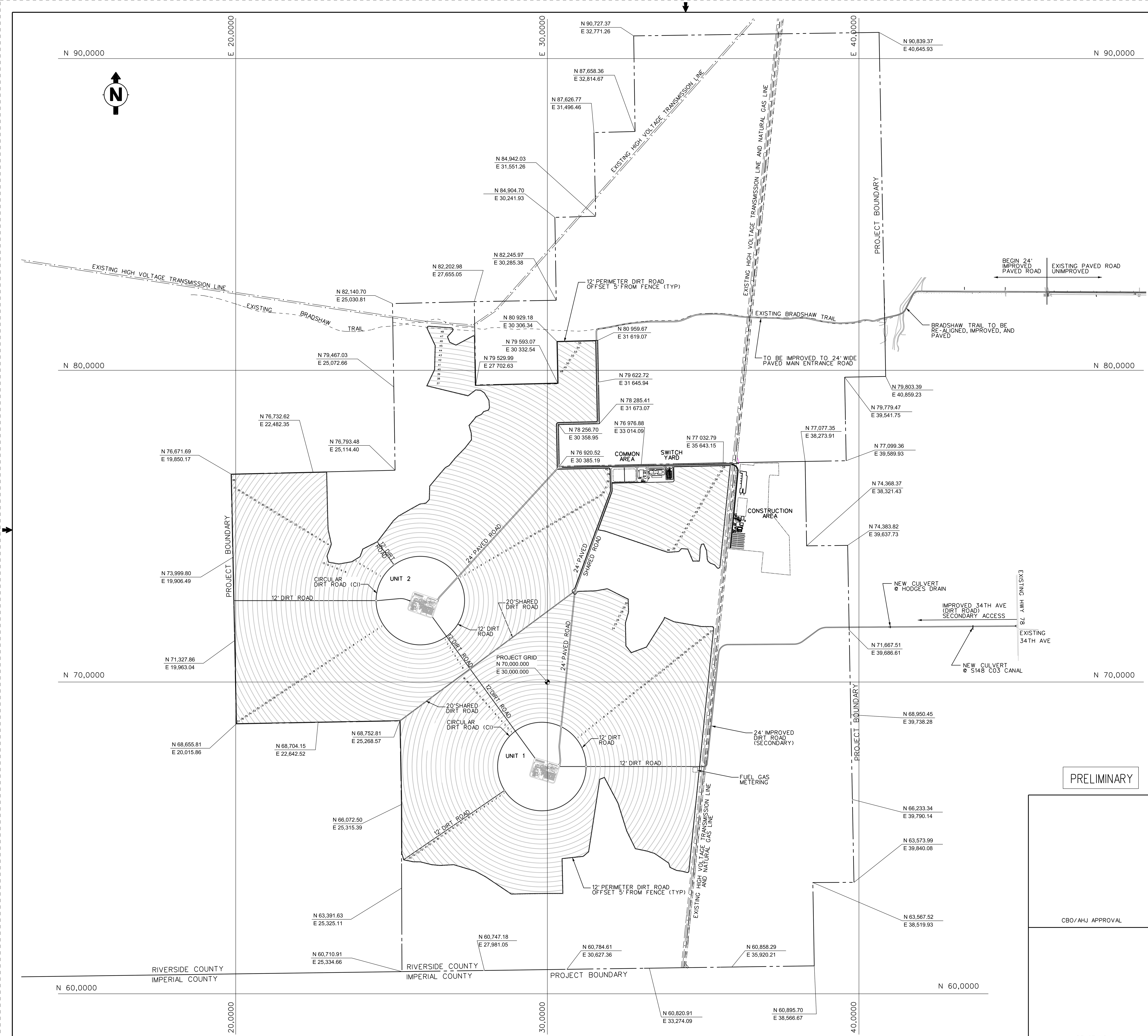
JOB NO.	DRAWING NO.	REV.
25755	009-H1-0010-00001	B

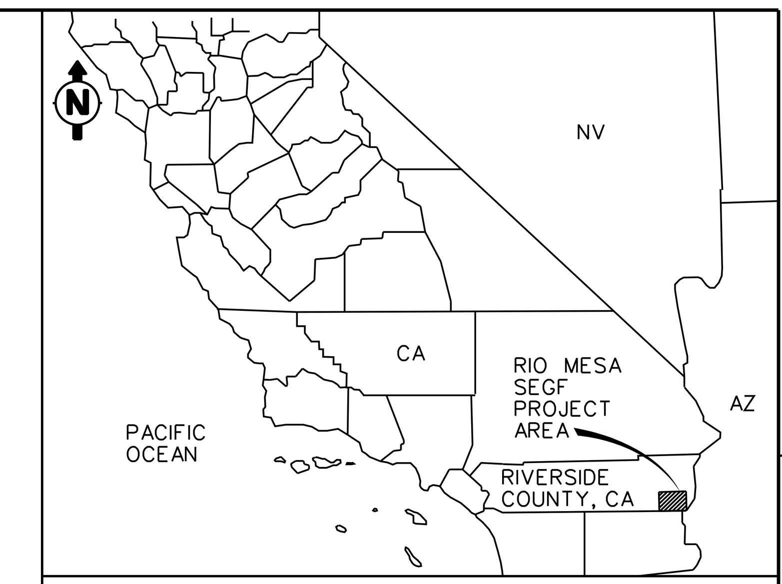
PE STAMP

22"X34" D SIZE

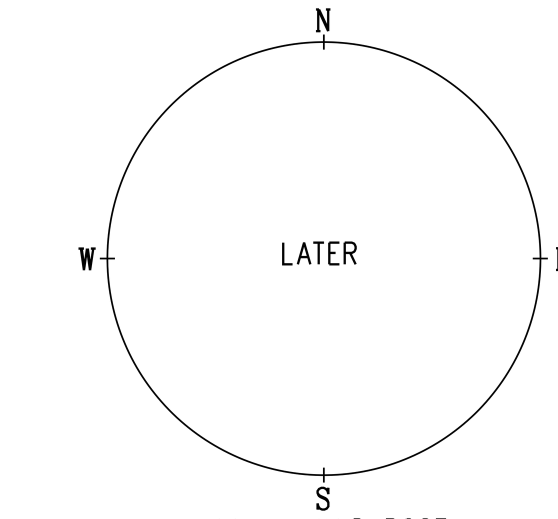
6 5 4 3 2 1

D C B A





VICINITY MAP



ANNUAL WIND ROSE

NOTES:

1. SOLAR TOWER LOCATIONS:

PROJECT GRID COORDINATES			
UNIT	EASTING	NORTHING	COMMENTS
1	29,824.27	67,289.63	
2	25,924.66	72,612.47	

COORDINATES GIVEN TO CENTERLINE POWER TOWER.

2. TOTAL NUMBER OF HELIOSTATS TO BE BETWEEN 80,000 AND 100,000 EACH UNIT.
3. HELIOSTAT MAINTENANCE PATHS TO BE 10' DIRT ROAD.
4. DISTANCE BETWEEN HELIOSTAT MAINTENACE PATHS TO BE 152.6 FT.
5. HELIOSTAT PYLON DENSITY:
   - NEAR TOWER (UP TO 400-500 METERS): 0.03-0.04 PYLONS PER SQUARE METER.
   - 1,000 METERS FROM TOWER: 0.01-0.02 HELIOSTATS PER SQUARE METER.
   - 2,000 METERS FROM TOWER: 0.005-0.01 HELIOSTATS PER SQUARE METER.

LEGEND:

PROJECT BOUNDARY

0 1000 2000 3000
1" - 1000'

PRELIMINARY

NO.	DATE	REVISIONS	BY	CHK	EGS				PE
B	13/JUN/2012	ISSUED FOR OWNER REVIEW	LAP	APM	DWF	-	-	-	TWA
A	5/JUN/2012	ISSUED FOR OWNER REVIEW	LAP	APM	DWF	-	-	-	TWA

SCALE: 1"=1000' DRAWN: 5/JUN/12 DATE: LAP

CBO/AHJ APPROVAL

BECHTEL POWER CORP.
FREDERICK, MARYLAND
Dedicated to Zero Accident Safety and Quality Excellence

RIO MESA SOLAR ELECTRIC GENERATING FACILITY

SITE PLAN

JOB NO.	DRAWING NO.	REV.
25755	000-C2-0000-00001	B

PE STAMP

8 7 6 5 4 3 2 1

H G F E D C B A

34"X44"E SIZE

Attachment 2
Revised Air Quality Appendices

Appendix 5.1: Air Quality (Revised June 2012)

The following briefly describes changes made to Air Quality Appendices 5.1A through 5.1H as a result of the two-plant design.

Appendix 5.1A, Quarterly Wind Roses and Wind Frequency Distributions: no changes

Appendix 5.1B, Emissions and Operating Parameters

Table 5.1B-10R2: Emissions from Mirror Cleaning Activities

Table 5.1B-11R2: Calculations for Maximum Hourly, Daily and Annual Criteria Pollutant Emissions

Table 5.1B-12R2: Greenhouse Gas Emissions Calculations

Table 5.1B-14R2: Calculation of Noncriteria Pollutant Emissions from Auxiliary Boilers

Table 5.1B-15R2: Calculation of Noncriteria Pollutant Emissions from Nighttime Preservation Boilers

Table 5.1B-17R2: Detailed Emission Calculations for Boiler Commissioning

Appendix 5.1C, Emission Control Technology Assessment: no changes

Appendix 5.1D, Ambient Air Quality Modeling Analysis

Table 5.1D-2R2: Emission Rates and Stack Parameters for Refined Modeling

Table 5.1D-5R2: Calculation of Inversion Fumigation Impacts

Table 5.1D-6R2: Emission Rates for Modeling Mirror Washing Activities

Appendix 5.1E, Screening Health Risk Assessment

Table 5.1E-1R2: Screening Level Risk Assessment Results (changes shown in ~~strikeout~~/underline)

Appendix 5.1F, Construction Emissions and Impact Analysis: no changes

Appendix 5.1G, Cumulative Impacts Analysis

Table 5.1G-2R2: Summary of Combined 1-hr NO_2 Results (Modeled Maximum Impacts plus Background) (changes shown in ~~strikeout~~/underline)

Appendix 5.1H, Modeling Protocol and Related Correspondence: no changes

Appendix 5.1B (Revised June 2012)

Emissions and Operating Parameters

Table 5.1B-10R2
Emissions from Mirror Cleaning Activities
Rio Mesa Solar Electric Generating Facility
Revised June 2012

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

Total, all activities	Per Plant, lb/yr	Total 2 Plants, lb/yr	Total 2 Plants, lb/hr	Total 2 Plants, lb/day	Total 2 Plants, ton/yr
NOx	741	1,482	0.2	4.1	0.7
VOC	346	693	0.1	1.9	0.3
SO2	202	405	0.06	1.1	0.20
CO	287	575	0.1	1.6	0.3
PM10/PM2.5 (combustion)	23	46	0.0	0.1	0.02
PM10 (road dust)	6,316	12,632	1.7	34.6	6.3
PM2.5 (road dust)	632	1,263	0.2	3.5	0.6
DPM	23	46	0.01	0.1	0.02

Greenhouse Gas Emissions (GHG)	Metric tons/yr			Short tons/yr of CO2e			
	CO2	CH4	N2O	CO2	CH4	N2O	Total GHG
FFT (Onroad) vehicles	18,092.5	0.7	0.1	19,901.8	17.0	50.1	19,968.8
NT (Offroad) vehicles	1,292.3	0.1	0.0	1,421.6	1.2	3.6	1,426.3

Notes:

1. Emission factors for nonroad vehicles from EPA Nonroad Model documentation, Tier 4 engines: 100 to 175 bhp for NT vehicles (available at http://www.epa.gov/otaq/models/nonrdmdl/nonrdmdl2010/420r10018.pdf).
2. Assume all combustion PM10 is <2.5 um in size.
3. Assume all engines are diesel fueled so all combustion PM is DPM.
4. GHG emission factors from 40 CFR 98, Table C-1 and GWP from 40 CFR 98, Table A-1.; distillate fuel.
5. Unpaved road dust factors from construction emissions calculations; 90% control.

CO2 EF, kg/MMBtu	CH4 EF, kg/MMBtu	N2O EF, kg/MMBtu	GWP for CO2	GWP for CH4	GWP for N2O	Weighted CO2e, kg/MMBtu	Weighted CO2e, lb/MMBtu	Diesel HHV, MMBtu/gal	Weighted CO2e, lb/1000 gal
73.96	0.003	0.0006	1	21	310	74.209	163.3	0.136	22203.33

Table 5.1B-11R2
Calculations for Maximum Hourly, Daily and Annual Criteria Pollutant Emissions
Rio Mesa Solar Electric Generating Facility
Revised June 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**

Table 5.1B-11R2 (cont.)
Calculations for Maximum Hourly, Daily and Annual Criteria Pollutant Emissions
Rio Mesa Solar Electric Generating Facility
Revised June 2012

Maximum Daily Emissions, Normal Operating Day

Equipment	Total Number of Units (1)	Operating Hours/Day	Heat Input, MMBtu/day	Emissions, pounds/day (Each Unit)						Emissions, pounds/day (Combined Total for Two Plants)					
				NOx	SO2	CO	VOC	PM10	PM2.5	NOx	SO2	CO	VOC	PM10	PM2.5
Auxiliary Boilers-- normal operations	2	5	2,490	13.7	2.6	22.8	6.7	6.2	6.2	27.4	5.2	45.5	13.4	12.5	12.5
Auxiliary Boilers-- startup	2	2.5	156	6.9	0.2	11.4	3.4	0.8	0.8	13.7	0.4	22.8	6.7	1.6	1.6
Nighttime Preservation Boilers	2	16	480	2.7	0.5	8.8	1.3	1.2	1.2	5.4	1.0	17.6	2.6	2.4	2.4
Nighttime Pres. Boilers-- startup	2	1	4	0.2	0.0	0.5	0.1	0.0	0.0	0.3	0.0	1.1	0.2	0.0	0.0
Power Block Emergency Generators	2	0.5	24	19.2	0.0	10.4	0.7	0.6	0.6	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	1.3	0.0	1.1	0.1	0.1	0.1
Power Block Fire Pump Engines	2	0.5	1.6	0.7	0.0	0.6	0.0	0.0	0.0	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	0.7	0.0	0.6	0.0	0.0	0.0
WSAC	2	12	0	0.0	0.0	0.0	0.0	0.2	0.2	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 (Each Unit)						Emissions, pounds/day (Combined Total for Two Plants)					
				NOx	SO2	CO	VOC	PM10	PM2.5	NOx	SO2	CO	VOC	PM10	PM2.5
Auxiliary Boilers-- normal operations	2	2	996	5.48	1.0	9.1	2.7	2.5	2.5	11.0	2.1	18.2	5.4	5.0	5.0
Auxiliary Boilers-- startup	2	5	311	13.7	0.4	22.8	6.7	1.6	1.6	27.4	0.7	45.5	13.4	3.1	3.1
Nighttime Preservation Boilers	2	16	480	2.7	0.5	8.8	1.3	1.2	1.2	5.4	1.0	17.6	2.6	2.4	2.4
Nighttime Pres. Boilers-- startup	2	1	4	0.2	0.0	0.5	0.1	0.0	0.0	0.3	0.0	1.1	0.2	0.0	0.0
Power Block Emergency Generators	2	0.5	24	19.2	0.0	10.4	0.7	0.6	0.6	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	1.3	0.002	1.1	0.1	0.07	0.1
Power Block Fire Pump Engines	2	0.5	1.6	0.7	0.0	0.6	0.0	0.0	0.0	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	0.0	0.7	0.0	0.6	0.0	0.0	0.03
WSAC	2	12	0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.36	0.36
Total, Boilers			1,791							44.1	3.8	82.4	21.5	10.5	10.5
Total, Engines			27.6							41.7	0.0	23.7	1.5	1.4	1.4
Total Emissions, lb/day			**1,818.6**							**85.9**	**3.9**	**106.1**	**23.0**	**12.3**	**12.3**

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-12R2
Greenhouse Gas Emissions Calculations
Rio Mesa Solar Electric Generating Facility
Revised June 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	601,657	n/a	31,900	0.60	0.06	--		
Nighttime Preservation Boilers	2	15.0	n/a	4780	345	144,698	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	544	n/a	40	1.6E-03	3.3E-04	--		
Power Block Fire Pump Engines	2	1.63	n/a	200	n/a	653	n/a	48	2.0E-03	3.9E-04	--		
Common Area Fire Pump Engine	1	1.63	n/a	200	n/a	326	n/a	24	9.8E-04	2.0E-04	--		
WSACs	2	--	n/a	2000	n/a	0	n/a	0	0.00	0.00	--		
Circuit breakers	5	--	n/a	8760	n/a	0	n/a	--	--	--	1.5E-03		
Total			--	--		757,398	1,374,000	40,388	0.78	0.08	1.5E-03		
CO2-Equivalent								40,388	16.37	25.19	36.52	44,513	65

Natural Gas GHG Emission Rates (2)

Fuel	Emission Factors, kg/MMBtu			Emission Factor
	CO2 (3)	CH4 (3)	N2O (3)	SF6 (5)
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," December 5, 2007 (Staff's Suggested Modifications to the Originally Proposed Regulation Order Released October 19, 2007). http://www.arb.ca.gov/cc/ccei/reporting/GHGReportRegUpdate12_05_07.pdf
3. 40 CFR 98, Table C-1
4. 40 CFR 98, Table A-1.

5. Sulfur hexafluoride (SF6) will be used as an insulating medium in three 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-14R2
Calculation of Noncriteria Pollutant Emissions from Auxiliary Boilers
Rio Mesa Solar Electric Generating Facility
Revised June 2012

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

Notes:
(1) All factors from Ventura County APCD, "AB2588 Combustion Emission Factors," Natural Gas Fired External Combustion Equipment >100 MMBtu/hr. Available at http://www.vcapcd.org/pubs/Engineering/AirToxics/combem.pdf
(2) Based on maximum hourly boiler heat input of 0.2441 MMscf/hr
(3) Based on total annual heat input of *295.0* MMscf/yr
(4) Total PAHs, excluding naphthalene. See speciation below.
(5) Emission factors for individual PAHs obtained from AP-42, Table 1.4-3, then adjusted proportionally so that total of "Adjusted EF" equals Total PAH EF of 1.0 E-04 lb/MMscf per Ventura County factors.

Speciated PAHs (except naphthalene)

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

Table 5.1B-15R2
Calculation of Noncriteria Pollutant Emissions from Nighttime Preservation Boilers
Rio Mesa Solar Electric Generating Facility
Revised June 2012

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

Notes:

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

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

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

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

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

Speciated PAHs (except naphthalene)

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

Table 5.1B-17R2
Detailed Emission Calculations for Boiler Commissioning
Rio Mesa Solar Electric Generating Facility
Revised June 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

Ambient Air Quality Modeling Analysis

Table 5.1D-2R2

Emission Rates and Stack Parameters for Refined Modeling

Rio Mesa Solar Electric Generating Facility

Revised June 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	8.000	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	8.000	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	8.000	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	1.470E-02	n/a	3.677E-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	8.000	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	8.000	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-6R2
Rio Mesa Solar Electric Generating Facility
Emission Rates for Modeling Mirror Washing Activities
Revised June 2012

	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

Table 5.1D-5R2
Calculation of Inversion Fumigation Impacts
Rio Mesa Solar Electric Generating Facility
Revised June 2012

Boiler Emission Rates, g/s

Unit	NOx	SO2	CO	PM10	# of Units
Auxiliary Boilers	0.345	6.591E-02	0.574	3.677E-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	-	0.17
Nighttime Preservation Boilers[a]	-	0.34	-	0.55
Total	-	0.6	-	0.7

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.

Appendix 5.1E (Revised June 2012)
Screening Level Risk Assessment

Summary of Results

The results of the screening level health risk assessment are summarized in Table 5.1E-1R2.

TABLE 5.1E-1R2 *(REVISED JUNE 2012)*
Screening Level Risk Assessment Results

Risk Methodology	Project Impacts with MWMs
Modeled Residential Cancer Risk (in one million)	
Residential: Derived (OEHHA) Method at PMI	~~0.8~~ **3.7**
Residential: Derived (OEHHA) Method at maximally impacted residential receptor	~~0.15~~ **0.11**
Modeled Worker Cancer Risk (in one million)	
Worker Exposure: Derived (OEHHA) Method at PMI	~~0.12~~ **0.57**
Modeled Acute and Chronic Impacts	
Acute HHI—1-hour RELs	0.0007
Acute HHI—8-hour RELs	0.0007
Chronic HHI	~~0.0004~~ **0.0018**

Appendix 5.1G (Revised June 2012)

Cumulative Impacts Analysis

Table 5.1G-2R2 (REVISED JUNE 2012) Summary of Combined 1-hr NO_2 Results (Modeled Maximum Impacts plus Background)						
Pollutant	**Averaging Time**	**Combined Impact ~~Three~~ <u>Four</u> Projects[a] (µg/m^3)**	**Background Concentration (µg/m^3)**	**Total Concentration (Modeled Impact plus Background) (µg/m^3)**	**NAAQS (µg/m^3)**	**CAAQS (µg/m^3)**
NO_2	1-hr (max) 1-hr (98th percentile)	~~166~~ **<u>165</u>** ~~158~~ **<u>159</u>**	92.4 78.0[b]	~~258~~ **<u>257</u>** 171[c]	-- 188	339 --

Note:

[a] Total impacts for Proposed Project, Blythe Energy Project, Blythe Energy Project Phase II, **<u>and Blythe Solar Power Project</u>**.

[b] Background concentration shown is the three-year average of the 98th percentile values (2008 to 2010), in accordance with the form of the federal standard.

[c] 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). This value represents the five-year average of the annual 1-hr NO_2 98th percentile (modeled impact plus background) for each year (2006 to 2010) as required by June 28, 2010 EPA 1-hr NO_2 NAAQS guidance document.