Mojave Desert Air Quality Management District
14306 Park Avenue, Victorville, CA 92392-2310
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Visit our web site: http://www.mdaqmd.ca.gov
Eldon Heaston, Executive Director

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March 1, 2010

Emiliano Garcia, Manager
Mojave Solar LLC
13911 Park Avenue, Suite 206
Victorville, California 92392-2407

Preliminary Determination of Compliance for the Mojave Solar Project

Dear Mr. Emiliano:

The Mojave Desert Air Quality Management District (MDAQMD) has completed the preliminary decision on the proposed Mojave Solar Project (MSP). Enclosed please find the Preliminary Determination of Compliance (PDOC) for MSP, prepared pursuant to MDAQMD Rule 1306. Written comments on the MSP PDOC will be accepted through approximately April 2, 2010 (the actual public comment period closure date is a function of when the public notice is published). The MDAQMD expects to issue a Final Determination of Compliance on or about April 15, 2010.

If you have any questions regarding this action or the enclosure, please contact Christian Anderson at (760) 245-1661, x 1846.

Sincerely,

Alan J. De Salvio
Supervising Air Quality Engineer

Enclosures: PDOC
Public notice

cc: Chief, Air Permits Office USEPA Region IX
Chief, Stationary Source Division CARB
Craig Hoffman - CEC Project Manager
Email: Greg Darvin – Atmospheric Dynamics
Will Walters - Aspen Environmental Group

AJD/cja MSP PDOC cover.doc

NOTICE OF PRELIMINARY DETERMINATION OF COMPLIANCE

NOTICE IS HEREBY GIVEN that the Mojave Desert Air Quality Management District (MDAQMD) has completed the preliminary decision on an Application for New Source Review for the Abengoa Mojave Solar Project (MSP). The proposed facility will consist of two 125 MW (gross) solar units. The Project uses parabolic trough solar thermal technology to generate electricity. In each power generating unit or power block, the proposed technology uses a steam turbine generator (STG) fed from a solar steam generator (SSG). SSGs receive heat transfer fluid (HTF) from solar thermal equipment comprised of arrays of parabolic mirrors that collect energy from the sun. The applicant is Mojave Solar, LLC, a Delaware limited liability company and wholly owned subsidiary of Abengoa Solar Inc. The mailing address for Mojave Solar LLC is 13911 Park Avenue, Suite 206, Victorville, CA 92392-2407

The proposed project site is approximately nine miles northwest of the town of Hinkley in unincorporated San Bernardino County, lying approximately halfway between the City of Barstow and Kramer Junction. The site is comprised of private property that was historically used as the Lockhart Ranch complex. Currently there are no ranching or residential activities on the property, except for one active pivot irrigation field of approximately 40 acres. The property is currently zoned Rural Living (RL). The MDAQMD received a Request for Agency Participation and Application for Certification for the MSP on September 2, 2009. This Application for Certification was deemed complete on September 8, 2009. The MDAQMD has prepared a Preliminary Determination of Compliance (PDOC) for the MSP pursuant to MDAQMD Rule 1306. The PDOC finds that, subject to specified permit conditions, the proposed project will comply with all applicable MDAQMD rules and regulations.

The PDOC is available for review at the MDAQMD office located at 14306 Park Avenue, Victorville, CA 92392. Please contact Christian Anderson, at the above address or at (760) 245-1661, x 1846 to obtain a copy of the PDOC. Interested persons may comment on this PDOC. To be considered, written comments must be received at the above address no later than thirty days after the date this notice is published. A Final Determination of Compliance will be issued on or about April 15, 2010.

Preliminary Decision/ Determination of Compliance

(Preliminary New Source Review Document)

Abengoa Mojave Solar Project, located approximately nine miles northwest of Hinkley, CA .

Eldon Heaston
Executive Director

Mojave Desert Air Quality Management District

February 26, 2010

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Table of Contents

List of Abbreviations

APCO	Air Pollution Control Officer
ATC	Authority To Construct
ATCM	Airborne Toxic Control Measure
AVAQMD	Antelope Valley Air Quality Management District
BACT	Best Available Control Technology

CARB	California Air Resources Board
CATEF	California Air Toxics Emission Factors
CEC	California Energy Commission
CEMS	Continuous Emissions Monitoring System
CERMS	Continuous Emission Rate Monitoring System
CFR	Code of Federal Regulations
CH_4	Methane
CO	Carbon Monoxide
CTG	Combustion Turbine Generator
dscf	Dry Standard Cubic Feet
ERC	Emission Reduction Credit
°F	Degrees Fahrenheit (Temperature)
FDOC	Final Determination of Compliance
HAP	Hazardous Air Pollutant
HARP	Hot Spots Analysis and Reporting Program
HDPP	High Desert Power Project
HHV	Higher Heating Value
hp	Horsepower
hr	Hour
HRA	Health Risk Assessment
HRSG	Heat Recovery Steam Generator
HTF	Heat Transfer Fluid
LAER	Lowest Achievable Emission Rate
lb	Pound
MACT	Maximum Achievable Control Technology
$\mu g/m^3$	Micrograms per cubic meter
MDAQMD	Mojave Desert Air Quality Management District
MMBtu	Millions of British Thermal Units
n/a	Not applicable
NAAQS	National Ambient Air Quality Standard
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
NSPS	New Source Performance Standard
O_2	Molecular Oxygen
OEHHA	Office of Environmental Health Hazard Assessment
OLM	Ozone Limiting Method
o/o	Owner/Operator
PAH	Polycyclic Aromatic Hydrocarbons
PDOC	Preliminary Determination of Compliance
PHPP	Palmdale Hybrid Power Project
$PM_{2.5}$	Fine Particulate, Respirable Fraction $\leq$ 2.5 microns in diameter
PM_{10}	Fine Particulate, Respirable Fraction $\leq$ 10 microns in diameter
ppmvd	Parts per million by volume, dry
PSD	Prevention of Significant Deterioration
RSP	Rapid Start Process
SCAQMD	South Coast Air Quality Management District

SJVAPCD	San Joaquin Valley Unified Air Pollution Control District
SCLA	Southern California Logistics Airport
SCR	Selective Catalytic Reduction
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SO_x	Oxides of Sulfur
STG	Steam Turbine Generator
TOG	Total Organic Gases
tpy	Tons per Year
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds

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1. Introduction

The Mojave Desert Air Quality Management District (MDAQMD) received an Application for New Source Review for the Abengoa Mojave Solar Project (MSP) and received a Request for Agency Participation and Application for Certification for the Abengoa Mojave Solar Project on September 2, 2009.[1] For clarity and consistency, the MDAQMD will herein refer to this project as the "MSP" or "Project".

As required by MDAQMD Rule 1306(E)(1)(a), this PDOC reviews the proposed project, evaluating worst-case or maximum air quality impacts, and establishes control technology requirements and related air quality permit conditions. This PDOC represents MDAQMD's preliminary pre-construction compliance review of the proposed project, to determine whether construction and operation of the proposed project will comply with all applicable MDAQMD rules and regulations.

2. Project Location

The Project is a solar electric generating facility proposed on approximately 1,765 acres in unincorporated San Bernardino County, California approximately nine miles northwest of Hinkley, CA. The project site has been designated non-attainment for the Federal 8-hour ozone ambient air quality standard (NAAQS) and PM_{10} ambient air quality standards (NAAQS). The area is attainment or unclassified for all other standards and averaging times. The proposed site is largely fallow agricultural land. This land was originally sited as Solar Electric Generating Stations (SEGS) XI and XII and is located next to the existing SEGS VIII and IX facilities.

3. Description of Project

The proposed facility will consist of two 125 MW (gross) solar units. The Project would use well-established parabolic trough solar thermal technology to produce electrical power, which uses a steam turbine generator (STG) fed from a solar steam generator (SSG). SSGs receive heat transfer fluid (HTF) from solar thermal equipment comprised of arrays of parabolic mirrors that collect energy from the sun.

Each of the two power blocks will consist of a solar array field, auxiliary low pressure steam boiler for the HTF freeze protection system, steam turbine, emergency generator set, emergency fire pump system, an HTF ullage/expansion system with nitrogen blanket and cooling condenser, various feed-water heaters and pumps, a cooling tower, electrical interconnections, and a single main control building, with several small adjacent buildings for support services. There will be one (1) above ground gasoline storage tank (2000 gallon capacity) and associated fuel dispensing equipment to be located at tbd power block site.

MSP is proposing to install:

- two (2) latest tier emergency fire pump engines rated at approximately 346 hp
- two (2) latest tier emergency generator sets rated at 4160 hp (2500 kW)
- two (2) auxiliary natural gas fired boilers each rated at ~21.5 MMBtu/hr
- two (2) wet cooling towers

[1] E. Heaston (MDAQMD) to C. Hoffman (CEC), September 8, 2009.

- two (2) HTF ullage/expansion systems with nitrogen blanket and cooling condenser
- one (1) gas dispensing facility.

The internal combustion engines will meet all applicable California Air Resources Board (CARB) and U.S. Environmental Protection Agency (USEPA) Tier emissions standards depending upon engine size, year of manufacture, and service category. Additionally, the engines will meet the requirements of the CARB Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines.

Proposed equipment specifications, for emissions sources, are summarized as follows:

Auxiliary Boilers (2)

- Manufacturer: Nebraska Boiler (or equivalent)
- Model: D-Type Watertube
- Fuel: Natural Gas
- Rated Heat Input: 21.5 MMBtu/hr
- Fuel consumption: ~21000 scf/hr (Gas HHV 1025 Btu/scf)
- Exhaust flow: 3589 dscfm, 6184 acfm, at 100% load
- Exhaust temperature: ~301 degrees Fahrenheit (°F)
- Low NO_x burner (9 ppmv)

Fire Pump Engines (2)

- Manufacturer: John Deere or equivalent Model: 6090H
- Fuel: Diesel or distillate oil (15 ppmw S)
- Rated horsepower: 346 hp
- Fuel consumption: ~7.6 gallons per hour (gph)
- Exhaust flow: ~2643 actual cubic feet per minute (acfm)
- Exhaust temperature: ~821 degrees Fahrenheit (°F)

Emergency Electrical Generators (2)

- Manufacturer: Caterpillar or equivalent
- Model: 3516C-HD TA
- Fuel: Diesel or distillate oil (15 ppmw S)
- Rated horsepower: ~4160 (2500 kW)

- Fuel consumption: ~173.3 gph
- Exhaust flow: 19049 acfm
- Exhaust temperature: 922 degrees Fahenreheit (°F)

Cooling Towers (2)

- Manufacturer: CTD, Inc. or equivalent
- Number of Cells: 6
- Number of Fans: 6 (1,310,000 acfm each for annual average conditions)
- Water circulation rate: ~90,000 gallons per minute (gpm)
- Drift rate: 0.0005%
- Expected average TDS: ~9968 ppmw

HTF Ullage/Expansion System (2)

- Five vertical ASME-rated expansion tanks
- One nitrogen-condensing ASME-rated tank
- Two vertical HTF storage tanks with cooling condensers on vent stacks
- HTF Circulation Pumps
- Low Boilers and High Boilers cleaning system (distillation)
- Associated piping and components

Gasoline Dispensing Facility (1)

- 2000 gallon above ground storage tank
- Associated piping and fuel dispensing equipment
- Phase I and II vapor recovery
- Standing loss controls

The only fuels to be combusted on-site will be California-certified low-sulfur low-aromatic diesel fuel used by the emergency fire pump and the emergency generator engines, and pipeline-quality natural gas for the auxiliary boilers.

Overall Project Emissions

Operation of the Project will result in emissions to the atmosphere of both criteria and toxic air pollutants from the proposed auxiliary boilers, fire pumps, emergency generator engines, and cooling towers, the HTF ullage/expansion tank equipped with nitrogen blanket and cooling

condenser, gasoline storage tank/dispensing, and fugitive losses from the HTF system. Criteria pollutant emissions will consist primarily of nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOCs), sulfur oxides (SO_x), sub 10-micron particulate matter (PM10), PM10 contains the sub 2.5-micron particulate matter (PM2.5 as a sub-component). Air toxic pollutants will consist of a combination of toxic gases and toxic particulate matter species. Tables 1 and 1A list the pollutants that may potentially be emitted from the proposed Project. [2] [3] For natural gas-fired equipment, emissions calculations are based on the Higher Heating Value (HHV) of the natural gas fuel.

Maximum Annual Emissions

Table 1 presents maximum annual facility operational emissions. Table 1A presents maximum annual facility hazardous air pollutant (HAP) emissions. For this project, $PM_{2.5}$ emissions are assumed to be equal to PM_{10} emissions, which were calculated using a PM_{10} emissions factor.

Table 1 – MSP Maximum Annual Operational Emissions
(All emissions presented in tons per year)

	NO_x	CO	VOC	SO_x	$PM_{10/2.5}$
MSP Facility Maximum	**2.4**	**2.0**	**2.2**	**0.03**	**13.5**

[2] "Application for Certification Mojave Solar Project", July 2009.
[3] "Abengoa Mojave Solar Project Supplemental Written Response to Data Request Set 1A (nos. 1-93) for Air Quality and Public Health", January 11, 2010.

Table 1A – MSP Maximum Annual HAP Emissions (All emissions presented in pounds per year)		
	Total	**Threshold**
Acetaldehyde	7.6	20,000
Acrolein	0.3	20,000
Arsenic	0.1	20,000
Benzene	1356.3	20,000
Biphenyl	667	20,000
1,3-Butadiene	2.1	20,000
Cadmium	0.0	20,000
Chromium	0.1	20,000
Ethylbenzene	0.1	20,000
Formaldehyde	16.7	20,000
Hexane	0.0	20,000
Lead	0.1	20,000
Manganese	38.5	20,000
Mercury	0.0	20,000
Naphthalene	0.0	20,000
Nickel	0.1	20,000
PAHs (4)	0.0	20,000
Phenol	30	20,000
Propylene oxide	0.0	20,000
Selenium	0.2	20,000
Toluene	95.7	20,000
Xylene	0.2	20,000
Total HAPS	2215.2	50,000
Note: Threshold equivalent to 10 tpy per HAP and 25 tpy combined		

Maximum Daily Emissions

Table 2 presents maximum daily facility emissions calculated under worst case conditions.

Table 2 – MSP Maximum Daily Operational Emissions					
	NOx	**CO**	**VOC**	**SO_x**	**PM_{10}**
Pounds per day	1359	4853	577	64	931

4. Control Technology Evaluation/BACT Determination

Best Available Control Technology (BACT) is required for any new Permit Unit which emits, or has the Potential to Emit, 25 pounds per day or more of any Nonattainment Air Pollutantl. (MDAQMD Rule 1303(A)). The proposed project site is state non-attainment for ozone and PM_{10} and their precursors and unclassified for federal standards for ozone and PM_{10}. Based on the proposed project's maximum daily emissions as calculated in §4 above and appendix A, the project does not trigger BACT for any of the proposed equipment. the proposed internal combustion engines, which have the potential to emit more than 25 pounds per day of NO_x, and the Heat Transfer Fluid (HTF) compounds, which have the potential to emit more than 25 pounds per day.

The applicant proposes BACT for the internal combustion engines; and BACT or presumptive MACT for all emissions units and has submitted an analysis that evaluates the control technology for these pollutants, trace organics, and trace metals.[3] The BACT emission rates are at least as stringent as applicable federal regulations such as the applicable National Source Performance Standards (NSPS) for Stationary Compression Ignition Internal Combustion Engines (40 CFR Part 60 Subpart IIII).

Proposed Limits for each 21MMBtu/hr Natural Gas Fired Boiler

Table 3 – MSP – Proposed Limits for Natural Gas Boilers		
Pollutant	Limit	Control
NO_x	9.0 ppm at 3% O_2	Ultra low-NO_x burner
VOC	None	PUC quality natural gas
PM	None	PUC quality natural gas
SO_x	None	PUC quality natural gas
CO	50 ppm at 3% O_2	Ultra low-NO_x burner

MACT for each Expansion Tank/Ullage Vent System

MACT for VOC and toxic emissions from the HTF expansion tank/ullage vent system is a nitrogen blanket/vent cooling condenser with a District approved comprehensive inspection and maintenance program.

Table 4 – MSP – Proposed Limits for HTF System	
Pollutant	Control
VOC	1. 99% 2. Daily Inspection 3. Maintenance Plan
NO_x, SO_x, CO, PM	Not Applicable

[3] ibid

BACT for each Cooling Tower

BACT for a vertically-oriented wet cooling tower as proposed for use by the applicant has been determined to be a high efficiency drift eliminator.

Table 5 – MSP – Proposed Limits for Cooling Towers	
Pollutant	Control
PM	Drift rate not to exceed 0.0005%
VOC	Hydrocarbon leak detection device
NO_x, SO_x, CO	Not Applicable

The proposed cooling towers will have drift eliminators with vendor-guaranteed PM control efficiency of 0.0005%. The facility will be required to have a functional hydrocarbon detection device and to repair leaks in a timely manner. The proposed cooling towers meet the above requirements.

BACT for each Internal Combustion Engine – Emergency Fire Pump and Emergency Generator (total of four engines)

The proposed engines are compliant with the current applicable NSPS for Stationary Compression Ignition Internal Combustion Engines (40 CFR Part 60 Subpart IIII) and with the applicable California State Airborne Toxic Control Measure for Stationary Compression Ignition Engines (17 CCR 93115). These diesel engines must meet the latest Tier for emergency engines at the time of purchase. Compliance with the NSPS and ATCM is determined to be BACT for the fire pump and emergency generator engines and is found to be an engine meeting the current Tier requirements.

Table 6 – MSP – BACT for Emergency Internal Combustion Engines				
Proposed Engine	NO_x + NMHC (g/bhp-hr)	PM (g/bhp-hr)	CO (g/bhp-hr)	SO_x
346 hp Tier III	3.0	0.15	2.6	15 ppm S fuel
4190 bhp Tier II	4.8	0.15	2.6	15 ppm S fuel

Proposed Limits for the Above Ground Gasoline Storage Tank and Dispensing System

The proposed system is compliant with the current California Air Resources Board standards for above ground gasoline storage/dispensing. The system must comply with the standards at the operative date. Compliance with CARB requirements meets the most stringent standards set forth for vapor recovery and control for AST.

Table 7 – MSP – Proposed Limits for GDF	
Pollutant	Control
VOC	Phase I EVR system Phase II system Standing Loss Control for New installation
NO_x, SO_x, CO, PM	Not Applicable

6. PSD Class I Area Protection

The Clean Air Act (CAA) established the PSD permit program to prevent areas that currently have clean air from significant deterioration. The PSD permit program limits emissions by requiring permits for major stationary air pollution sources. The MSP did not evaluate the visibility reduction potential of project emissions on Prevention of Significant Deterioration (PSD) Class I areas. The MSP does not have the potential to emit 25 tons per year or more of criteria pollutants and so are not required to complete such an evaluation. The MSP is not a major source nor is it subject to the PSD requirements Title I, Part C of the Federal Clean Air Act (42 U.S.C. §§7470-7492) which apply to major sources only and therefore is in compliance with the PSD requirements of Rule 1300.

7. Air Quality Impact Analysis

MSP performed the ambient air quality standard impact analyses for CO, PM_{10}, $PM_{2.5}$, SO_2 and NO_2 emissions. The MDAQMD approves of the analysis methods used in these impact analyses and the findings of these impact analyses.

Findings

The impact analysis calculated a maximum incremental increase for each pollutant for each applicable averaging period, as shown in Table 8 below. When added to the maximum recent background concentration, the MSP did not exceed the most stringent (or lowest) standard for any pollutant except PM_{10}, which is already in excess of the State standard without the project.

Table 8 – MSP – Maximum Ambient Air Quality Impacts					
	Project Impact	**Background**	**Total Impact**	**Federal Standard**	**State Standard**
Pollutant	*All values in $\mu g/m^3$*				
NO_2 (1 hour)	129.6	154	283.6	n/a	339
NO_2 (annual)	0.051	42	42.1	100	57
PM_{10} (24 hour)	1.31	154	155.3	150	50
PM_{10} (annual)	0.102	38.4	38.5	n/a	20
$PM_{2.5}$ (24 hour)	1.31	28.0	29.3	35	n/a
$PM_{2.5}$ (annual)	0.102	10.4	10.5	15	12
CO (1 hour)	75.5	4025	4101	40,000	23,000
CO (8 hour)	7.8	1789	1797	10,000	10,000
SO_2 (1 hour)	0.25	94	94.3	n/a	655
SO_2 (3 hour)	0.17	23	23.2	1300	n/a
SO_2 (24 hour)	0.07	13	13.1	365	105
SO_2 (annual)	0.002	3	3	80	n/a

Inputs and Methods

Maximum emissions from both power blocks under normal operating conditions were modeled. Emissions from the power blocks are presented above in Table 8. A recent four-year (2002 through 2006) hourly meteorological data set from the meteorological tower at the Daggett Airport was used. Mixing heights were determined from Desert Rock, Nevada data. For determining NO_2 impacts using a NO_x background, the hourly Ozone Limiting Method (OLM) for conversion of NO_x to NO_2 was used. The latest versions of AERMOD preprocessors were used to determine surface characteristics (AERSURFACE version 08009), process meteorological data (AERMET version 06341) and determine receptor slope factors (AERMAP version 09040).

The AERMOD dispersion model (version 07026) was used to estimate ambient concentrations resulting from MSP emissions. The dispersion modeling was performed according to USEPA requirements.

8. Health Risk Assessment and Toxics New Source Review

MSP performed a Health Risk Assessment (HRA) for carcinogenic, non-carcinogenic chronic, and non-carcinogenic acute toxic air contaminants. The MDAQMD approves of the HRA methods and findings.

Findings

The HRA calculated a peak 70-year cancer risk of 0.259 per million. The calculated peak 70-year residential cancer risk is less than 1.0 per million (for all receptors). The maximum non-cancer chronic and acute hazard indices are both less than the significance level of 1.0 (0.00208 and 0.0101, respectively). As these risks make the project a "low priority" project, and as the project emits less than 10 tons per year of every single HAP and 25 tons per year of any

combination of HAPs, no further toxics new source review is required for this project (Rule 1320(E)(2)(b)). Please refer to Table 1A above for a summary of project HAP emissions.

Inputs and Methods

MSP will emit toxic air contaminants as products of natural gas combustion, diesel fuel combustion, venting of the ullage tank/expansion system, venting of the non-retail gas dispensing equipment, equipment wear, and cooling tower emissions. Combustion emissions were estimated using emission factors from USEPA, and a speciation profile for polycyclic aromatic hydrocarbons (PAH) was derived from the California Air Toxics Emission Factors (CATEF) database. Cooling tower emissions were estimated using USEPA emission factors for evaporative emissions, engineering calculation for drift droplets, and water quality data from the Ryken and Wetlands Supply Wells.

The AERMOD dispersion model was used to estimate ambient concentrations of toxic air pollutants. Dispersion results were loaded into HARP via the HARP On-Ramp Program. The Hot Spots and Reporting Program (HARP, Version 1.4a, 2008) risk assessment model was used to estimate health risks due to exposure to emissions. The AERMET/AERMOD meteorological dataset was used for the risk analysis.

9. Offset Requirements

MDAQMD Regulation XIII – *New Source Review* requires offsets for non-attainment pollutants and their precursors emitted by large, new sources. The MSP does not have the PTE 25 tons or more per year of the criteria pollutants. Offsets are not required for the MSP.

Table 9 - Comparison of MSP – Emissions with Offset Thresholds
All emissions in tons per year

	NO_x	**VOC**	**SO_x**	**PM_{10}**
Maximum Annual Potential to Emit	2.4	2.2	0.03	13.5
Offset Threshold	25	25	25	15

10. Applicable Regulations and Compliance Analysis

Selected MDAQMD Rules and Regulations will apply to the proposed project:

Regulation II – Permits

Rule 212 – Standards For Approving Permits establishes baseline criteria for approving permits by the MDAQMD for certain projects. In accordance with these criteria, the proposed project accomplishes all required notices and emission limits through the PDOC and complying with stringent emission limitations set forth on permits.

Regulation IV - Prohibitions

Rule 401 – *Visible Emissions* limits visible emissions opacity to less than 20 percent (or Ringelmann No. 1). During start up, visible emissions may exceed 20 percent opacity. However, emissions of this opacity are not expected to last three minutes or longer. In normal operating mode, visible emissions are not expected to exceed 20 percent opacity.

Rule 402 – *Nuisance* prohibits facility emissions that cause a public nuisance. The proposed combustion equipment exhaust is not expected to generate a public nuisance due to the use of pipeline-quality natural gas as a fuel for the auxiliary boiler and low sulfur diesel fuel and limited use of the emergency ICE. In addition, due to the location of the proposed project, no nuisance complaints are expected.

Rule 403 – *Fugitive Dust* specifies requirements for controlling fugitive dust. The proposed project includes 1,765 acres of which only a small portion will be paved. As such, the remaining acreage will have the potential to generate a significant amount of fugitive dust if left untreated. MSP will apply an approved dust suppression coating to unpaved roadways within and around the solar fields. The proposed project is not expected to violate Rule 403.

Rule 404 – *Particulate Matter – Concentration* specifies standards of emissions for particulate matter concentrations. The sole use of pipeline-quality natural gas as a fuel will keep proposed project emission levels in compliance with Rule 404.

Rule 405 – *Solid Particulate Matter - Weight* limits particulate matter emissions from fuel combustion on a mass per unit combusted basis. The sole use of pipeline-quality natural gas as a fuel will keep proposed project emission levels in compliance with Rule 405.

Rule 408 – *Circumvention* prohibits hidden or secondary rule violations. The proposed project is not expected to violate Rule 408.

Rule 409 – *Combustion Contaminants* limits total particulate emissions on a density basis. The sole use of pipeline-quality natural gas as a fuel will keep proposed project emission levels in compliance with Rule 409.

Rule 430 – *Breakdown Provisions* requires the reporting of breakdowns and excess emissions. The proposed project will be required to comply with Rule 430 by permit condition.

Rule 431 – *Sulfur Content in Fuels* limits sulfur content in gaseous, liquid and solid fuels. The sole use of pipeline-quality natural gas as a fuel will keep the proposed project in compliance with Rule 431.

Rule 476 - *Steam Generating Equipment* limits NO_x and particulate matter from steam boilers, including the auxiliary boiler, and specifies monitoring and recordkeeping for such equipment. The proposed project will have specific permit conditions requiring compliance with these provisions.

Regulation IX – Standards of Performance for New Stationary Sources

Regulation IX includes by reference the NSPS for Stationary Compression Ignition Internal Combustion Engines (40 CFR 60 Subpart IIII). Permit conditions for the proposed project will establish limits which are in compliance with the compression ignition engine NSPS referenced in Regulation IX.

Regulation XI - Source Specific Standards

Rule 1113 - *Architectural Coatings* limits VOC content of applied architectural coatings. The proposed project will be required to use compliant coatings by permit condition.

Rule 1157 – *Boilers and Process Heaters* requires industrial boilers, including the auxiliary boiler to implement RACT to control NOx and CO emissions. As these boilers meet the more stringent NOx and CO requirements required by BACT, the boilers are compliant. Permit conditions for the proposed project will require compliance with all applicable sections of Rule 1157.

Rule 1158 – Electric Power Generating Facilities. This rule is applicable to any electrical generating steam boilers, including auxiliary boilers, or combined-cycle turbine units used in conjunction with an electrical generating steam boiler. As the auxiliary boilers are used for freeze protection and do not provide steam for electrical generation this rule does not apply.

Regulation XIII – New Source Review

Rule 1300 – *General* ensures that Prevention of Significant Deterioration (PSD) requirements apply to all projects. The proposed project does not have the PTE to emit 25 tons per year or more of criteria pollutants and therefore is not a major source of emissions. As this facility is not a major source it is not subject to the PSD requirements Title I, Part C of the Federal Clean Air Act (42 U.S.C. §§7470-7492 which apply to major sources only and therefore is in compliance with the PSD requirements of Rule 1300.

Rule 1302 – *Procedure* requires certification of compliance with the Federal Clean Air Act, applicable implementation plans, and all applicable MDAQMD rules and regulations. The ATC application package for the proposed project includes sufficient documentation to comply with Rule 1302(D)(5)(b)(iii). Permit conditions for the proposed project will require compliance with Rule 1302(D)(5)(a)(iii).

Rule 1303 – *Requirements* requires BACT at major new sources and permit units which have the PTE to emit more than 25 pounds per day of criteria pollutants. As this facility is not a major source BACT is only required for the fire pump internal combustion engines, and the wet cooling towers which have the PTE to emit more than 25 pounds per day of a nonattainment air pollutant (NOx-ICE, and PM10-Cooling Tower).

Rule 1305 – *Emissions Offsets* this facility does not have the PTE a regulated air pollutant in an amount greater than or equal to MDAQMDs offset threshold amounts and therefore offsets are not required.

Rule 1306 – *Electric Energy Generating Facilities* places additional administrative requirements on projects involving approval by the California Energy Commission (CEC). The proposed project will not receive an ATC without CEC's approval of their Application for Certification, ensuring compliance with Rule 1306.

Regulation XII – Federal Operating Permits

Regulation XII contains requirements for sources which must have a federal operating permit and an acid rain permit. The proposed project will not be required to submit applications for a federal operating permit because this facility is not a major source nor is a federal operating permit required under any applicable federal regulation.

Maximum Achievable Control Technology Standards

Health & Safety Code §39658(b)(1) states that when USEPA adopts a standard for a toxic air contaminant pursuant to §112 of the Federal Clean Air Act (42 USC §7412), such standard becomes the Airborne Toxic Control Measure (ATCM) for the toxic air contaminant. Once an ATCM has been adopted it becomes enforceable by the MDAQMD 120 days after adoption or implementation (Health & Safety Code §39666(d)). USEPA has not to date adopted a Maximum Achievable Control Technology (MACT) standard that is applicable to the proposed project. Should USEPA adopt an applicable MACT standard in the future, the MDAQMD will be required to enforce said MACT as an ATCM on the proposed project. MACT is also required for each major source of toxic air contaminants. MSP will not emit more than ten tons per year of any individual toxic air contaminant, and will not collectively emit more than 25 tons per year of all toxic air contaminants, so MACT is not required.

11. Conclusion

The MDAQMD has reviewed the proposed project's Application for New Source Review and subsequent supplementary information. The MDAQMD has determined that the proposed project, after application of the permit conditions (including BACT requirements) given below, will comply with all applicable MDAQMD Rules and Regulations. This PDOC will be released for public comment and publicly noticed on or after March 2, 2010. Written comments will be accepted for thirty days from the date of publication of the public notice. A Final Decision/Determination of Compliance shall be prepared no later than ten days after the end of the public comment period (approximately April 15, 2010).

Please forward any comments on this document to:

Eldon Heaston
Executive Director
Mojave Desert Air Quality Management District
14306 Park Avenue
Victorville, CA 92392-2310

12. Permit Conditions

The following permit conditions will be placed on the Authorities to Construct (ATC) for the project. Separate permits will be issued for each auxiliary boiler, HTF ullage/expansion tank, gas dispensing facility, cooling tower, fire pump and emergency generator. The electronic version of this document contains a set of conditions that are essentially identical for each of multiple pieces of equipment, differing only in MDAQMD permit reference numbers. The signed and printed ATCs will have printed permits (with descriptions and conditions) in place of condition language listings.

Auxiliary Boiler Authority to Construct Conditions

[Two – 21.5 MMBtu/hr Natural Gas Fired Auxiliary Boiler, Application Number: 00010710 and 0010711]

1. Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment shall be exclusively fueled with pipeline quality natural gas and shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. Emissions from this equipment shall not exceed the following hourly emission limits, verified by fuel use and an initial compliance test:
   a. NO_x as NO_2:
      0.237 lb/hr operating at 100% load (based on 9.0 ppmvd corrected to 3% O_2 and averaged over one hour)
   b. CO:
      0.817 lb/hr operating at 100% load (based on 50 ppmvd corrected to 3% O_2 and averaged over one hour)
   c. VOC as CH_4:
      0.231 lb/hr operating at 100% load
   d. SO_x as SO_2:
      0.0126 lb/hr operating at 100% load
   e. PM_{10}:
      0.159 lb/hr operating at 100% load

5. Prior to the expiration date each year, after the completion of construction the o/o shall have this equipment tuned, as specified by Rule 1157(I), Tuning Procedure.

6. The o/o shall maintain an operations log for this equipment on-site and current for a minimum of five (2) years, and said log shall be provided to District personnel on request. The operations log shall include the following information at a minimum:
   a. Cumulative annual fuel use in cubic feet or operation in hours;
   b. Annual tune-up verification;
   c. Results of annual compliance testing;

d. Any permanent changes made to the equipment that would affect air pollutant emissions, and indicate when changes were made.

7. The o/o shall perform initial compliance tests on this equipment in accordance with the MDAQMD Compliance Test Procedural Manual. The test report shall be submitted to the District within 180 days of initial start up:
   a. NO_x as NO_2 in ppmvd at 3% oxygen and lb/hr (measured per USEPA Reference Methods 19 and 20).
   d. CO in ppmvd at 3% oxygen and lb/hr (measured per USEPA Reference Method 10).

8. The o/o shall perform annual compliance tests on this equipment in accordance with the MDAQMD Compliance Test Procedural Manual. The test report shall be submitted to the District no later than six weeks prior to the expiration date of this permit. The following compliance tests are required:
   a. NO_x as NO_2 in ppmvd at 3% oxygen and lb/hr (measured per USEPA Reference Methods 19 and 20).
   b. VOC as CH_4 in ppmvd at 3% oxygen and lb/hr (measured per USEPA Reference Methods 25A and 18).
   c. SO_x as SO_2 in ppmvd at 3% oxygen and lb/hr.
   d. CO in ppmvd at 3% oxygen and lb/hr (measured per USEPA Reference Method 10).
   e. PM_{10} in mg/m^3 at 3% oxygen and lb/hr (measured per USEPA Reference Methods 5 and 202 or CARB Method 5).
   f. Flue gas flow rate in dscf per minute.
   g. Opacity (measured per USEPA reference Method 9).

9. Annual fuel usage shall not exceed 45.94 MMscf.

(HTF Ullage/Expansion system) Authority to Construct Conditions

[Two – HTF ullage/ expansion system, Application Number: 00010906 and 00010907]

1. Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. This system stores HTF, specifically the condensable fraction of the vapors vented from the ullage system.

4. This tank shall be operated at all times under a nitrogen blanket.

5. The ullage/expansion system nitrogen venting shall be carried out only through vents which have vapor condensing coolers which shall be maintained at or below 120 degrees Fahrenheit.

6. The HTF storage tank shall have in place a properly operating liquid HTF air cooler which shall maintain the tank at or below 165 degrees Fahrenheit.

7. The nitrogen condensing tanks shall be maintained at or below 176 degrees Fahrenheit.

8. Vent release and HTF storage tank temperatures shall be monitored in accordance with a District approved Inspection, Monitoring and Maintenance plan.

9. The o/o shall establish an inspection and maintenance program to determine, repair, and log leaks in HTF piping network and expansion tanks. Inspection and maintenance program and documentation shall be available to District staff upon request.
   a. All pumps, compressors and pressure relief devices (pressure relief valves or rupture disks) shall be electronically, audio, or visually inspected once every operating day.
   b. All accessible valves, fittings, pressure relief devices (PRDs), hatches, pumps, compressors, etc. shall be inspected quarterly using a leak detection device such as a Foxboro OVA 108 calibrated for methane.
   c. VOC leaks greater than 100-ppmv shall be tagged (with date and concentration) and repaired within seven calendar days of detection.
   d. VOC leaks greater than 10,000-ppmv shall be tagged and repaired within 24-hours of detection.
   e. Permittee shall maintain a log of all VOC leaks exceeding 10,000-ppmv, including location, component type, and repair made.
   f. Permittee shall maintain record of the amount of HTF replaced on a monthly basis for a period of 5 years.
   g. Any detected leak exceeding 100-ppmv and not repaired in 7-days and 10,000-ppmv not repaired within 24-hours shall constitute a violation of this Authority to Construct ATC)/Permit to Operate (PTO).
   h. Pressure sensing equipment shall be installed that will be capable of sensing a major rupture or spill within the HTF network..

10. If current non-criteria substances become regulated as toxic or hazardous substances and are used in this equipment, the owner/operator (o/o) shall submit to the District a plan demonstrating how compliance will be achieved and maintained with such regulations.

Cooling Tower Authority to Construct Conditions

[Two Cooling Towers, Application Number: 00010947 and 00010948]

1. Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. The drift rate shall not exceed 0.0005 percent with a maximum circulation rate of 90,000 gallons per minute. The maximum hourly PM_{10} emission rate shall not exceed 2.24 pounds per hour, as calculated per the written District-approved protocol.

4. The operator shall perform weekly tests of the blow-down water total dissolved solids (TDS). The average TDS shall not exceed 9,968 ppm on a calendar monthly basis.

5. The operator shall conduct all required cooling tower water tests in accordance with a District-approved test and emissions calculation protocol. Thirty (30) days prior to the first such test the operator shall provide a written test and emissions calculation protocol for District review and approval.

6. This equipment shall not be operated for more than 5,840 hours per rolling twelve month period and more than 16 hours per calendar day.

7. The o/o shall maintain an operations log for this equipment on-site and current for a minimum of five (5) years, and said log shall be provided to District personnel on request. The operations log shall include the following information at a minimum:
   a. Total operation time (hours per day, hours per month, and hours per rolling twelve month period); and
   b. The date and result of each blow-down water test in TDS ppm, and the resulting mass emission rate

8. A maintenance procedure shall be established that states how often and what procedures will be used to ensure the integrity of the drift eliminators. This procedure is to be kept on-site and available to District personnel on request.

Emergency Generator Authority to Construct Conditions

[Two – 4,190 hp emergency IC engine each driving a generator, Application Number: 00010712 and 00010713]

1. This equipment shall be installed, operated and maintained in strict accord with those recommendations of the manufacturer/supplier and/or sound engineering principles which produce the minimum emissions of contaminants. Unless otherwise noted, this equipment shall also be operated in accordance with all data and specifications submitted with the application for this permit.

2. This unit shall only be fired on ultra-low sulfur diesel fuel, whose sulfur concentration is less than or equal to 0.0015% (15 ppm) on a weight per weight basis per CARB Diesel or equivalent requirements.

3. A non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed and maintained on this unit to indicate elapsed engine operating time. (Title 17 CCR §93115.10(e)(1)).

4. This unit shall be limited to use for emergency power, defined as in response to a fire or when commercially available power has been interrupted. In addition, this unit shall be operated no more than 0.5 hrs per day for a total of 50 hours per year for testing and maintenance, excluding compliance source testing. Time required for source testing will not be counted toward the 50 hour per year limit.

5. The owner/operator (o/o) shall maintain a operations log for this unit current and on-site, either at the engine location or at a on-site location, for a minimum of two (2) years, and for another year where it can be made available to the District staff within 5 working days from the District's request, and this log shall be provided to District, State and Federal personnel upon request. The log shall include, at a minimum, the information specified below:
   a. Date of each use and duration of each use (in hours);
   b. Reason for use (testing & maintenance, emergency, required emission testing);
   c. Calendar year operation in terms of fuel consumption (in gallons) and total hours; and,
   d. Fuel sulfur concentration (the o/o may use the supplier's certification of sulfur content if it is maintained as part of this log).

6. This unit shall not be used to provide power during a voluntary agreed to power outage and/or power reduction initiated under an Interruptible Service Contract (ISC); Demand Response Program (DRP); Load Reduction Program (LRP) and/or similar arrangement(s) with the electrical power supplier.

7. This engine may operate in response to notification of impending rotating outage if the area utility has ordered rotating outages in the area where the engine is located or expects to order such outages at a particular time, the engine is located in the area subject to the rotating outage, the engine is operated no more than 30 minutes prior to the forecasted outage, and the engine is shut down immediately after the utility advises that the outage is no longer imminent or in effect.

8. This unit is subject to the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (Title 17 CCR 93115). In the event of conflict between these conditions and the ATCM, the more stringent shall govern.

9. This unit is subject to the requirements of the Federal National Source Performance Standards (NSPS) for Stationary Compression Ignition Internal Combustion Engines (40 CFR Part 60 Subpart IIII).

Emergency Fire Suppression Water Pump Authority to Construct Conditions

[Two - 346 hp emergency IC engine each driving a fire suppression water pump, Application Number: 00010714 and 00010715]

1. This equipment shall be installed, operated and maintained in strict accord with those recommendations of the manufacturer/supplier and/or sound engineering principles which produce the minimum emissions of contaminants. Unless otherwise noted, this equipment

shall also be operated in accordance with all data and specifications submitted with the application for this permit.

2. This unit shall only be fired on ultra-low sulfur diesel fuel, whose sulfur concentration is less than or equal to 0.0015% (15 ppm) on a weight per weight basis per CARB Diesel or equivalent requirements.

3. A non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed and maintained on this unit to indicate elapsed engine operating time. (Title 17 CCR §93115.10(e)(1)

4. This unit shall be limited to use for emergency power, defined as in response to a fire or due to low fire water pressure. In addition, this unit shall be operated no more than 50 hours per year for testing and maintenance, excluding compliance source testing. Time required for source testing will not be counted toward the 50 hour per year limit. The 50 hour limit can be exceeded when the emergency fire pump assembly is driven directly by a stationary diesel fueled CI engine operated per and in accord with the National Fire Protection Association (NFPA) 25 - "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems," 1998 edition. This requirement includes usage during emergencies. {Title 17 CCR 93115.3(n)}

5. The owner/operator (o/o) shall maintain a operations log for this unit current and on-site, either at the engine location or at a on-site location, for a minimum of two (2) years, and for another year where it can be made available to the District staff within 5 working days from the District's request, and this log shall be provided to District, State and Federal personnel upon request. The log shall include, at a minimum, the information specified below:
   a. Date of each use and duration of each use (in hours);
   b. Reason for use (testing & maintenance, emergency, required emission testing);
   c. Calendar year operation in terms of fuel consumption (in gallons) and total hours; and,
   d. Fuel sulfur concentration (the o/o may use the supplier's certification of sulfur content if it is maintained as part of this log).

7. This unit is subject to the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (Title 17 CCR 93115). In the event of conflict between these conditions and the ATCM, the requirements of the ATCM shall govern.

8. This unit is subject to the requirements of the Federal National Source Performance Standards (NSPS) for Stationary Compression Ignition Internal Combustion Engines (40 CFR Part 60 Subpart IIII).

Non-retail Gasoline Dispensing Facility Authority to Construct Conditions

[One – above ground gasoline storage tank and fuel receiving and dispensing equipment Application Number: 00010995]

1. The toll-free telephone number that must be posted is 1-800-635-4617.

2. The owner/operator (o/o) shall maintain a log of all inspections, repairs, and maintenance on equipment subject to Rule 461. Such logs or records shall be maintained at the facility for at least two (2) years and shall be available to the District upon request.

3 Any modifications or changes to the piping or control fitting of the vapor recovery system require prior approval from the District.

4. The gasoline vapor vent pipe(s) are to be equipped with pressure relief valve(s) per applicable CARB requirements.

5. The o/o shall perform the following tests within 60 days of construction completion and annually thereafter in accordance with the applicable CARB test methods.

The District shall be notified a minimum of 10 days prior to performing the required tests with the final results submitted to the District within 30 days of completion of the tests.

The District shall receive passing test reports no later than six (6) weeks prior to the expiration date of this permit.

6. The annual throughput of gasoline shall not exceed 25,000 gallons per year. Throughput Records shall be kept on site and available to District personnel upon request. Before this annual throughput can be increased the facility may be required to submit to the District a site specific Health Risk Assessment in accord with a District approved plan. In addition public notice and/or comment period may be required.

7. The applicant shall install, operate, and maintain CARB approved Phase I and Phase II vapor recovery systems on the proposed facility gasoline tank and dispensing system. The Phase I and Phase II vapor recovery systems will meet all applicable CARB standards at the time of installation for the systems selected.

8. The California Air Resources Board (CARB) has established a timeline for Aboveground Storage Tanks (AST) Enhanced Vapor Recovery (EVR) system implementation. Pursuant to CARB requirements and State mandated retrofits, the o/o shall ensure that this tank meets all the applicable requirements within the designated timeframes. Prior to conducting any modifications the o/o shall obtain a District approved Authority to Construct (ATC) Permit. See the following link for AST EVR Timeline: http://o3.arb.ca.gov/vapor/asttimeline_123009.pdf

Appendix - MSP Emissions Calculations

Table C.1-1 Boilers #1 and #2
Calculation of Criteria Pollutant Emissions for Boilers Firing Gaseous Fuels

Boiler Operation Mode: Normal firing mode — # of Units: 2
Ops Hr/Day: 24 Worst Case — Fuel Type: Nat Gas
Ops Hr/Yr: 4380

Calculation of Criteria Pollutant Emissions from Each Identical Unit

Compound	Emission Factor, lb/MMscf (1)	Maximum Hourly Emissions, lb/hr (2)	Maximum Daily Emissions, lb/day	Maximum Annual Emissions, lbs/yr	Annual Emissions, ton/yr (3)	All Units: Maximum Hourly Emissions, lb/hr	All Units: Maximum Daily Emissions, lb/day	All Units: Maximum Annual Emissions, lbs/yr	All Units: Annual Emissions, ton/yr
NOx	1.13E+01	2.37E-01	5.68E+00	5.18E+02	2.59E-01	4.73E-01	1.14E+01	1.04E+03	5.18E-01
CO	3.90E+01	8.17E-01	1.96E+01	1.79E+03	8.95E-01	1.63E+00	3.92E+01	3.58E+03	1.79E+00
VOC	1.10E+01	2.31E-01	5.54E+00	5.05E+02	2.53E-01	4.61E-01	1.11E+01	1.01E+03	5.05E-01
SOx	6.00E-01	1.26E-02	3.02E-01	2.76E+01	1.38E-02	2.52E-02	6.04E-01	5.51E+01	2.76E-02
PM10	7.60E+00	1.59E-01	3.83E+00	3.49E+02	1.75E-01	3.19E-01	7.65E+00	6.98E+02	3.49E-01
PM2.5	7.60E+00	1.59E-01	3.83E+00	3.49E+02	1.75E-01	3.19E-01	7.65E+00	6.98E+02	3.49E-01
	lbs/mmbtu								
CO2	1.17E+02	2.51E+03	6.03E+04	1.10E+07	5.51E+03	5.03E+03	1.21E+05	2.20E+07	1.10E+04
Methane	1.30E-02	2.80E-01	6.71E+00	1.22E+03	6.12E-01	5.59E-01	1.34E+01	2.45E+03	1.22E+00
N2O	2.21E-04	4.74E-03	1.14E-01	2.08E+01	1.04E-02	9.48E-03	2.28E-01	4.15E+01	2.08E-02
CO2e									1.10E+04

Notes:
(1) natural gas criteria pollutant EF factors
(2) Based on maximum hourly boiler fuel use of 21.5 MMBtu/hr/boiler
and fuel HHV of 1025 Btu/scf gives 0.0210 MMscf/hr/boiler.
(3) Based on maximum annual boiler fuel use of * 47,085 MMBtu/yr/boiler
and fuel HHV of 1025 Btu/scf gives 45.9366 MMscf/yr/boiler.
(4) LNBs only with GCPs
(5) PM2.5 = PM10

Refs:
(1) EFs from AP-42, Section 1.4, 7/98, and SCAQMD Rules 1146, and 1146.1.
(2) GHG EFs from CCAR General Protocol, June 2006.
*hourly and daily calculated at 100% load, annual at 50% load.

Diesel Fire Pump

App No.	Equipment	bhp	Max Day Hours	Annual Hours	EmFac pounds/hour NOx	CO	VOC	SO2	PM10	Max Daily (pounds) NOx	CO	VOC	SO2	PM10	Max Annual (pounds) NOx	CO	VOC	SO2	PM10
10714	John Deere	346	*2*	*50*	2.14	1.98	0.15	0.002	0.11	4.3	4.0	0.3	0.0	0.2	106.8	99.2	7.6	0.1	5.7
10715	John Deere	346	*2*	*50*	2.14	1.98	0.15	0.002	0.11	4.3	4.0	0.3	0.0	0.2	106.8	99.2	7.6	0.1	5.7
								total pounds:		8.5	7.9	0.6	0.0	0.5	106.8	99.2	7.6	0.1	5.7
								total tons:		0.0	0.0	0.0	0.0	0.0	***0.053***	***0.050***	***0.004***	***0.000***	***0.003***

Substance	EmFac gm/bhp-hr Engine #1&2
NOx	2.8
CO	2.6
VOC	0.20
SO2	0.002
PM10	0.15

	EmFac lb/1000 gals	lb/yr
DPM	7.85E+00	*6E+00*
Formaldehyde	1.73E+00	*2E+00*
Acetaldehyde	7.83E-01	*8E-01*
1,3-Butadiene	2.17E-01	*2E-01*
Acrolein	3.39E-02	*3E-02*
Mercury	2.30E-03	*2E-03*
Nickel	3.90E-03	*4E-03*
Arsenic	7.80E-03	*8E-03*
Cadmium	1.50E-03	*2E-03*
Chromium hexavalent	2.00E-04	*2E-04*

Notes:

Tier 3

Criteria emissions data except SOx from manufacturer, toxics from MDAQMD. Diesel PM equal to PM10

Estimated SOX emission factor calculated from estimated max fuel consumption rate, calculated below:

20 gal/hr X 7.21 lbs/gal X 453.59 g/lb X 0.0015/100 (sulfur) X 1/303 bhp X 64.0 0.002 g/bhp-hr

Stack height in model 46 feet

Will not be tested same day as genset's

Diesel Emergency Generator

App No.	Equipment	bhp	Max Day Hours	Annual Hours	EmFac pounds/hour NOx	CO	VOC	SO2	PM10	Max Daily (pounds) NOx	CO	VOC	SO2	PM10	Max Annual (pounds) NOx	CO	VOC	SO2	PM10
10713	Caterpillar	4190	*0.5*	*26*	46.65	3.79	0.92	0.04	0.37	23.3	1.9	0.5	0.0	0.2	1212.9	98.5	24.0	1.0	9.6
10714	Caterpillar	4190	*0.5*	*26*	46.65	3.79	0.92	0.04	0.37	23.3	1.9	0.5	0.0	0.2	1212.9	98.5	24.0	1.0	9.6
								total pounds:		46.6	3.8	0.9	0.0	0.4	2425.7	196.9	48.0	1.9	19.2
								total tons:		0.0	0.0	0.0	0.0	0.0	***1.213***	***0.098***	***0.024***	***0.001***	***0.010***

Substance	EmFac gm/bhp-hr Engine #1&2
NOx	5.05
CO	0.41
VOC	0.10
SO2	0.004
PM10	0.04

	EmFac lb/1000 gals	lb/yr
*DPM	7.85E+00	1E+01
Formaldehyde	1.73E+00	1E+01
Acetaldehyde	7.83E-01	7E+00
1,3-Butadiene	2.17E-01	2E+00
Acrolein	3.39E-02	3E-01
Mercury	2.30E-03	2E-02
Nickel	3.90E-03	3E-02
Arsenic	7.80E-03	7E-02
Cadmium	1.50E-03	1E-02
Chromium hexavalent	2.00E-04	2E-03

Notes:

Tier 3

Criteria emissions data except SOx from manufacturer. Toxics from MDAQMD. Diesel PM equal to PM10.

Estimated SOX emission factor calculated from estimated max fuel consumption rate, calculated below:

173.3 gal/hr X 7.21 lbs/gal X 453.59 g/lb X 0.0015/100 (sulfur) X 1/4190 bhp X 64.06 gSO2/32.06gS = 0.004 g/bhp-hr

Stack height in model 46 feet

Table C.1-5 Cooling Towers #1 and #2

Cooling Tower Particulate Emissions

# of Identical Towers:	2			**Per Tower**	**Per Cell**	**All Towers**
Operational Schedule:	Hrs/day	Days/Yr	Hrs/Yr			
	16	365	5840			
Pumping rate of recirculation pumps (gal/min)				90,000.0		
Flow of cooling water (lbs/hr)				44,982,000.0		
Avg TDS of circ water (mg/l or ppmw)				9,968.0		
Flow of dissolved solids (lbs/hr)				448380.58		
Fraction of flow producing drift				1.00		
Control efficiency of drift eliminators,	0.0005			0.000005		
Calculated drift rate (lbs water/hr)				224.9		
PM10 emissions (lbs/hr)				**2.24**	**0.37**	**4.48**
PM10 emissions (lbs/day)				**35.87**	**5.98**	**71.74**
PM10 emissions (tpy)				**6.55**	**1.09**	**13.09**
PM2.5 fraction of PM10 per CARB CEIDARS App A.				1.00		
PM2.5 emissions (lbs/hr)				**2.24**	**0.37**	**4.48**
PM2.5 emissions (lbs/day)				**35.87**	**5.98**	**71.74**
PM2.5 emissions (tpy)				**6.55**	**1.09**	**13.09**

Notes:
Based on Method AP 42, Section 13.4, Jan 1995

Cooling Tower Stack Parameters

Base Elevation	2060	feet amsl
Number of Cells	6	
Length of Cooling Tower	325.00	feet
Width of Cooling Tower	54.00	feet
Height of Cooling Tower (to fan deck)	37.00	feet agl
Cell Release Height (fan shroud exit)	51.00	feet agl
Flow/Fan Discharge for each Cell	1,310,000	ACFM
Inlet air temperature (ambient):	variable	deg F
Discharge air temperature:	variable	deg F

HTF Ullage/Expansion System

Daily hrs 8 Annual hrs 2920

Tanks/Venting

VOC Emissions

	lbs/hr	lbs/day	lbs/yr	**tpy**
	1.14	9.10	3322.00	1.66
Totals	1.14	9.10	3322.00	1.66

HAP Emissions

	lbs/hr	lbs/day	lbs/yr
benzene	0.463	3.70	1350
toluene	0.0325	0.26	95
phenol	0.005	0.04	14.6
biphenyl	0.172	1.38	504

HTF System Component Count and Fugitve Emissions Estimate

Mohave Solar Project

Component	Count #	Service	EF lb/hr/src	Hrs/day	lbs/hr	lbs/day	lbs/yr	tons/yr
Valves								
Sealed Bellows	0	Gas/Vapor & Lt. Liquid	0	0	0.000	0.000	0.000	0.000
AQMD Approved I&M	0	Fuel/N.Gas	0	0	0.000	0.000	0.000	0.000
	0	Gas Vapor	0	0	0.000	0.000	0.000	0.000
	3247	Lt. Liquid	0.00000108	16	0.004	0.056	20.479	0.010
	0	Hvy. Liquid	0	0	0.000	0.000	0.000	0.000
Pumps								
Sealess Type	0	Lt. Liquid	0	0	0.000	0.000	0.000	0.000
Double Mech Seals or Equivalent	24	Lt. Liquid	1.6535E-05	16	0.000	0.006	2.318	0.001
Single Mech Seal	0	Hvy. Liquid	0	0	0.000	0.000	0.000	0.000
Compressors	0	Gas/Vapor	0	0	0.000	0.000	0.000	0.000
Flanges/Connectors	1550	All	1.345E-06	16	0.002	0.033	12.175	0.006
PRVs	16	Gas	0.01242	8	0.199	1.590	580.262	0.290
Process Drains	0	All	0	0	0.000	0.000	0.000	0.000
Open-ended Lines	0	Lt. Liquid	0.003307	0	0.000	0.000	0.000	0.000
				Totals	0.20	1.69	615.23	0.31
Operating Days/Yr:	365							

Decomposition By Products:

Comment	CAS #	Substance ID	% wt of Total VOC	Fraction of VOC, wt	lbs/hr	lbs/day	lbs/yr	tons/yr
MSDS Trace Amount	71432	Benzene	1	0.01	0.002	0.017	6.152	0.003
MSDS Trace Amount	108952	Phenol	2.5	0.025	0.005	0.042	15.381	0.008
HTF Composition Val	92524	Biphenyl	26.5	0.265	0.054	0.447	163.037	0.082
			0	0	0.000	0.000	0.000	0.000
		***	0	0	0.000	0.000	0.000	0.000

Notes:

(1) TTECI HTF memo dated 2-16-10.

(2) VOC BACT is accepted as achieved in practice.

(3) Decomposition data from HTF manufacturer (Solutia) and related MSDS.

(4) All drains, vents, and inline relief valves are capped and they are included as "connectors".

(5) In line relief valves relieve light liquid from high pressure to successively lower pressures.

(6) The only relief valves to atmosphere are from Nitrogen blanketed vapor space (gas) on tanks and cleaning system.

(7) Protocol for Equipment Leak Emissions Estimates, EPA 453-R-95-017, 11/95.

Gas Dispensing Facility-Non-retail, above ground ("Code 4")

			Emission Factors (pound								
Facility Design			VOC			Benzene			Ethylbenzene		
Tank Location	Control system	Code	Vapor	Liquid	Total	Vapor	Liquid	Total	Vapor	Liquid	Total
Above Ground	None	1	18.90	0.61	19.51	0.0567	0.0061	0.0628	0.0000	0.0098	0.0098
	Phase I Only	2	10.92	0.61	11.53	0.0328	0.0061	0.0389	0.0000	0.0098	0.0098
	Phase I & II without Vent Values	3	1.26	0.42	1.68	0.0038	0.0042	0.0080	0.0000	0.0067	0.0067
	Phase I & II with Vent Values	4	1.10	0.42	1.52	0.0033	0.0042	0.0075	0.0000	0.0067	0.0067
Under Ground	None	5	17.64	0.61	18.25	0.0529	0.0061	0.0590	0.0000	0.0098	0.0098
	Phase I Only	6	9.66	0.61	10.27	0.0290	0.0061	0.0351	0.0000	0.0098	0.0098
	Phase I with Vent Values	7	8.69	0.61	9.30	0.0261	0.0061	0.0322	0.0000	0.0098	0.0098
	Phase I & II without Vent Values	8	1.26	0.42	1.68	0.0038	0.0042	0.0080	0.0000	0.0067	0.0067
	Phase I & II with Vent Values	9	0.85	0.42	1.27	0.0025	0.0042	0.0067	0.0000	0.0067	0.0067

Toxic substance	Percent by Weight	
	Vapor	Liquid
Benzene	0.3	1.0
Ethylbenzene	0.0	1.6
Methyl Tertiary Butyl Ether	0.0	11.0
Toluene	0.0	8.0
Xylene (Total)	0.0	2.4

Annual Throughput 25,000.00 gallons

Pollutants / Substance Name	CAS	Category	Emission Factor lbs/1,000 gal	Emission Rates
Criteria Pollutants				tpy
Reactive Organic Gases		ROG	1.52	0.02
Toxic Substances				lbs/yr
Benzene	71432	VOC	0.0075	0.19
Ethylbenzene	100414	VOC	0.0067	0.17
Methyl Tertiary Butyl Ether	1634044		0.0462	1.16
Toluene	108883	VOC	0.0336	0.84
Xylene (Total)	1210	VOC	0.0101	0.25

Maximum Annual Emissions by Operation Hours

Powerblock A	Hrs	NOx	CO	VOC	SOx	PM10/PM2.5
Auxilliary Boiler[1]	4380	0.1	0.4	0.1	0.0	0.1
Fire Pump Engine	50	2.1	2.0	0.2	0.0	0.1
Emergency Electrical Generator	26	46.6	3.8	0.9	0.0	0.4
Cooling Tower	5840	0.0	0.0	0.0	0.0	2.2
HTF Ullage/Expansion System	2920	0.0	0.0	0.6	0.0	0.0
Powerblock B						
Auxilliary Boiler[1]	4380	0.1	0.4	0.1	0.0	0.1
Fire Pump Engine	50	2.1	2.0	0.2	0.0	0.1
Emergency Electrical Generator	50	46.6	3.8	0.9	0.0	0.4
Cooling Tower	5840	0.0	0.0	0.0	0.0	2.2
HTF Ullage/Expansion System	2920	0.0	0.0	0.6	0.0	0.0
Location TBD						
Gas Storage/Dispensing	Annual	0.0	0.0	38.1	0.0	0.0
Facility Annual Total (pounds)		4795	4065	4456	58	26923
Facility Annual Total (tons)		**2.4**	**2.0**	**2.2**	**0.03**	**13.5**

Maximum Daily Emissions by Operation Hours

Powerblock A	Hrs	NOx	CO	VOC	SOx	PM10/PM2.5
Auxilliary Boiler	24	0.2	0.8	0.2	0.0	0.2
Fire Pump Engine	2	4.3	4.0	0.3	0.0	0.2
Emergency Electrical Generator	0.5	23.3	1.9	0.5	0.0	0.2
Cooling Tower	16	0.0	0.0	0.0	0.0	2.2
HTF Ullage/Expansion System	8	0.0	0.0	0.6	0.0	0.0
Powerblock B						
Auxilliary Boiler	24.0	0.2	0.8	0.2	0.0	0.2
Fire Pump Engine	2	4.3	4.0	0.3	0.0	0.2
Emergency Electrical Generator	0.5	23.3	1.9	0.5	0.0	0.2
Cooling Tower	16	0.0	0.0	0.0	0.0	2.2
HTF Ullage/Expansion System	8	0.0	0.0	0.6	0.0	0.0
Location TBD	gallons					
Gas Storage/Dispensing[2]	50	0	0	0.076	0	0
Facility Daily Total (pounds)		52	57	22	1	80

Notes;

[1] Annual aux boiler emissions limited by basing calculations on 50% load.

[2]GDF daily estimated using applicant proposal of 1500 gal/month divided by 30 days

Mojave Solar Project	NOx	CO	VOC	SOx	PM10
Max Annual (tons)	2.4	2.0	2.2	0.03	13.5
Max Daily (pounds)	51.8	57.0	21.9	0.6	80.5

CAS Number	Chemical Name	HAP	lbs/yr
75070	Acetaldehyde	Yes	7.58
107028	Acrolein	Yes	0.34
7429905	Aluminum	TAC	0.31
7664417	Ammonia	TAC	0.00
7440382	Arsenic	Yes	0.15
71432	Benzene	Yes	1356.34
92524	Biphenyl	Yes	667.04
106990	1,3-Butadiene	Yes	2.10
7440439	Cadmium	Yes	0.05
7440473	Chromium	Yes	0.08
7440508	Copper	TAC	0.11
100414	Ethylbenzene	Yes	0.17
50000	Formaldehyde	Yes	16.69
110543	Hexane	Yes	0.01
7439921	Lead	Yes	0.05
7439965	Manganese	Yes	38.51
7439976	Mercury	Yes	0.000003
91203	Naphthalene	Yes	0.0005
7440020	Nickel	Yes	0.10
1150	PAHs (4)	Yes	0.0002
108952	Phenol	Yes	29.98
115071	Propylene	TAC	0.89
75569	Propylene oxide	Yes	0.00
7782492	Selenium	Yes	0.20
7440224	Silver	TAC	0.03
108883	Toluene	Yes	95.90
1330207	Xylene	Yes	0.29
7440666	Zinc	TAC	0.62
9901	Diesel PM	TAC	15.33