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August 29, 2011

Craig Hoffman
Compliance Project Manager
(09-AFC-03C)
Siting, Transmission and Environmental Protection (STEP) Division
California Energy Commission
1516 Ninth Street, MS-2000
Sacramento, CA 95814

RE: Petition for Staff Approved Project Changes for the Mariposa Energy Project (09-AFC-03)

Dear Mr. Hoffman:

On behalf of Mariposa Energy, LLC (Mariposa Energy or "Project Owner"), I am writing to request Staff Approval of very minor changes in the general plant arrangement for the Mariposa Energy Project (MEP). These very minor changes will not prevent or interfere with the project's ability to comply with the conditions of certification and will not result in any significant adverse environmental impacts.

Based on a review of the air dispersion modeling and health risk assessment results for the revised general arrangement plan, the project will comply with all applicable AAQSs. Furthermore, the revised general arrangement would not alter the basis for Commission approval of the project nor require any changes to the final Conditions of Certification. Therefore, Mariposa Energy is requesting concurrence that these changes do not require an amendment to the MEP license and requests Staff approval of the revised MEP general arrangement presented in Attachment 1.

If you have any questions regarding this submittal, please do not hesitate to contact me at (916) 447-2166 or Chris Curry at (213) 346-2134.

Sincerely,

Gregg Wheatland

MARIPOSA ENERGY PROJECT APPLICATION FOR STAFF APPROVED PROJECT CHANGES

As required by Section 1769 of the CEC Siting Regulations, Project Owner hereby submits the following information in support of these staff approved project changes.

Pursuant to Section 1769 (a)(1)(A) and (B), this section provides a complete description of the proposed modifications, including new language for affected conditions, and the necessity for the modifications.

During the final design phase of MEP, Mariposa Energy's engineering contractor determined that the general arrangement drawing included in the Application for Certification (AFC) (Figure 2.3-1) required minor revisions, including the slight shifting of the location of the water storage tanks near the firewater pump, and very minor adjustments to the location, orientation, and configuration of certain other structures and equipment. The water storage tanks require moving because it was determined during the detailed tank foundation design that the footing area had to be larger than the actual tank footprint in order to reduce the soil bearing to allowable levels and prevent seismic overturning. Alternative designs of increasing the depth of the footings or combining the tank foundations did not relieve this condition, so the tank foundation centerlines had to be spaced slightly further apart.

Because the slight change in the location of these structures could potentially alter the results of the air dispersion analysis performed for project licensing, CH2M HILL conducted an air dispersion modeling analysis. This analysis confirms that the project will still comply with all applicable ambient air quality standards and will not result in any significant air quality impacts. A detailed summary of the modifications to the general arrangement, and results from the ambient air quality analysis, are presented below.

Summary of the Proposed General Arrangement Revisions

It is important to note that while Mariposa Energy is proposing to slightly move the water tanks, and slightly relocate several buildings and ancillary equipment, there are no proposed changes to the location of the combustion turbine exhaust or the firewater pump exhaust stacks identified in the Final Decision. The following is a list of the minor revisions to the locations of the buildings and equipment compared to the general arrangement equipment layout used during the licensing proceeding and the air dispersion modeling analysis used as the basis for the Commission Decision. The proposed general arrangement plan for MEP is included as Attachment 1.

- The wastewater tank move approximately 22 feet southwest.
- The demineralized water tank move approximately 31 feet southwest.
- The raw water tank move approximately 11 feet southwest.
- The fuel gas compressor skids will move approximately 30 feet northwest.
- The Warehouse and Maintenance Building move approximately 50 feet southeast.
- The gas metering station move approximately 80 feet west.
- The 230-kilovolt (kV) circuit breakers, 230-kV disconnect switch, and the generator stepup transformers will each move approximately 20 to 120 feet southwest, respectively.

• Orientation of the power distribution center, auxiliary transformers, and station transformers are rotated 90 degrees counter clockwise.

• The single-unit chiller package will be replaced with a four-unit chiller package. The chiller package will move approximately 43 feet southwest. The original chiller module arrangement depicted on the general arrangement was based on one of multiple potential manufacturers. Chiller module sizes and arrangements vary among potential suppliers, and the current arrangement was not known until final vendor selection was completed. During final bidding, the vendor retracted the design offer originally shown, and the four-unit chiller package shown is the final design selected for the project.

• The four Continuous Emissions Monitoring System (CEMS) shelters move to the southeast side of each stack 25 feet to avoid underground electrical conduit and piping runs. This placement also creates better access for the crane required to service the ECM catalyst during maintenance activities.

Significantly, these minor changes in the General Plant Arrangement do not require any changes in the text of the Commission decision or changes in any Conditions of Certification.

Pursuant to Section 1769(a)(1)(C), a discussion is required if the modification is based on information that was known by the petitioner during the certification proceeding, and an explanation of why the issue was not raised at that time.

The need for these changes is based on information that became known to the petitioner after the close of the certification proceeding – specifically, (1) final engineering drawings addressing a request from PG&E to relocate the gas metering station to provide PG&E unrestricted 24 hour access to the facility, (2) final engineering drawings which required slight adjustments in the location of tanks and other structures to ensure spacing between structures in accordance with building codes, and (3) a change in chiller packages when a vendor retracted a bid during final vendor selection.

Pursuant to Section 1769(a)(1)(D), a discussion is required on whether the modification is based on new information that changes or undermines the assumptions, rationale, findings, or other bases of the final decision, and explanation of why the change should be permitted.

These minor changes in the General Plan Arrangement do not change or undermine the assumptions, rationale, findings, or other bases of the final decision. These changes should be permitted as there are no significant impacts resulting from these changes. Each of these changes will improve the safe and efficient operation of the Project.

Pursuant to Section 1769(a)(1)(E), an analysis of the impacts the modifications may have on the environment and proposed measures to mitigate any significant adverse impacts is required.

The proposed changes do not require changes to the environmental baseline information as described in the Application for Certification.

The additional air quality and public health analyses confirm that the project will still comply with all applicable ambient air quality standards and will not result in any significant air quality or public health impacts. The chiller package represents one of the noise sources associated with the licensed project. However, the noise from the project, as modified, will remain below all applicable noise standards and the selection of an alternate chiller package does not require a modification to the Conditions of Certification for noise. Therefore, the facility will continue to meet all existing environmental standards and there will be no significant adverse environmental impacts.

Updated Criteria Pollutant and Health Risk Analysis

As previously stated, there are no proposed changes to the permitted turbine and fire pump stack locations. Therefore, the Building Profile Input Program (BPIP) was used to determine whether or not the proposed changes to the surrounding buildings and equipment would affect the dispersion modeling results. Based on the results of the BPIP analysis, it was determined that the proposed changes would not affect the dispersion modeling results associated with the turbine emissions but that the proposed revisions had the potential to affect the results associated with the diesel fire pump emissions.

In addition to the potential impacts to the results associated with the BPIP changes, a more recent version of AERMOD has been released since the preparation of the AFC. Therefore, a turbine load analysis was conducted to verify that the new AERMOD version would result in impacts identical to those of the older version. The results of the load analysis test confirmed that results for both versions were identical for the combustion turbines.

Therefore, based on the results of the BPIP analysis and the updated AERMOD version analysis, it is concluded that the turbine commissioning impacts will not be affected by the proposed general arrangement revision. It follows that because the modeled turbine impacts are not affected by the proposed general arrangement revision, the localized cumulative impacts will also not be affected. Therefore, the operational impacts were further evaluated as part of the updated criteria pollutant and health risk analysis.

Operational and air dispersion modeling for the revised MEP general arrangement was performed using the methodology described in the AFC, with exceptions to the following:

- An updated version of the U.S. Environmental Protection Agency (EPA)-approved dispersion model, AERMOD (Version 11103), was used for the revised air dispersion modeling. The meteorological data were consistent with the previous analysis.
- The 1-hour NO_2 modeling was performed using the ozone limiting method (OLM), as outlined by the San Joaquin Valley Air Pollution Control District (SJVAPCD).[1] This methodology is consistent with EPA guidance[2] for use of AERMOD OLM and the approach presented in the Commission Decision.

[1] *Assessment of Non-Regulatory Options in AERMOD Specifically OLM and PVMRM*, SJVAPCD, 2010

[2] *Additional Clarification Regarding Application of the Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard.* USEPA, Research Triangle Park. March 2011.

Operational Impact Analysis

In order to evaluate the worst-case air quality impacts for the revised equipment layout, dispersion modeling was conducted at 50 percent load at 93°F ambient temperature and 100 percent load at 59°F ambient temperature for short-term and annual averaging times, respectfully. The 50 percent load and 93°F scenario for short-term averaging periods was chosen because this load resulted in the maximum impacts during the turbine load analysis. The 100 percent load and 59°F scenario was chosen because it represents average annual conditions. Parameters and emission rates for these scenarios are presented in Table 1.[3] Detailed emissions data for the turbines and fire pump engine can be found in Attachment 2.

TABLE 1
Maximum Emission Rates Used for the Refined Grid AERMOD Model Runs

	Turbine 1[a] (lb/hr)	Turbine 2[a] (lb/hr)	Turbine 3[a] (lb/hr)	Turbine 4[a] (lb/hr)	Fire Pump Engine[b] (lb/hr)
NO_2					
1-hour	18.506	18.506	18.506	18.506	0.62
Annual	2.493	2.493	2.493	2.493	0.00704
CO					
1-hour	17.319	17.319	17.319	17.319	0.29
8-hour	7.968	7.968	7.968	7.968	--
SO_2					
1-hour	0.910	0.910	0.910	0.910	0.00121
3-hour	0.910	0.910	0.910	0.910	0.000403
24-hour	0.910	0.910	0.910	0.910	0.0000504
Annual	0.1625	0.1625	0.1625	0.1625	0.0000138
PM_{10}					
24-hour	2.50	2.50	2.50	2.50	0.00112
Annual	1.206	1.206	1.206	1.206	0.000307
$PM_{2.5}$					
24-hour	2.50	2.50	2.50	2.50	0.00112
Annual	1.206	1.206	1.206	1.206	0.000307

[a] Turbine emission rates are based on the following assumptions:

- The maximum 1-hour NO_x and CO emission rate estimates based on the worst-case startup emissions.
- 1-, 3-, and 24-hour SO_2 emission rate estimates based on the worst-case fuel sulfur content of 0.66 grains/100 standard cubic feet of natural gas.
- 8-hour CO emission rate estimate based on three startups, three shutdowns, and the balance of steady state operation for each turbine.
- 24-hour $PM_{10}/PM_{2.5}$ emission rate estimates based on the worst-case 1-hour emission rate.

[b] Fire pump engine emissions are based on a 30-minute testing and maintenance time, restricted to between the hours of 8:00 and 11:00 a.m. on testing days.

Health Risk Assessment

The health risk assessment followed the same methodology as presented in the AFC. The AERMOD dispersion model was used in conjunction with the HARP program (Version 1.4d) to

[3] Emission rates for the turbines have been updated to reflect those modeled in Data Response 13 (i.e., the cumulative impact assessment). Fire pump engine emissions have been updated to reflect a 30-minute testing time, an annual operating scenario of 50 hours per year, and a restriction for testing between 8:00 and 11:00 a.m.

determine the incremental cancer risk and the chronic and acute health indices. The HARP onramp program was used to convert the AERMOD dispersion modeling files to a format compatible with the HARP program. Fire pump engine emissions have been updated to reflect a 30-minute testing time, an annual operating scenario of 50 hours per year, and a restriction for testing between 8:00 and 11:00 a.m.

Criteria Pollutant and Health Risk Analysis Modeling Results

Operational Air Quality Impacts Analysis

The highest modeled concentrations from the turbine scenarios and fire pump testing and maintenance activities were used to demonstrate compliance with the ambient air quality standards (AAQS). Table 2 presents a comparison of the maximum operational impacts associated with the revised general arrangement to the AAQS. In addition to a comparison with the federal 1-hour NO_2 standard, the results are also compared with the new federal 1-hour SO_2 standard of 75 parts per billion (ppb) (196 µg/m³), which was implemented in August 2010. This standard is based on the 3-year average of the 99th percentile of the yearly distribution of 1-hour daily maximum concentrations. However, as SO_2 impacts were not expected to exceed the standard, the maximum 1-hour impact was conservatively used to show compliance with this standard.

The operational NO_2, SO_2, and CO impacts, when added to the background concentrations, remain less than the AAQS. Therefore, MEP would not cause or contribute to the violation of a standard, and the NO_2, SO_2, and CO impacts from operation would remain less than significant for the revised general arrangement.

For PM_{10} and $PM_{2.5}$, background concentrations exceed the AAQS without the proposed project. Therefore, the predicted project impact with the revised general arrangement plus background would continue to exceed the AAQS (consistent with the similar finding in the Commission Decision). However, the project will provide adequate PM_{10} and $PM_{2.5}$ mitigation, so operation of MEP with the proposed general arrangement revision would not cause a significant PM_{10} and $PM_{2.5}$ impact. The dispersion modeling files are included as Attachment 3.

TABLE 2
MEP Operation Impacts Analysis—Maximum Modeled Impacts Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum Facility Impact (µg/m³)	Background (µg/m³) [a]	Total Predicted Impact (µg/m³)	State Standard (µg/m³)	Federal Standard (µg/m³)
NO_2	State 1-hour	150.0	105.7	256	339	-
	Federal 1-hour[b]	107.3	73.0	181	-	188
	annual	0.62	18.9	19.5	57	100
SO_2	State 1-hour	7.2	46.9	54.1	655	-
	Federal 1-hour[c]	7.2	46.9	54.1	-	196
	24-hour	1.1	18.3	19.4	105	365
	annual	0.007	5.2	5.2	-	80
CO	1-hour	138	5,029	5,167	23,000	40,000
	8-hour	23	2,640	2,663	10,000	10,000
PM_{10}	24-hour	2.95	126.8	129.7	50	150
	annual	0.054	24.8	24.9	20	-
$PM_{2.5}$	24-hour	2.95	81.2	84.1	-	35
	annual	0.054	14.3	14.4	12	15

TABLE 2
MEP Operation Impacts Analysis—Maximum Modeled Impacts Compared to the Ambient Air Quality Standards

[a] **Background concentrations** are the same as those presented in Air Quality Table 3 of the Commission Decision.

[b] The predicted air quality impact for comparison to the federal 1-hour NO_2 standard is based on the highest 8th high modeled NO_2 concentration. The highest 8th high modeled NO_2 concentration also includes the predicted impacts from th fire pump even though the EPA provided additional guidance on March 1, 2011, which states "the most appropriate data t use for compliance demonstrations for the 1-hour NO_2 NAAQS are those based on emissions scenarios that are continuou enough or frequent enough to contribute significantly to the annual distribution of daily maximum 1-hour concentrations.[4] Because the fire pump is expected to operate less than 50 hours per year for maintenance and testing, the fire pump is not expected to contribute significantly to the annual distribution of daily maximum 1-hour concentrations.

[c] The predicted air quality impact for comparison to the federal 1-hour SO_2 standard is conservatively based on the maximum predicted 1-hour concentration.

Note:
$\mu g/m^3$ = microgram(s) per cubic meter

Health Risk Analysis

The potential health impacts at the maximum exposed individual resident (MEIR), the maximum exposed individual worker (MEIW), and sensitive receptors associated with the operation of the MEP with the revised general arrangement are summarized in Table 3. The predicted incremental increase in cancer risk at the MEIR, MEIW, and the maximum exposed sensitive receptor are all well below the facility significance threshold of 10.0 in 1 million. Therefore, based on Bay Area Air Quality Management District (BAAQMD) Regulation 2, Rule 5, the predicted facility-wide incremental increase in cancer risk would remain less than significant.

The predicted chronic and acute indices are also well below the BAAQMD facility-wide significance threshold of 1.0. Therefore, the predicted impact from the proposed project and revised general arrangement will be less than significant.

The HARP modeling files are included as Attachment 3.

TABLE 3
Summary of MEP Health Risk Analysis Results: All Sources

Risk	Receptor Number	Predicted Result	Universal Transverse Mercator (NAD 27)
70-year Derived Adjusted Cancer Risk at the MEIR	714	0.0639 per million	(624300, 4183600)
70-year Derived Adjusted Cancer Risk Sensitive Receptor	857	0.0176 per million	(625338.14, 4182969.67)
40-year Cancer Risk at the MEIW	972	0.0239 per million	(623300, 4183400)
Maximum Resident Chronic HI	714	0.00082	(624300, 4183600)
Maximum Worker Chronic HI	972	0.00016	(623300, 4183400)
Maximum Chronic HI at Sensitive Receptor	857	0.00035	(625338.14, 4182969.67)

[4] *Additional Clarification Regarding Application of the Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard.* USEPA, Research Triangle Park. March 2011.

TABLE 3
Summary of MEP Health Risk Analysis Results: All Sources

Risk	Receptor Number	Predicted Result	Universal Transverse Mercator (NAD 27)
Maximum Resident Acute HI	2024	0.0318	(622500, 4178500)
Maximum Worker Acute HI	972	0.0536	(623300, 4183400)
Maximum Acute HI Sensitive Receptor	857	0.00695	(625338.14, 4182969.67)

Note:
HI = Hazard Index

Pursuant to Section 1769(a)(1)(F), a discussion of the impact of the modification on the facility's ability to comply with applicable laws, ordinances, regulations, and standards is required.

The project will comply with all applicable LORS. Some of these changes, such as the slight change in location of the tanks, are necessary to ensure that the project complies with spacing requirements in the applicable codes.

Pursuant to Section 1769(a)(1)(G), a discussion of how the modifications affect the public is required.

These minor changes to the General Arrangement do not result in significant physical changes to the environment inside or outside the fenceline of the project and do not negatively impact air quality or public health. There are no significant adverse effects on property owners that will result from the adoption of the changes proposed.

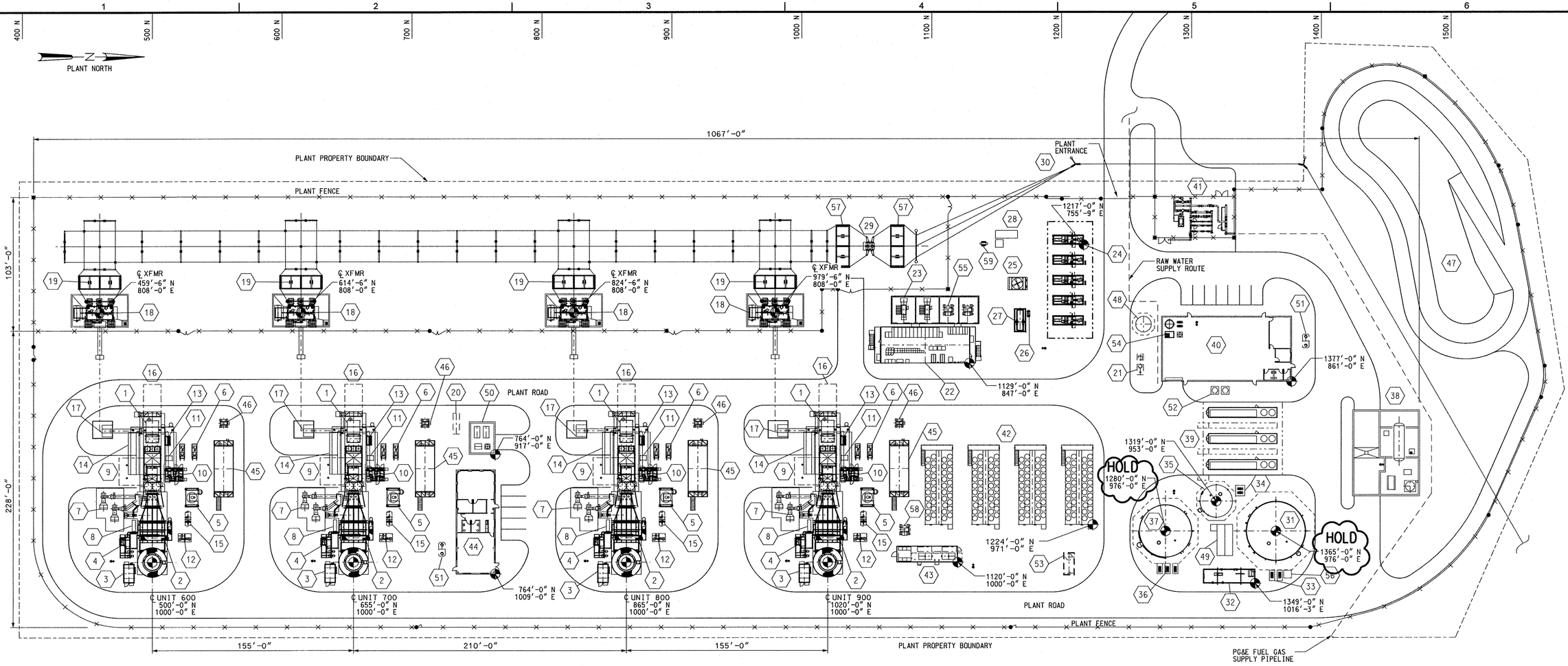
Pursuant to Section 1769(a)(1)(H), a list of property owners potentially affected by the modification is required.

The proposed minor changes in the General Plant Arrangement will have no significant environmental effects and will be in compliance with applicable LORS. Therefore, no property owners will be affected by the modifications.

Pursuant to Section 1769(a)(1)(I), a discussion of the potential effect on nearby property owners, the public and the parties in the application proceedings is required.

The proposed minor changes in General Plant Arrangement will have no significant environmental effects and will be in compliance with applicable LORS. Therefore, the proposed changes will have no impact on property owners, the public, or any other parties.

Attachment 1
Proposed General Arrangement Drawing for MEP (09-AFC-3C)



#	EQUIP. TAGS	DESCRIPTION
1.	CTG-CTG-6/7/8/9-01	GE LM-6000PC SPRINT COMBUSTION TURBINE GENERATOR
2.	SCR-CTG-6/7/8/9-01	HOT SCR (ECM)
3.	PK-CEM-6/7/8/9-01	CONTINUOUS EMISSIONS MONITORING SYSTEM
4.	SK-AMM-6/7/8/9-01	AMMONIA VAPORIZATION SKID
5.	CLR-CTG-6/7/8/9-01	CTG LUBE OIL COOLER
6.	SK-CTG-6/7/8/9-02 A/B	CTG DM WATER INJECTION PUMP SKIDS
7.	FAN-TA-6/7/8/9-01 A/B	TEMPERING AIR FANS
8.	MCC-ELV-06/07/08/09-01	MOTOR CONTROL CENTER
9.	TURBINE REMOVAL AREA	
10.	SK-CTG-6/7/8/9-01	CTG AUXILIARY SKID
11.	SK-CTG-6/7/8/9-03	CTG SPRINT SKID
12.	SK-CTG-6/7/8/9-04	CTG FUEL GAS FINAL FILTER SKID
13.	SK-CTG-6/7/8/9-05	CTG FIRE PROTECTION SKID (CO2 BOTTLES)
14.	CTG INLET AIR FILTER	CTG INLET AIR FILTER
15.	TK-CTG-6/7/8/9-01	CTG WATER WASH DRAIN TANK
16.	GENERATOR REMOVAL AREA	
17.	SG-EMV-6/7/8/9-01	15 KV BREAKER - UNITS 6 THRU 9
18.	GSU-6/7/8/9	GENERATOR STEP-UP TRANSFORMER (GSU)
19.	DS003.004.005.006	230 KV DISCONNECT SWITCH

#	EQUIP. TAGS	DESCRIPTION
20.	S-OW-0-01	OILY WATER SUMP
21.	OWS-DOW-0-01	OILY WATER SEPARATOR
22.	POWER DISTRIBUTION CENTER (PDC)	
23.	AUX-EMV-0-01	AUX TRANSFORMERS
24.	SK-FG-0-01/A/B/C/D/E	FUEL GAS COMPRESSOR SKIDS
25.	FFC-FG-0-01	FUEL GAS FIN-FAN RECYCLE COOLER
26.	TK-FG-0-01	FUEL GAS DRAINS TANK
27.	SK-FG-0-02	FUEL GAS DISCHARGE COALESCING FILTER SKID
28.	HTR-FG-0-02	FUEL GAS DEW POINT HEATER
29.	CB230-01	230 KV CIRCUIT BREAKER
30.	OVERHEAD 230 KV TRANSMISSION LINES	
31.	TK-SW-0-01	SERVICE/FIRE WATER STORAGE TANK (45' DIA.)
32.	SK-FP-0-01	FIRE WATER PUMP SKID
33.	P-SW-0-01 A/B	SERVICE WATER PUMPS
34.	P-WW-0-02 A/B	PROCESS WASTE WATER FORWARDING PUMPS
35.	TK-WW-0-01	WASTE WATER STORAGE TANK (25' DIA.)
36.	P-DW-0-01 A/B/C	DEMIN WATER PUMPS
37.	TK-DW-0-01	DEMIN WATER STORAGE TANK (40' DIA.)
38.	VS-AMM-0-01	AQUEOUS AMMONIA STORAGE TANK

#	EQUIP. TAGS	DESCRIPTION
39.	DEMIN WATER TRAILERS (PORTABLE)	
40.	WAREHOUSE & MAINT. BUILDING	
41.	SK-FG-0-03	FUEL GAS LETDOWN STATION
42.	SK-CHW-0-01/02/03/04	CHILLER PACKAGE
43.	HTR-CHW-0-01	ANTI-ICING HEATER
44.	CONTROL/ADMIN. BUILDING	
45.	CTG POWER CONTROL MODULE	
46.	XR-CTG-6/7/8/9-01	PCM TRANSFORMER
47.	DETENTION POND	
48.	TK-PW-0-01	7500 GAL. UNTREATED POTABLE WATER STORAGE TANK
49.	SK-DW-0-01	MULTIMEDIA FILTER SKID
50.	COMPRESSED AIR SYSTEM SHED	
51.	TK-SWW-0-01/02	SANITARY WASTE HOLDING TANKS (PUMP OUT)
52.	CHEMICAL STORAGE TOTE	
53.	S-WW-0-01	PROCESS WASTE WATER SUMP
54.	SK-PW-0-01	POTABLE WATER SKID
55.	SST-ELV-0-01	STATION SERVICE TRANSFORMERS
56.	SK-CF-0-01	SODIUM HYPOCHLORITE SKID
57.	DS001, DS002	230 KV PRIMARY DISCONNECT SWITCHES
58.	XR-CHW-0-01	ANTI-ICING SYSTEM TRANSFORMER
59.	XR-FG-0-01	FUEL GAS HEATER TRANSFORMER

NOTES:

1. ALL COORDINATES SHOWN ARE PLANT GRID COORDINATES UNLESS NOTED OTHERWISE. SEE CIVIL DRAWING NUMBERS: C-N0001 & C-S0001 FOR ADDITIONAL INFORMATION.

GE DATUM (B.O.S. LM6000) 0'-0" = EL. 126'-0"
GRADE EL. 125'-6"

40 0 40 80
Scale: 1 INCH = 40 FEET

RESPONSIBLE ENGINEER

PE #

NO.	DATE	REVISION	BY	CHK
A	03/24/11	ISSUED FOR REVIEW	EFC	SR
B	04/15/11	ISSUED FOR REVIEW	EFC	TBJ
0	06/01/11	ISSUED FOR CONSTRUCTION	EFC	TBJ

REVISION APPROVAL		REV 0	DATE 06/01/11
DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED
CIVIL	JP	ELECTRICAL	KM
STRUCTURAL	MI	INST & CONT.	MS
MECHANICAL	AJ	ARCH.	LB
PROCESS	AJ	GEN. ARRANG.	EC
PIPING	YS		

STATUS	REV	DATE	DM	SDE	PEM
PRELIMINARY	P1	01/14/11			
FOR REVIEW AND APPROVAL	B	04/15/11	RP	RP	JN
APPROVED FOR CONSTRUCTION	0	6/2/11	RP	RP	JN
REVISED & APPROVED FOR CONSTRUCTION					

SCALE 1" = 40'

Diamond Generating Corporation
A Subsidiary of Mitsubishi Corporation

Mariposa Energy Project

PROJECT NO. 415059

CH2MHILL
CH2MHILL Engineers, Inc.

GENERAL ARRANGEMENT

EQUIPMENT LOCATION PLAN

DWG. NO. G-PE001

REV. 0

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

FILENAME: mepgpe001.dgn PLOT DATE:

Attachment 2
Turbine and Fire Pump Emission Spreadsheets

Mariposa Energy Project
Table 5.1B.7R
Summary of Emergency Fire Pump Emissions - Criteria, HAPS, and Greenhouse Gas Pollutants
Revised October 2010 (Operating Hours Revised Per Discussion with BAAQMD/PDOC)

Assume: Cummins Model CFP7E-F40 (or equivalent) fire pump to be driven by 220 bhp diesel engine, Tier 3 engine
Engine operates a maximum of 0.5 hours per day / 50 hours per year for maintenance and reliability testing.

Rated Horsepower	220	Maximum rated capacity of the Cummins Model CFP7E-F40
Maximum Test Time:	0.5	(30 minutes per hour)
Tests/Day	1	
Hours/Year	50	
Max Fuel usage is	11.4 Gal/hr	(at 220 bhp, 1,760 RPM)
	5.70 Gal/day	(assumes a maximum of 30 minutes per hour)
	570 Gal/yr	

Engine Data Source - Cummins California ATCM Tier 3 Emissions Data Spec Sheet (15 ppm sulfur diesel fuel) - December 22, 2008

Pollutant	Emission Factor[1] Grams/Brake-Horsepower-Hour	Emissions lb/hr	lb/day	lb/yr	Annual lb/hr (used for modeling)
Hydrocarbons	0.062	0.0150	0.0150	1.50	0.000172
Oxides of Nitrogen	2.544	0.62	0.62	61.7	0.00704
Carbon Monoxide	1.193	0.29	0.29	28.9	0.00330
Particulates	0.111	0.027	0.027	2.69	0.000307
Sulfur Dioxide[2]	-	0.00121	0.00121	0.1206	0.0000138
	kg/gal	**lb/hr**	**lb/day**	**metric tons/yr**	
Carbon Dioxide[3]	10.15	128	128	5.79	
Methane[4]	0.0003	0.0038	0.0038	0.000171	
Nitrous Oxide[4]	0.0001	0.00126	0.00126	0.0000570	

1. Emission factors from the Cummins California ATCM Tier 3 Emissions Data Spec Sheet (15 ppm sulfur diesel fuel) - December 22, 2008.
2. Calculated from maximum fuel use of 11.4 gal/hr, fuel density of 7.05 lb/gal and 15 ppmw of sulfur.
3. Based on CCAR General Reporting Protocol (version 3.0, April 2008) Table C.6 emission factor for distillate oil of 10.15 kg/gal.
4. Based on CCAR General Reporting Protocol (version 3.0, April 2008) Table C.7 emission factor for distillate oil of 0.0003 kg CH4 /gal and 0.0001 kg N2O/gal.

Maximum Fuel usage is	11.4 Gal/hr	0.0114	1000 Gal/hr
	5.70 Gal/day	0.005700	1000 Gal/day
	570 Gal/yr	0.57	1000 Gal/yr

Pollutant	Emission Factor lb/1000 gallons	Emissions lb/hr	lb/day	lb/yr
Benzene	0.1863	0.00106	0.00106	0.1062
Formaldehyde	1.7261	0.0098	0.0098	0.984
Total PAHs (minus Naphthalene)	0.0362	0.00021	0.00021	0.0206
Naphthalene	0.0197	0.000112	0.000112	0.01123
Acetaldehyde	0.7833	0.0045	0.0045	0.446
Acrolein	0.0339	0.00019	0.00019	0.0193
1,3 Butadiene	0.2174	0.00124	0.00124	0.124
Chlorobenzene	0.0002	0.00000114	0.00000114	0.0001140
Dioxins	ND	ND	ND	ND
Furans	ND	ND	ND	ND
Propylene	0.467	0.0027	0.0027	0.266
Hexane	0.0269	0.00015	0.00015	0.0153
Toluene	0.1054	0.00060	0.00060	0.0601
Xylenes	0.0424	0.00024	0.00024	0.0242
Ethyl Benzene	0.0109	0.000062	0.000062	0.00621
Hydrogen Chloride	0.1863	0.00106	0.00106	0.1062
Arsenic	0.0016	0.0000091	0.0000091	0.000912
Beryllium	ND	ND	ND	ND
Cadmium	0.0015	0.0000086	0.0000086	0.000855
Hexavalent Chromium	0.0001	0.00000057	0.00000057	0.0000570
Copper	0.0041	0.000023	0.000023	0.00234
Lead	0.0083	0.000047	0.000047	0.00473
Manganese	0.0031	0.000018	0.000018	0.00177
Mercury	0.0020	0.000011	0.0000114	0.001140
Nickel	0.0039	0.000022	0.000022	0.00222
Selenium	0.0022	0.000013	0.0000125	0.00125
Zinc	0.0224	0.00013	0.000128	0.0128
			Total (lb/yr)	2.22

Emission Factor Source - Ventura County APCD AB-2588 Combustion Emission Factors, dated May 17, 2001

Mariposa Energy Project
Table 5.1B.4R
Turbine Criteria Pollutant Emission Estimates
March 2011

Daily Emissions based on Maximum daily operation of 24 hours/day
Annual Emissions based on Maximum annual operation of 4000 hours/year

Normal Operation Scenario(1)				Fuel Input[1,3]		Emissions[1,3] (Per Turbine)															
						NOx			CO			VOC			Particulates			SO_2[2]			
Ambient	GE	RH	Load	Per CT	Per CT	lb/hr	lb/day	lb/yr	lb/hr	lb/day	lb/yr	lb/hr	lb/day	lb/yr	lb/hr	lb/day	lb/yr	Max lb/hr	lb/day	Avg lb/hr	lb/yr
Temp F	Date	%	%	MMBtu/hr (HHV)	lb/hr																
17	1/29/2009	80	100	465	22,108	4.24	102	16,960	2.06	50	8,260	0.58	14	2,316	2.5	60	10,000	0.88	21.1	0.33	1,302
46	1/27/2009	95	100	481	22,891	4.40	105	17,580	2.14	51	8,574	0.60	14	2,383	2.5	60	10,000	0.91	21.8	0.34	1,348
59	1/27/2009	60	100	465	22,117	4.25	102	16,988	2.07	50	8,267	0.58	14	2,313	2.5	60	10,000	0.88	21.1	0.33	1,302
59	12/9/2008	60	50	282	12,364	2.60	62	10,400	1.22	29	4,895	0.39	9	1,560	2.5	60	10,000	0.53	12.8	0.20	790
93	1/27/2009	26	100	391	18,591	3.57	86	14,276	1.74	42	6,973	0.49	12	1,948	2.5	60	10,000	0.74	17.7	0.27	1,095
93	12/9/2008	26	50	270	11,842	2.40	58	9,600	1.17	28	4,662	0.36	9	1,420	2.5	60	10,000	0.51	12.3	0.19	757
112	1/29/2009	15	100	338	16,092	3.09	74	12,348	1.51	36	6,021	0.42	10	1,687	2.5	60	10,000	0.64	15.3	0.24	947

50% load

(1) Source: GE Gas Turbine Performance Sheets for 17, 46, 59, 93 and 112F.
Data for 17 and 112F (Base Load) are based on January 29, 2009 data.
Data for 46, 59, and 93F (Base Load) are based on January 27, 2009 data.
Data for 59 and 93F (50% Load) are based on December 9, 2008 data
(2) Maximum SO2 Emissions based on a emission factor of 0.00189 lb SO2 per MMbtu natural gas - Source: 0.66 gr sulfur/100 cf natural gas, using method in AP-42 ch.1 table 1.4-2 and natural gas heat value of 1047 btu/scf.
(3) Per CTG, assuming BACT levels of 2.5 ppm NOx, 2 ppm CO, and 1 ppm VOC. Daily emissions represent 24 hours per day per CTG. Annual emissions represent 4000 hours per CTG per year.

Modeling Scenarios

Normal Operation Scenario(1)				Exhaust Stack Conditions						Maximum Exhaust Emissions Rates (pound per hour)(per turbine)											
				Stack Temp	Flow		Stack Height	Stack Diameter	Velocity	NOx		CO		SOx				PM10		PM2.5	
Ambient	GE	RH	Load	F	lb/hr	ACFM[a]	Feet	Feet	ft/s	1-Hour[b]	Annual[c]	1-Hour[b]	8-Hour[d]	1-Hour[b]	3-Hour[e]	24-Hour[f]	Annual[c]	24-Hour[f]	Annual[c]	24-Hour[f]	Annual[c]
Temp F	Date	%	%																		
17	1/29/2009	80	100	780	1127562	607693	79.5	12.0	89.6	18.506	2.493	17.319	7.968	0.910	0.910	0.910	0.1625	2.50	1.206	2.50	1.206
46	1/27/2009	95	100	840	1083789	612224	79.5	12.0	90.2	18.506	2.493	17.319	7.968	0.910	0.910	0.910	0.1625	2.50	1.206	2.50	1.206
59	1/27/2009	60	100	848	1051375	597341	79.5	12.0	88.0	18.506	2.493	17.319	7.968	0.910	0.910	0.910	0.1625	2.50	1.206	2.50	1.206
59	12/9/2008	60	50	743	842305	440226	79.5	12.0	64.9	18.506	2.493	17.319	7.968	0.910	0.910	0.910	0.1625	2.50	1.206	2.50	1.206
93	1/27/2009	26	100	861	930219	533924	79.5	12.0	78.7	18.506	2.493	17.319	7.968	0.910	0.910	0.910	0.1625	2.50	1.206	2.50	1.206
93	12/9/2008	26	50	781	787723	424813	79.5	12.0	62.6	18.506	2.493	17.319	7.968	0.910	0.910	0.910	0.1625	2.50	1.206	2.50	1.206
112	1/29/2009	15	100	863	845007	485749	79.5	12.0	71.6	18.506	2.493	17.319	7.968	0.910	0.910	0.910	0.1625	2.50	1.206	2.50	1.206

50% load

[a] Assumes exhaust gases have an average molecular weight of 28.0 lb/lbmol, pressure of 1 atm, and gas constant equal to 0.7302 atm ft^3/(lbmol R).
[b] Maximum 1-hr scenario assumes one startup lasting 30 minutes, 15 minutes of steady state operation, and one shutdown lasting 15 minutes.
[c] Annual emission rate for NOx, SOx, PM10, and PM2.5 were conservatively based on 4,000 hours of turbine operation at full capacity with air inlet chiller operating, plus 300 startup and shutdown events. The annual SO2 emission rate is based on
[d] 8-Hour Scenario assumes 3 startups, 3 shutdowns, and the balance of steady-state
[e] 3-Hour Scenario assumes 3 hours of steady-state operation
[f] 24-hour PM10/PM2.5 emission rate estimate based on the worst-case 1-hour emission rate (full capacity with air inlet chiller operating).

Attachment 3
AERMOD and HARP Modeling Files (CD-ROM)

Additional copies of the AERMOD and HARP modeling files are available upon request.