AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

Air Pollution Control Board

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June 20, 2008

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EILEEN ALLEN
PROJECT MANAGER
CALIFORNIA ENERGY COMMISSION
1516 NINTH ST
SACRAMENTO CA 95814-5512

Final Determination of Compliance
Chula Vista Energy Upgrade Project

Enclosed is the San Diego County Air Pollution Control District (District) Final Determination of Compliance (FDOC) for the Chula Vista Upgrade Project (No. 07-AFC-4) proposed by MMC Chula Vista, LLC. The FDOC includes the District's evaluation of the project's compliance with applicable District rules and regulations.

The District has determined that the project as proposed will comply with all applicable District rules and regulations if it is constructed and operated in accordance with the information submitted in conjunction with the application(s) for District Authority to Construct, the application for certification submitted to the CEC, and the terms and conditions of the FDOC.

If you have any questions concerning the above or the enclosed FDOC, please contact the undersigned at (858) 586-2741 or John Annicchiarico, Senior Air Pollution Control Engineer, at (858) 586-2733.

Sincerely,

Arthur Carbonell
Associate Air Pollution Control Engineer

MMC CHULA VISTA UPGRADE PROJECT

FINAL DETERMINATION OF COMPLIANCE

SAN DIEGO AIR POLLUTION CONTROL DISTRICT
Application Numbers 985092 and 985093

June 19, 2008

Arthur Carbonell
John Annicchiarico

Project Engineer:	Arthur Carbonell
Senior Engineer:	John Annicchiarico
Application Number:	985092-93
Site ID Number:	7084A
Fee Schedule:	20F
BEC:	new

I. APPLICATION INFORMATION

Owner / Operator:	MMC Chula Vista
Mailing Address:	3497 Main St. Chula Vista CA 91911
Equipment Address:	3497 Main St. Chula Vista, CA 91911
Contact:	Mark Wellard
Position:	Operator
Phone Number:	(619) 420-3291

II. EQUIPMENT DESCRIPTION

985092

Gas Turbine Engine Generator #1: General Electric, Model LM-6000, 46.5 MW capacity, 468.8 MMBtu/hr heat input, natural gas fired, simple cycle, S/N TBD, with water injection; a selective catalytic reduction (SCR) system including an automatic ammonia injection control system; an oxidation catalyst; a Continuous Emission Monitoring System (CEMS) for NOx, CO and O_2; and a data acquisition and recording system (DAS).

985093

Gas Turbine Engine Generator #2: General Electric, Model LM-6000, 46.5 MW capacity, 468.8 MMBtu/hr heat input, natural gas fired, simple cycle, S/N TBD, with water injection; a selective catalytic reduction (SCR) system including an automatic ammonia injection control system; an oxidation catalyst; a Continuous Emission Monitoring System (CEMS) for NOx, CO and O_2; and a data acquisition and recording system (DAS).

III. PROJECT DESCRIPTION

MMC Chula Vista (applicant) has applied for an Authority to Construct and Permit to Operate two additional gas turbines, each rated at 46.5 MW, to provide power during peak hours as determined by the Public Utilities Commission (PUC). The site has two existing peaker turbines, each rated at 44 MW, permitted under Permit to Operate Nos. 976038 and 976039. The emissions from the new turbines will be controlled through the use of water injection, a Selective Catalytic Reduction (SCR) system and an oxidation catalyst.

Since the increase in power is between 50 MW and100 MW, this project qualifies for a small power plant exemption from the California Energy Commission (CEC). However, the applicant has opted to apply for an Application for Certification (AFC) through the CEC in order to address all permitting concerns through a single agency. The San Diego Air Pollution Control District (District) is considered to be a responsible agency for this certification and is responsible to submit a Preliminary Determination of Compliance (PDOC) and a Final Determination of Compliance (FDOC) to the CEC. The process of evaluating this equipment for the PDOC and FDOC will be functionally equivalent to the District's Authority to Construct review process pursuant to District Rule 20.5. The PDOC was submitted to the CEC on March 6, 2008. Comments on the PDOC and District responses to those comments are contained in Attachment C.

MMC Chula Vista will limit operation of these turbines to a maximum of 4400 hours per calendar year with the assumption of 4000 hours under normal operating conditions (i.e., base load), 200 hours under cold start conditions, and 200 hours under warm start conditions. The estimated emissions under normal operating conditions are listed in Table 1. These values are based on the equipment complying with Best Available Control Technology (BACT) guidelines. Note that the turbines also utilize fogging technology to increase efficiency, which will slightly increase VOC emissions. However, at no time will the VOC BACT limit be exceeded.

Since the turbines are operated on an "as needed" basis, during the course of the year, the turbines will experience multiple startups and shutdowns. MMC Chula Vista estimates a maximum of 200 hours of cold startup time and 200 hours of hot startup time per year. Note that this implies a total shutdown time of 400 hours per year. The expected emissions when operating under startup and shutdown conditions are listed in Table 2. The maximum duration of each startup will be half an hour and the maximum duration of each shutdown will be 10 minutes. The hourly emission rates listed in Table 2 reflect a full hour of operation under each condition (e.g. each startup emission rate consists of half an hour under startup mode and half an hour under normal operation). For this equipment, BACT is considered to be 2.5 ppm for oxides of nitrogen (NOx) corrected to 15% oxygen and averaged over a 1-hour period, 6.0 ppm for carbon monoxide (CO) corrected to 15% oxygen and averaged over a 3-hour period, and 2.0 ppm for volatile organic compounds (VOC) corrected to 15% oxygen and averaged over a 1-hour period.

All criteria pollutant emission estimates were calculated based on values proposed by the applicant and which conform to BACT standards. Toxic air contaminant emission estimates were calculated using District default emission factors which are based on EPA AP-42 factors for gas turbines.

This project requires an Air Quality Impact Analysis (AQIA) to satisfy New Source Review (NSR) requirements. Additionally, a Health Risk Assessment (HRA) is required to evaluate the emissions of toxic air contaminants. Ralph DeSiena of the District Meteorology Group has reviewed and approved the air dispersion modeling supporting the AQIA and HRA, and Dick Brightman of the District Toxics Group has reviewed and approved the HRA.

The applicant had initially proposed the added installation of a diesel-fired emergency engine. This proposed engine has since been removed from this project.

IV. EMISSION ESTIMATES

Criteria Pollutants:

The following Table 1 is based on information supplied by the applicant and/or required by BACT:

Table 1 - Maximum Emissions per Turbine Operating Under Normal Conditions		
Pollutant	**Concentration, ppmvd @ 15% O2**	**Emission Rate, lbs/hr**
NOx	2.5 (1-hr avg.)	4.4
CO	6.0 (3-hr avg.)	6.4
VOC	2.0 (1-hr avg.)	1.2
PM_{10}		3.0
SOx		1.1

Hourly mass emission rates for NOx, CO, and VOC under normal operating conditions were calculated as follows:

emissions = (concentration, ppm)*(exhaust flow rate, cfh)*(molecular weight/molar volume)
where exhaust flow rate was calculated using EPA Method 19

Hourly mass emission rates for PM_{10} and SOx were supplied by the applicant and based on vendor data.

The following assumptions were made to estimate maximum emissions:

total operating time =4400 hrs/yr
total operating time under cold startup conditions = 200 hrs/yr
total operating time under warm startup conditions = 200 hrs/yr
PM_{10} and SOx emissions are unchanged during startups and shutdowns
maximum of one cold start and one shutdown per day

Therefore, the worst case emissions will be the following:

daily emissions = (base load emissions, lbs/hr)*(22 hrs/day) + (cold start, lbs/hr)*(1 hr/day)
+ (shutdown, lbs/hr)*(1 hr/day)

annual emissions = (base load emissions, lbs/hr)*(4000 hrs/yr) + (cold start, lbs/hr)*(200 hrs/yr)
+ (warm start, lbs/hr)*(200 hrs/yr)

The following Table 2 is based on information supplied by the applicant:

Table 2 - Maximum Emissions per Turbine During Startup and Shutdown Conditions				
Condition	**Emissions, lbs/hr**			**Duration, hrs**
	NOx	**CO**	**VOC**	
Cold Start	19.3	14.3	1.4	0.5
Hot Start	8.8	9.2	1.4	0.5
Warm Start	12.2	10.8	1.4	0.5
Shutdown	7.8	8.9	1.4	0.17 (10 min.)

See attached spreadsheet for full emission calculations.

The following Tables 3a and 3b are a summary of the criteria pollutant emissions calculations:

Table 3a - Maximum Emissions from Each Turbine			
Pollutant	**lbs/hr**	**lbs/day**	**tons/yr**
NOx	4.4	124.1	12.0
CO	6.4	164.8	15.4
VOC	1.2	29.8	2.7
PM_{10}	3.0	72.0	6.6
SOx	1.1	26.4	2.4

Table 3b - Maximum Emissions from Both Turbines			
Pollutant	**lbs/hr**	**lbs/day**	**tons/yr**
NOx	8.8	248.1	23.9
CO	12.9	329.7	30.8
VOC	2.5	59.0	5.5
PM_{10}	6.0	144.0	13.2
SOx	2.2	52.8	4.8

V. RULES ANALYSIS

Rule 20.1 and 20.2 - New Source Review (Non-Major Stationary Sources):

Rule 20.2(d)(1) - Best Available Control Technology/Lowest Achievable Emission Rate:

This subsection of the rule requires that Best Available Control Technology (BACT) be installed on a pollutant specific basis if emissions exceed 10 lbs/day for each criteria pollutant (except for CO for which the PSD BACT threshold is 100 tons/yr). Based on emission calculations BACT is triggered for NOx, VOC, SOx, and PM10.

NOx: According to the ARB Guidance for Power Plant Siting and Best Available Control Technology, September 1999 (see www.arb.ca.gov/powerpl/guidocfi.pdf), BACT for this equipment is 2.5 ppm based on a 1-hour averaging period calculated at 15% oxygen. This level of emissions has also been applied so similar peaking turbines licensed in California. No lower BACT limits were found for this type of equipment. This equipment is expected to comply with this limit using water injection and an SCR system. Initial and annual source testing, as well as the installation of CEMS, will be used to confirm compliance with this limit.

CO: According to the ARB Guidance for Power Plant Siting and Best Available Control Technology, September 1999, BACT for CO emissions from this equipment is 6.0 ppm based on a 3-hr averaging period, calculated at 15% oxygen. No lower limits were found by searching RACT/BACT/LAER Clearinghouses. Therefore, the ARB Guidance was accepted as BACT. This equipment is expected to comply with this limit using an SCR system with an oxidation catalyst. Initial and annual source testing, as well as the installation of CEMS, will be used to confirm compliance with this limit.

VOC: From the ARB Guidance for Power Plant Siting and Best Available Control Technology, September 1999, and from searching BACT Clearinghouses, BACT for this equipment is 2.0 ppm @ based on a 1-hour averaging period calculated at 15% oxygen No lower BACT limits were found for this type of equipment. This equipment is expected to comply with this limit using an SCR system with an oxidation catalyst. Initial and annual source testing will be used to confirm compliance with this limit.

PM_{10}: From the ARB Guidance for Power Plant Siting and Best Available Control Technology, September 1999, BACT for this equipment is stated to be the use of natural gas which contains less than 1 grain of sulfur compounds per 100 standard cubic feet of natural gas. However, by searching RACT/BACT/LAER Clearinghouses and other air agencies' determinations, BACT for this equipment was determined to be the use of natural gas which contains less than 0.25 grains of sulfur compounds per 100 standard cubic feet of natural gas. The Public Utility Commission (PUC)-quality natural gas sold in San Diego County is expected to comply with this limit. The applicant will be required to maintain documents showing the sulfur content of the natural gas used.

SOx: From the ARB Guidance for Power Plant Siting and Best Available Control Technology, September 1999, BACT for this equipment is stated to be the use of natural gas which contains less than 1 grain of sulfur compounds per 100 cubic feet of natural gas (0.55 ppmvd @ 15% O2). However, by searching RACT/BACT/LAER Clearinghouses and other air agencies' determinations, BACT for this equipment was determined to be the use of natural gas which contains less than 0.25 grains of sulfur compounds per 100 standard cubic feet of natural gas. The Public Utility Commission (PUC)-quality natural gas sold in San Diego County is expected to comply with this limit. The applicant will be required to maintain documents showing the sulfur content of the natural gas used.

Rule 20.2(d)(2) - Air Quality Impact Analysis (AQIA):

This part of the rule requires the applicant to conduct an Ambient Air Quality Impact Analysis of the unit's emissions if the emission threshold values are equaled or exceeded for NOx, CO, SOx, or PM_{10}. The threshold values for NOx and SOx are 25 lbs/hr, 250 lbs/day or 40 tons/yr. The threshold values for CO are 100 lbs/hr, 550 lbs/day or 100 tons/yr. The threshold values for PM_{10} are 100 lbs/day or 15 tons/yr. An AQIA is triggered for NOx, CO, and PM10.

An AQIA was performed for NOx, CO, $PM_{10}/PM_{2.5}$, and SOx by the applicant. This analysis was reviewed by the District's Monitoring and Technical Services Group. The AQIA was re-done to reflect more recent meteorological data and modeling programs, the deletion of the emergency engine, the revised particulate matter emissions, and revised hours of operation. This analysis was again reviewed by the District's Monitoring and Technical Services Group and determined to be acceptable.

A 30-day public notice and comment period was initiated at the time of the submittal of the PDOC to the CEC beginning on March 10, 2008, and ending April 9, 2008. All comments received were considered and a response to each was prepared. A document summarizing comments and responses is included with this FDOC as Attachment C.

Rule 20.2(d)(5) - Emission Offsets:

This part of the rule requires that emission reduction credits be provided if the emission threshold values are equaled or exceeded for NOx, VOC, SOx, or PM_{10}. The threshold value for NOx and VOC is 50 tons/yr. The threshold value for SOx and PM_{10} is 100 tons/yr. Based on emission calculations, emission offsets are not required for this project.

Rule 20.5 - Power Plants:

This rule requires that the District submit Preliminary and Final Determination of Compliance reports to the California Energy Commission (CEC) which shall be equivalent to an evaluation for a District Authority to Construct.

This document comprises the Final Determination of Compliance (FDOC).

Rule 50 - Visible Emissions:

This rule limits air contaminant emissions into the atmosphere of shade darker than Ringlemann Number 1 (20% opacity) for more than an aggregate of three minutes in any consecutive sixty minute time period.

Based on the equipment and the type of fuel used, no visible emissions at or above this level are expected.

Rule 51 - Nuisance:

This rule prohibits the discharge of air contaminants that cause or have a tendency to cause injury, nuisance, annoyance to people and/or the public or damage to any business or property.

No nuisance complaints are expected from this equipment.

Rule 53 - Specific Air Contaminants:

This rule limits emissions of sulfur compounds (calculated as SO_2) to less than or equal to 0.05%, by volume, on a dry basis. This rule also limits particulate matter emissions from gaseous fuel combustion to less than or equal to 0.1 grains per dry standard cubic foot of exhaust calculated at 12% CO2.

The use of Public Utilities Commission (PUC) quality natural gas sold in San Diego County is expected to comply with the sulfur emission requirements and is expected to have a sulfur fuel content less than 0.25 grains per standard cubic foot (gr/dscf).

Based on an estimated particulate matter emission rate of 3.0 lbs/hr, combustion particulates at maximum load are estimated to be 0.0056 gr/dscf @ 12% CO_2 (see attached calculations sheet).

Compliance with this rule is expected.

Rule 68 - Oxides of Nitrogen from Fuel Burning Equipment:

This rule limits NOx emissions from any fuel burning equipment to less than 125 ppmv calculated as NO_2 at 3% oxygen on a dry basis.

Since this equipment is subject to the requirements of Section (d) of Rule 69.3.1, the equipment is exempt from this rule.

Rule 69.3 - Stationary Gas Turbines - Reasonably Available Control Technology:

This rule limits NOx emissions from gas turbines greater than 0.3 MW to 42 ppm at 15% oxygen when fired on natural gas. The rule also specifies specific monitoring and record keeping requirements. Startups, shutdowns, and fuel changes are defined by the rule and excluded from compliance with these limits.

The facility permit will contain conditions to limit emissions below the emission levels specified in Rule 69.3.1 (excluding startups). Therefore, since those limits are more stringent than the 42 ppm limit, compliance with this rule is expected.

Rule 69.3.1 - Stationary Gas Turbines - Best Available Retrofit Control Technology:

This rule limits NOx emissions from gas turbines greater than 10 MW to 15x(E/25) ppm when operating uncontrolled and 9x(E/25) ppm at 15% oxygen when operating with controls and averaged over a 1-hour period. E is the thermal efficiency of the unit. The rule also specifies monitoring and record keeping requirements. Startups, shutdowns, and fuel changes are defined by the rule and excluded from compliance with these limits.

BACT sets emission limits of 2.0 ppm for NOx averaged over a 1-hour period and corrected to 15% oxygen. This limit is more stringent than the limit required by this rule. Therefore, compliance is expected. An initial and annual source testing, as well as CEMS data, will confirm compliance.

Emission excursions above these levels during the Commissioning Period are not authorized by this rule. However, the District has adopted a policy to allow up to 200 hours of operation during which the standards of this rule will not apply. This time frame will begin when fuel is first fired to the equipment and will end when the air pollution control equipment is installed and fully functional or operation has exceeded 200 hours, whichever is occurs sooner.

Rule 1200 - Toxic Air Contaminants, New Source Review:

This rule requires that a Health Risk Assessment (HRA) be performed if the emissions of toxic air contaminants will increase. A detailed HRA is necessary if toxic emissions exceed District de minimus levels. Toxics Best Available Control Technology (TBACT) must be installed if the HRA shows a cancer risk greater than one in a million. At no time shall the cancer risk exceed ten in a million.

An HRA showing the risks below rule 1200 standards was performed by the applicant. This analysis was reviewed by the Toxics Section and re-calculated using District default emission factors based on EPA AP-42 factors for gas turbines. The Toxics Section's report is attached. Note that this report included emissions from a proposed diesel emergency engine which has since been removed from the project.

40 CFR Part Subpart KKKK

This New Source Performance Standard (NSPS) applies to any stationary combustion turbine that commenced construction, modification or reconstruction after February 18, 2005. The District has not been delegated authority by the US Environmental Protection Agency (EPA) to enforce this regulation, however this equipment is expected to comply with the emission standards of this subpart.

VI. CONCLUSIONS AND RECOMMENDATIONS

A Determination of Compliance shall confer the same rights and privileges as an Authority to Construct only when and if the California Energy Commission (CEC) approves the Application for Certification, and the CEC certificate includes all conditions of the Determination of Compliance as proposed by the Air Pollution Control Officer.

If operated in accordance with the permit conditions specified in this Final Determination of Compliance and Authority to Construct, this equipment is expected to operate in compliance with all Rules and Regulations of the San Diego County Air Pollution Control District.

Project Engineer — Date: 6/20/08

Senior Engineer Approval — Date: 6/20/08

VII. PROPOSED PERMIT CONDITIONS

1. This equipment shall be properly maintained and kept in good operating condition at all times.

2. This equipment shall be fired on Public Utility Commission (PUC) quality natural gas only. The applicant shall maintain quarterly records of sulfur content (grains/100 dscf) and higher and lower heating values (Btu/dscf) of the natural gas and provide such records to District personnel upon request.

3. Permittee shall submit a complete Acid Rain permit application prior to commencement of operation in accordance with 40 CFR Part 72 to the District and submit a copy to EPA, Region IX.

4. For this equipment, the applicant shall hold allowances in accordance with 40 CFR 72.9(c)(1).

5. This equipment shall not be operated more than 4400 hours per calendar year.

6. Operation of this equipment under cold startup conditions shall not exceed 200 hours per calendar year.

7. Operation of this equipment under hot or warm startup conditions shall not exceed 200 hours per calendar year.

8. For the purposes of this Authority to Construct, the commissioning period shall be defined as the time beginning from first fuel firing and ending when the emission controls are installed and fully functional, and the owner or operator has provided the District with a Construction Completion Notice, whichever is sooner. The duration of this commissioning period shall not exceed 200 operating hours. A log of the dates, times and cumulative unit operating hours when fuel is being combusted during the commissioning period shall be maintained by the operator and made available to District personnel upon request. Prior to first fuel firing, the owner or operator shall submit a completed First Fuel Fire Notice Form to the District.

9. For the purposes of this Authority to Construct, startup conditions shall be defined as the time when fuel flow begins until the time that the unit complies with the emission limits specified in this Authority to Construct but in no case exceeding 30 minutes per occurrence. Shutdown conditions shall be defined as the time preceding the moment at which fuel flow ceases and during which the unit does not comply with the emission limits specified in this Authority to Construct but in no case exceeding 30 minutes per occurrence. The Data Acquisition and Recording System (DAS), as required by 40CFR75, shall record these events. This condition may be modified by the District based on field performance of the equipment.

10. During startup conditions, the emissions from this turbine shall not exceed the following emission limits as determined by the continuous emissions monitoring system (CEMS), continuous monitors and/or District-approved emissions testing. Compliance with each limit shall be based on a 1-hour averaging period.

Pollutant	Startup Emission Limit, lbs/hr
Oxides of Nitrogen, NOx (calculated as NO2)	19.3
Carbon Monoxide, CO	14.3
Volatile Organic Compounds, VOC	1.4

11. During shutdown conditions, the emissions from this turbine shall not exceed the following emission limits as determined by the continuous emissions monitoring system (CEMS), continuous monitors and/or District-approved emissions testing. Compliance with each limit shall be based on a 1-hour averaging period.

Pollutant	Shutdown Emission Limit, lbs/hr
Oxides of Nitrogen, NOx (calculated as NO2)	7.8
Carbon Monoxide, CO	8.9
Volatile Organic Compounds, VOC	1.4

12. Except during the commissioning period, startups and shutdowns, the water injection system, the SCR system and oxidation catalyst control system, including the automatic ammonia injection system serving the turbine, shall be in full operation at all times when the turbine is in operation.

13. In the event of a breakdown in an automatic ammonia injection control system, a trained operator shall operate the system manually and the breakdown shall be reported to the District Compliance Division pursuant to Rule 98(b)(1) and 98(e).

14. Total combined oxides of nitrogen emissions from the turbines described in Application Nos. 985092 and 985093 shall not exceed the major source threshold of 50 tons per calendar year. The daily NOx mass emissions from each turbine shall be recorded daily. The aggregate NOx mass emissions from all turbines for each calendar month, and for each rolling 12-month period, shall be calculated and recorded monthly. In the event that an annual major stationary source threshold is projected to be triggered, the applicant shall submit a complete application to modify this permit at least 6 months prior to the projected date of exceedance demonstrating how compliance with all applicable requirements will be achieved.

15. Emissions of oxides of nitrogen (NOx), calculated as nitrogen dioxide, from the turbine exhaust stack shall not exceed 2.5 parts per million volume on a dry basis (ppmvd) corrected to 15% oxygen and averaged over each 1-hour period. Compliance with this limit shall be demonstrated continuously based on CEMS data and based upon source testing calculated as the average of three subtests. This limit shall not apply during the commissioning period or during startup and shutdown conditions.

16. Total combined carbon monoxide (CO) emissions from the turbines described in Application Nos. 985092 and 985093 shall not exceed the Prevention of Significant Deterioration (PSD) threshold of 250 tons per calendar year. The daily CO mass emissions from each unit shall be recorded daily. The aggregate CO mass emissions from all turbines for each calendar month, and for each rolling 12-month period, shall be calculated and recorded monthly. In the event that an annual PSD stationary source threshold is projected to be triggered, the applicant shall submit a complete application to modify this permit at least 6 months prior to the projected date of exceedance demonstrating how compliance with all applicable requirements will be achieved.

17. Emissions of carbon monoxide (CO) from the turbine exhaust stack shall not exceed 6.0 parts per million volume on a dry basis (ppmvd) corrected to 15% oxygen and averaged over each 3-hour period. Compliance with this limit shall be demonstrated continuously based on CEMS data and based upon source testing calculated as the average of three subtests. This limit shall not apply during the commissioning period or during startup and shutdown conditions.

18. Total combined VOC emissions from the turbines described in Application Nos. 985092 and 985093 shall not exceed the major source threshold of 50 tons per calendar year. The daily VOC emissions from each unit shall be recorded daily. The aggregate VOC mass emissions from all turbines for each calendar month, and for each rolling 12-month period, shall be calculated and recorded monthly. All emission calculations shall be based on fuel usage and emission factors approved by the District. In the event that an annual major stationary source threshold is projected to be triggered, the applicant shall submit a complete application to modify this permit at least 6 months prior to the projected date of exceedance demonstrating how compliance with all applicable requirements will be achieved.

19. Emissions of volatile organic compounds (VOCs), calculated as methane, from the turbine exhaust stack shall not exceed 2.0 parts per million volume on a dry basis (ppmvd) corrected to 15% oxygen and averaged over each 1-hour period. Compliance with this limit shall be demonstrated continuously based on CEMS data and based upon source testing calculated as the average of three subtests. At the time of the initial compliance test, a District-approved CO/VOC surrogate relationship shall be established. The CO/VOC surrogate relationship shall be verified and/or modified, if necessary, based on annual source testing. This limit shall not apply during the commissioning period or during startup and shutdown conditions.

20. The emissions from this turbine shall not exceed the following emission limits, except during commissioning period, startup and shutdown conditions, as determined by the continuous emissions monitoring system (CEMS), continuous monitors and/or District-approved emissions testing, calculated as the average of three subtests. Compliance with each limit shall be based on a 1-hour averaging period.

Pollutant	Emission Limit, lbs/hr
Oxides of Nitrogen, NOx (calculated as NO2)	4.4
Carbon Monoxide, CO	6.4
Volatile Organic Compounds, VOC	1.2

21. The emissions from this turbine shall not exceed the following emission limits, except during the commissioning period, as determined by the continuous emissions monitoring system (CEMS), continuous monitors and/or District-approved emissions testing. Compliance with each limit shall be based on a calendar day averaging period.

Pollutant	Emission Limit, lbs/day
Oxides of Nitrogen, NOx (calculated as NO2)	124.1
Carbon Monoxide, CO	164.8
Volatile Organic Compounds, VOC	29.5

22. The emissions from this turbine shall not exceed the following emission limits, except during the commissioning period, as determined by the continuous emissions monitoring system (CEMS), continuous monitors and/or District-approved emissions testing. Compliance with each limit shall be based on a calendar year averaging period.

Pollutant	Emission Limit, tons/yr
Oxides of Nitrogen, NOx (calculated as NO2)	12.0
Carbon Monoxide, CO	15.4
Volatile Organic Compounds, VOC	2.7

23. Emissions of particulate matter less than 10 microns (PM10) shall not exceed 3.0 pounds per hour. Compliance with this limit shall be demonstrated based upon source testing calculated as the average of three subtests.

24. Ammonia emissions from the gas turbine shall not exceed 5 ppmvd corrected to 15% oxygen. Compliance with this limit shall be demonstrated based upon source testing calculated as the average of three subtests and utilizing one of the following procedures:
    a. calculate daily ammonia emissions using the following equation:
       NH3 = ((a-(b * c/1,000,000))* (1,000,000/b)) * d
       where: a = ammonia injection rate (lbs/hr) / (17.0 lbs/lb-mole),
       b = exhaust flow rate @ 15% oxygen / (29 lbs/lb-mole),
       c = change in measured NOx concentration (ppmvd @ 15% oxygen) across the catalyst,
       d = ratio of measured ammonia slip to calculated ammonia slip as derived during compliance testing;
    b. other calculation method using measured surrogate parameters to determine the daily ammonia emissions in ppmvd @ 15% oxygen, as approved by the District.

25. An operating log or Data Acquisition System (DAS) records shall be maintained on site to record actual times and durations of all startups, shutdowns, quantity of each fuel used, hours of daily operation, and total cumulative hours of operation during each calendar year.

26. A Continuous Emission Monitoring System (CEMS) shall be installed and calibrated to measure and record the concentration and hourly mass emission rate of oxides of nitrogen (NOx), the hourly average concentration and daily mass emission rate of carbon monoxide (CO), and the percent oxygen (O_2) in the exhaust gas, including during the commissioning period. The CEMS shall be installed and operational prior to first fuel firing.

27. The NOx and O_2 CEMS shall be installed, certified and maintained in accordance with applicable federal regulations including the requirements of Sections 75.10 and 75.12 of Title 40, Code of Federal Regulations Part 75 (40 CFR 75), the performance specifications of Appendix A of 40 CFR 75, the quality assurance procedures of Appendix B of 40 CFR 75, and a CEMS protocol approved by the District. At least 60 days prior to the operation the CEMS, the applicant shall submit a CEMS operating protocol to the District for written approval. This protocol shall also include provisions for operation during the commissioning period.

28. The CO CEMS shall be installed, certified and maintained in accordance with applicable federal regulations including the requirements of 40 CFR 60, Appendix B and F, and a CEMS protocol approved by the District. At least 60 days prior to the operation of the CEMS, the applicant shall submit a CEMS operating protocol to the District for written approval. This protocol shall also include provisions for operation during the commissioning period.

29. The District shall be notified in writing at least two (2) weeks prior to any changes made in the CEMS software that affect the measurement, calculation or correction of data displayed and/or recorded by the CEMS.

30. Any violation of any emission standard as indicated by the CEMS shall be reported to the District's compliance division within 96 hours after such occurrence.

31. On and after initial startup, this equipment shall be equipped with continuous parametric monitors to measure (or calculate) and to record the following operational characteristics:
    a. hours of operation (hours),
    b. natural gas flow rate (scfh),
    c. exhaust gas temperature (°F),
    d. SCR average temperature (°F),
    e. ammonia injection rate (lbs/hr),
    f. water injection rate (lbs/hr) for NOx control,
    g. power output (MW).

    These monitors shall be installed, calibrated, and maintained in accordance with the manufacturer's recommended procedures and a protocol approved by the District. Such protocol shall be submitted to the District for written approval at least 60 days prior to initial startup. This protocol shall include, at a minimum, a description of the equipment used for direct measurement of operating characteristics and the methodology used to calculate the remaining operating characteristics. All monitors shall be in full operation at all times when the turbine is in operation.

32. Fuel flow meters shall be installed and maintained to measure the fuel flow rate corrected for temperature and pressure. Correction factors and constants shall be maintained on site and made available to the District upon request. The fuel flow meters shall meet the applicable quality assurance requirements of 40 CFR Part 75, Appendix D, Section 2.1.6.

33. Monthly and annual records of fuel usage shall be maintained and made available to the District upon request.

34. Monthly and annual records shall indicate actual times and duration of all startups, shutdowns, and quantity of fuel used.

35. The ammonia injection flow rate shall be continuously monitored, recorded and controlled. Records of ammonia injection rate and flow rate device calibration shall be maintained and made available to the District upon request.

36. A monitoring plan in conformance with 40 CFR 75.53 shall be submitted to EPA Region 9 and the District at least 45 days prior to the initial source test, as required in 40 CFR 75.62.

37. The exhaust stack shall be equipped with source test ports and platforms to allow for the measurement and collection of stack gas samples consistent with all approved test protocols. The ports and platforms shall be constructed in accordance with San Diego Air Pollution Control District Method 3A, Appendix Figure 2, and approved by the District.

38. No later than 90 days after commencement of commercial operation (40CFR70.4(b)(2)), a Relative Accuracy Test Audit (RATA) and all other required certification tests shall be performed and completed on the permanent CEMS in accordance with 40 CFR Part 75 Appendix A performance specifications. At least 45 days prior to the test date, the applicant shall submit a test protocol to the District for approval.

Additionally, the District shall be notified a minimum of 45 days prior to the test so that observers may be present. Within 30 days of completion of this test, a written test report shall be submitted to the District for approval.

39. Within 60 days after the initial startup, an initial source test shall be conducted by an independent, ARB approved tester or the District, at the applicant's expense, to determine initial compliance with the emission standards of this Authority to Construct. A source test protocol shall be submitted to the District for approval at least 30 days prior to the initial source test. The source test protocol shall comply with the following requirements:

    a. Measurements of outlet oxides of nitrogen (NOx), carbon monoxide (CO), and stack gas oxygen content (O_2%) shall be conducted in accordance with the District Source Test Method 100, or the Air Resources Board (ARB) Test Method 100 as approved by the U.S. Environmental Protection Agency (EPA).

    b. Measurements of outlet volatile organic compound (VOC) emissions shall be conducted in accordance with the San Diego Air Pollution Control District Methods 25A and/or 18.

    c. Measurements of particulate matter less than 10 microns (PM10) shall be conducted in accordance with the U.S. Environmental Protection Agency (EPA) Test Methods 201A and 202.

    d. Measurements of outlet ammonia shall be conducted in accordance with Bay Area Air Quality Management District (BAAQMD) Test Method ST-1B.

    e. Source testing shall be performed at or above the normal load level, as specified in 40 CFR Part 75, Appendix A, Section 6.5.2.1 D, and at no less than 80% of the unit's rated load, unless it is demonstrated to the satisfaction of the District that the unit cannot operate under these conditions.

40. Within 30 days after completion of the initial source test, a final test report shall be submitted to the District for review and approval. The testing contractor shall include as part of the test report a certification that to the best of their knowledge the report is a true and accurate representation of the test conducted and the results.

41. In the event the initial source test results do not demonstrate compliance with District Rules and Regulations and emissions standards specified herein, to the satisfaction of the District, the applicant shall take corrective action to meet these standards. Any proposed corrective action that would result in a modification to the equipment shall require an application for a District Authority to Construct for such modification.

42. This unit shall be source tested to demonstrate compliance with the NOx, CO, VOC, PM_{10} and ammonia emission standards of this permit using District approved methods. The source test and the NOx and CO RATA tests shall be conducted in accordance with the RATA frequency requirements of 40 CFR 75, Appendix B, Sections 2.3.1 and 2.3.3.

43. Based on source testing, additional monitoring parameters may be established to ensure compliance. Operating characteristics monitored by continuous parametric monitors may also be restricted to specified ranges or limits, as determined by the District, based upon manufacturer's recommended operating procedures and initial compliance source test results.

44. The applicant shall obtain a modification to the Federal Title V Operating Permit in accordance with District Regulation XIV prior to initial startup of this equipment.

45. All records required by this permit shall be maintained for a minimum of five years and made available to District personnel upon request.

46. Access, facilities, utilities and any necessary safety equipment for source testing and inspections shall be provided upon request of the Air Pollution Control District.

47. The applicant shall, upon determination of applicability and written notification by the District, comply with all applicable requirements of the Air Toxic "Hot Spots" Information and Assessment Act (California Health and Safety Code Section 2230 Et. Seq.).

48. This Air Pollution Control District Authority to Construct does not relieve the holder from obtaining permit or authorizations required by other governmental agencies.

ATTACHMENT A

APPROVAL OF AIR QUALITY IMPACT ANALYSIS

AIR QUALITY IMPACT ANALYSIS

FINAL REVIEW REPORT

MMC CHULA VISTA
APPLICATION 985092 and 985093

October 2, 2007

Prepared For
Mechanical Engineering
San Diego Air Pollution Control District
10124 Old Grove Road
San Diego, California 92131

Prepared By
Ralph DeSiena
Monitoring and Technical Services
San Diego Air Pollution Control District
10124 Old Grove Road
San Diego, California 92131

1.0 INTRODUCTION

An Air Quality Impact Analysis (AQIA) was performed for the MMC Chula Vista, LLC (MMC) Facility by Atmospheric Dynamics of Santa Barbara, CA. This report focuses on the AQIA analysis results provided in the original and subsequent analysis performed.

2.0 PROJECT DESCRIPTION

MMC is proposing to modify its present power generation facility located at 3497 Main Street, Chula Vista, CA by:

Removing the Pratt and Whitney "twin pack" Model FT4/GG4 (44 MW).

Install two GE LM 6000 turbines rated at 93 MW total and one 550 kW emergency generator.

3.0 AIR QUALITY IMPACT ANALYSIS

Dispersion modeling was conducted for operational emissions of NO_2, CO, SO_2, $PM_{2.5}$ and PM_{10}. The applicant and their consultant (Atmospheric Dynamics) worked closely with the District in developing modeling and analysis procedures in support of demonstrating compliance with all applicable NSR requirements.

In addition, during the commissioning and startup periods hourly emissions of CO and NO_x are expected to be much higher since the control system will not yet be optimized during the commissioning phase and not operating at optimum conditions during startups. CO and NO_x emissions were modeled to determine whether emissions during these time periods would impact the State and/or Federal Ambient Air Quality Standards for CO and NO_2.

The original results submitted included worst case monitored background data taken from the District's monitoring station at Chula Vista during the years 2003-2005. The results presented here have been updated to reflect the most recent background data years 0f 2004-2006.

These procedures are discussed in the following subsections.

3.1 MODELING METHODOLOGIES

EPA's Aermod Prime model (Version 04300) was used to determine maximum predicted NO_2, CO, SO_2, $PM_{2.5}$ and PM_{10}.concentrations in the project vicinity. The modeling was performed in accordance with EPA guidance and District standard procedures. Regulatory default settings were used. The receptor grid was sufficiently dense to identify maximum impacts.

3.2 METEOROLOGICAL DATA USED FOR DISPERSION MODELING

Meteorological data used for EPA's Aermod Prime model consisted of the following data for the 2000 through 2002 time period. The data was processed by the District using EPA's Aermet meteorological data processor (Version 04300) to produce Aermod ready files.

- Wind speed, wind direction, standard deviation of the horizontal wind direction and temperature from the District's Chula Vista monitoring station.

- Twice-daily upper-air soundings from Miramar, NAS.

- Cloud height and total opaque cloud amount from Lindbergh Field, San Diego, CA.

- Wind speed, wind direction and temperature data from Lindbergh Field, San Diego, CA for replacement of missing data in the Chula Vista data set.

- Wind speed, wind direction and temperature data with height from the District's wind profiler with Rass located on Point Loma, San Diego, CA.

Monthly values for Albedo, Bowen Ratio and Surface Roughness provided in Table 3-1 were input to the AERMET model. Because of the mainly urban land use surrounding the monitoring site in Chula Vista, we assumed one 360 degree sector with an urban classification.

Table 3.1 Monthly Input Boundary Layer Parameters to AERMET

Month	Albedo	Bowen Ratio	Surface Roughness
Jan	.18	1.0	1.0
Feb	.18	1.0	1.0
Mar	.14	0.5	1.0
Apr	.14	1.0	1.0
May	.16	4.0	1.0
Jun	.16	4.0	1.0
Jul	.16	4.0	1.0
Aug	.16	4.0	1.0
Sep	.16	4.0	1.0
Oct	.16	2.0	1.0
Nov	.18	1.0	1.0
Dec	.18	1.0	1.0

The factors are based on Table 4-1, 4-2, and 4-3 of the User's Guide to AERMET. We assumed Nov, Dec, Jan, and Feb were in the "autumn" category, Mar and April were "spring", and May, Jun, July, Aug, and Sep were "summer". San Diego does not have snow cover so there are no months that would be categorized as winter.
For the Bowen ratio we used Table 4-2c for Nov, Dec, Jan, Feb, and Mar. These months are during the rainy season in San Diego so we used the wet conditions table. For April and October we used Table 4-2b for average moisture conditions to represent the transition between the wet and dry season. For the rest of the summer months we used Table 4-2a for dry moisture conditions during the dry season.

4.0 AIR QUALITY IMPACT ANALYSIS RESULTS

In accordance with EPA and San Diego Air Pollution Control District New Source Review Guidance and the modeling methodologies described above, maximum predicted concentrations associated with facility operations were determined for each criteria

pollutant and the applicable averaging period during Normal, Startup and Commissioning conditions. The maximum predicted concentrations were added to worst-case background concentrations for comparison to Federal and State Ambient Air Quality Standards. Worst case background concentrations were determined from the review of 3 years (2004-2006) of monitoring data taken from the District's Chula Vista monitoring station, which was deemed to be most representative of air quality in the facility area. Table 5-1 summarizes the worst case background concentrations.

TABLE 4.1
MAXIMUM BACKGROUND CONCENTRATIONS, CHULA VISTA, 2004-2006 (µg/m^3)

Pollutant	Averaging Time	2004	2005	2006
NO_2	1-hour	135.5[a]	133.6	**139.2**
	Annual	30.1	30.1	**32.0**
SO_2	1-hour	**110.0**	41.9	44.5
	3-hour	**55.0**	23.6	34.0
	24-hour	**41.9**	13.1	15.7
	Annual	**7.9**	7.9	7.9
CO	1-hour	**4785**	3436	3313
	8-hour	**3043**	2613	2699
PM_{10}	24-hour	45	**53**	52
	Annual	26.5	**27**	26.3
$PM_{2.5}$	24-hour	**35**[b]	33[b]	28[b]
	Annual	**12.2**	11.8	11.2
	National 3-Year Average [c]	**13**	12	11

Source: California Air Quality Data, California Air Resources Board website; EPA AIRData website. Reported values have been rounded to the nearest tenth of a µg/m^3 except for PM_{10} which were already rounded to the nearest integer.

Notes:

a. Bolded values are the highest during the three years and are used to represent background concentrations.

b. 24-hour average $PM_{2.5}$ concentrations shown are 3-year Average 98th percentile values rather than highest values because compliance with the ambient air quality standards is based on 98th percentile readings.

c. To attain the annual $PM_{2.5}$ NAAQS, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.

Table 4.2 contains emission rates and stack parameters modeled for the facility normal operations as well as for facility startup and shutdown condition modeling.

Table 4.3 provides the summary of project modeled maximum impacts for normal operating conditions, including worst case ambient background concentrations, compared with Federal and California Ambient Air Quality Standards (AAQS).

Table 4.4 provides startup/shutdown emission rates for each turbine.

Table 4.5 provides the summary of project modeled maximum impacts for facility startup and shutdown conditions, including worst case ambient background concentrations, compared with Federal and California Ambient Air Quality Standards (AAQS).

The modeling analysis for startup and shutdown conditions consisted of the maximum short-term NO_x and CO emissions rates. $PM_{2.5}$, PM_{10} and SO_2 startup emissions were not modeled since they are not significantly different than during normal operations.

The modeling analysis for the commissioning period conditions consisted of the maximum short-term NO_x and CO emissions rates. $PM_{2.5}$, PM_{10} and SO_2 commissioning period emissions were not modeled since they are not significantly different than during normal operations.

Table 4.6 provides commissioning period emission rates for each turbine.

Table 4.7 provides the maximum modeled concentration for applicable pollutants and averaging periods of concern during the commissioning period.

Fumigation analyses with the USEPA Model SCREEN3 (version 96043) were conducted for inversion breakup fumigation impacts (since the MMC site location is greater than 3000 meters from San Diego Bay, shoreline fumigation impacts are not expected to occur based on USEPA guidance given in *"Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised"* (EPA-454/R-92-019)).
Inversion breakup fumigation impacts of 1.085 micrograms/cubic meter (ug/m3) for a unitized emission rate (1 gram/second, g/s) were predicted to occur at 17,892 meters from the two turbines (no inversion breakup fumigation impacts were predicted to occur by SCREEN3 for emissions from the much lower emergency generator stack). These results are predicted to occur by SCREEN3 for rural conditions of F stability and 2.5 m/s wind speeds at the stack release heights. Since the site vicinity is urban in nature, SCREEN3 impacts were evaluated in both rural and urban modes for the turbine stacks at the inversion breakup distance of 17,892 meters for all SCREEN3 meteorological conditions. At this distance, the maximum urban impact was 2.38 times higher than the maximum rural impact (i.e., 1.013 ug/m3 vs. 0.4254 ug/m3 for 1 g/s emissions). Thus, the inversion breakup fumigation impact was adjusted to 2.583 ug/m3 for a unitized emission rate to account for urban dispersion conditions (i.e., 2.38 x 1.085 ug/m3). At the inversion breakup distance of 17,892 meters, the maximum emergency generator impact was 1.682 ug/m3 for a 1 g/s emission rate under urban conditions for all SCREEN3 meteorological conditions.
These unitized impacts were used to calculate 1-hour inversion breakup impacts for all pollutants by multiplying the unitized impacts by the pollutant emission rates (in g/s). The fumigation impacts from the turbines are added to the emergency generator impacts at the same location to obtain combined pollutant impacts for the facility.

Pollutant /Avg.Time	Impacts (ug/m3) at Inversion Breakup Location			Maximum Facility Impacts from AERMOD
	Fumigation Impacts for Turbines	Emer.Gen Impacts	Total Impacts	
NOx 1-hour	2.729	0.547	3.276	114.90
SO2 1-hour	0.718	0.035	0.753	7.35
CO 1-hour	4.016	0.516	4.532	108.54

As shown above, these fumigation impacts are very much less than the maximum facility AERMOD impacts predicted to occur in the immediate vicinity of the project site under normal operating conditions. Similarly, it can be shown that maximum SCREEN3 impacts at all offsite locations under urban conditions are very much higher than the fumigation impacts. Since 1-hour fumigation impacts are less than the maximum overall SCREEN3 and AERMOD 1-hour impacts, no further analysis of additional short-term

averaging times (3-hour, 8-hour, or 24-hour) is required as described in Section 4.5.3 of *"Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised"* (EPA-454/R-92-019).

5.0 CONCLUSION

The results of the modeling indicate that the facility commissioning, startup and normal operations will not cause or contribute to an exceedance of the Federal and California Ambient Air Quality Standards for SO_2, CO, $PM_{2.5}$ and NO_2.

The results also demonstrate that facility operations would not cause or contribute to an exceedance of the PM_{10} Federal Ambient Air Quality. Since the project area is designated non-attainment for the current California Ambient Air Quality Standards for PM_{10} additional modeling was considered in order to determine whether the facility would cause additional violations of the PM_{10} 24 hour standard. No additional analysis was performed with regard to the annual standards.

> It should be noted that predicted concentrations for PM_{10} did not exceed the EPA specified NSR 24-hour or Annual Significant Impact Levels (SIL). Predicted impacts less than SILs are normally considered to not significantly affect compliance with Federal Ambient Air Quality Standards regardless of the background level. Specifically in non-attainment areas, project impacts less than the SILs are deemed to not cause or contribute to violations of the Federal Ambient Air Quality Standard. This can be considered the case for California Ambient Air Quality Standards as well.

Since the initial modeling estimated maximum 24 Hour PM_{10} impacts of approximately 2.87 $\mu g/m^3$, additional AERMOD modeling would be performed for all days in the 2004-2006 period that 24 Hour PM_{10} background concentrations were between 47 μ/m^3 and 50 $\mu g/m^3$ (California Standard) to determine whether additional violations would result from facility operations. There were no monitoring days that concentrations were measured within this range (highest monitored value less than the California Standard was 4 $\mu g/m^3$ and therefore it can be concluded that facility operations would not cause or contribute to additional violations of the California 24 Hour Ambient Air Quality Standard for PM_{10}.

Table 4.2 Stack Parameters and Emission Rates for Refined AERMOD Modeling								
					Emission Rates (g/s)			
	Stack Height (m)	Stack Diam (m)	Stack Temp (deg K)	Exhaust Velocity (m/s)	NO_X	SO_2	CO	$PM_{10/2.5}$
Averaging Period: 1-hour for Normal Operating Conditions for CO and NOx Emissions								
Turbines (each)	21.336	3.9624	684.8	22.75	0.533	N/A	0.780	N/A
Emergency Generator	4.572	0.2540	787.6	60.16	0.325	N/A	0.307	N/A
Averaging Period: 1-hour for Normal Operating Conditions for SO_2 Emissions								
Turbines (each)	21.336	3.9624	681.5	14.92	N/A	0.139	N/A	N/A
Emergency Generator	4.572	0.2540	787.6	60.16	N/A	0.0208	N/A	N/A
Averaging Period: 3-hours for Normal Operating Conditions								
Turbines (each)	21.336	3.9624	681.5	14.92	N/A	0.139	N/A	N/A
Emergency Generator	4.572	0.2540	787.6	60.16	N/A	6.94E-3	N/A	N/A
Averaging Period: 8-hours for Normal Operating Conditions								
Turbines (each)	21.336	3.9624	684.8	22.75	N/A	N/A	0.780	N/A
Emergency Generator	4.572	0.2540	787.6	60.16	N/A	N/A	3.84E-2	N/A
Averaging Period: 24 hours for Normal Operating Conditions								
Turbines (each)	21.336	3.9624	681.5	14.92	N/A	0.139	N/A	0.630
Emergency Generator	4.572	0.2540	787.6	60.16	N/A	8.67E-4	N/A	7.39E-4
Averaging Period: Annual for Normal Operating Conditions[1]								
Turbines (each)	21.336	3.9624	707.6	22.32	0.467	0.091	N/A	0.412
Emergency Generator	4.572	0.2540	787.6	60.16	1.93E-3	1.24E-4	N/A	1.05E-4
Averaging Period: 1-hour for Turbine Start-up/Shutdown Conditions								
Turbines (each)	21.336	3.9624	684.8	22.75	2.432	N/A	1.802	N/A
Averaging Period: 8-hours for Turbine Start-up/Shutdown Conditions								
Turbines (each)	21.336	3.9624	684.8	22.75	N/A	N/A	0.981	N/A
[1]Annual averaging periods include start-up/shutdown emissions, where applicable.								

Table 4.3 Air Quality Impact Summary for Normal Operating Conditions								
Pollutant	Avg. Period	Maximum[a] Concentration ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	Class II Significance Level ($\mu g/m^3$)	SILs ($\mu g/m^3$)	Ambient Air Quality CAAQS/NAAQS ($\mu g/m^3$)	Ambient Air Quality CAAQS/NAAQS ($\mu g/m^3$)
NO_2	1-hour	114.90	139.2	254.1	-	19	470	-
	Annual	0.34	32	32.34	1	1	-	100
PM10[1]	24-hour	2.87	53	55.87	5	5	50	150
	Annual	0.29	27	27.29	1	1	20	50
PM2.5[1]	24-hour	2.87	28[a]	30.87	5	5	-	35
	Annual	0.29	11[b]	11.29	1	1	12	15
CO	1-hour	108.54	3043	3152	2000	2000	23,000	40,000
	8-hour	8.27	4785	4793	500	500	10,000	10,000
SO_2	1-hour	7.35	110	117	-	-	655	-
	3-hour	2.42	55	57.4	25	25	1300	1,300
	24-hour	0.64	41.9	42.5	5	5	105	365
	Annual	0.07	8	8.07	1	1	-	80

a. 24-hour average $PM_{2.5}$ concentrations shown are 3-year Average 98th percentile values rather than highest values because compliance with the ambient air quality standards is based on 98th percentile readings.

b. To attain the annual $PM_{2.5}$ NAAQS, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 $\mu g/m^3$.

Table 4.4 Facility Startup Emission Rates for Each Turbine			
Scenario	NOx	CO	VOC
Cold Start, Lbs/hr	19.3	14.3	1.4
Hot Start, Lbs/hr	8.8	9.2	1.4
Warm Start, Lbs/hr	12.2	10.8	1.4
Shutdown, Lbs/hr	7.8	8.9	1.4
All startup sequences are 30 minutes or less. Shutdown is 10 minutes.			

Table 4.5 Startup and Shutdown Modeling Results

Pollutant	Avg. Period	Maximum[a] Concentration ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	Class II Significance Level ($\mu g/m^3$)	Ambient Air Quality CAAQS/NAAQS ($\mu g/m^3$)	($\mu g/m^3$)
NO_2	1-hour	37.54	139.2	176.74	-	470	-
CO	1-hour	27.81	4785	4813	2000	23,000	40,000
	8-hour	9.09	3043	3052	500	10,000	10,000

Table 4.6 Commissioning Emissions Used for Modeling Analysis for Each Turbine

Pollutant	Emission Rate
NO_x 1-hour	51 lb/hr
CO 1-hour	45 lb/hr
CO 8-hour	360 lbs/8-hours

Table 4.7 Commissioning Period Modeling Results

Pollutant	Avg. Period	Maximum[a] Concentration ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	Class II Significance Level ($\mu g/m^3$)	Ambient Air Quality CAAQS/NAAQS ($\mu g/m^3$)	($\mu g/m^3$)
NO_2	1-hour	99.2	139.2	238.4	-	470	-
CO	1-hour	87.5	4785	4872.5	2000	23,000	40,000
	8-hour	52.5	3043	3095.5	500	10,000	10,000

The AERMOD modeling analyses for the MMC Chula Vista Facility were re-analyzed with the following changes:

1. Meteorological data re-processed by the SDAPCD with the most recent version of AERMET (V06341);
2. Receptor grids re-processed with the most recent version of AERMAP (V06341);
3. Impacts re-evaluated with the revised meteorological and the most recent version of AERMOD (V07026);
4. Emergency generator deleted from facility design;
5. Turbine PM emissions revised to 3.0 lbs/hr/turbine; and
6. Annual emissions revised to 3500 hours/year normal operations (fogger off), 500 hours/year with fogger on; 200 hours/year cold starts, and 200 hours/year warm starts.

With the deletion of the emergency generator, the proposed facility now consists of two identical stacks. Therefore, the revised modeling analyses were performed as screening analyses with each stack modeled at 1.0 g/s (i.e., no refined modeling analyses with the emergency generator were required). The resulting unitized concentrations from the revised screening analysis were multiplied by the turbine emission rate (g/s/turbine) to determine maximum facility impacts. The changes to the modeling results are shown below in the revised tables from AFC Section 5.1 and Appendix 5.1.

In addition to the revised impacts shown on the following tables, revised commissioning impacts (not shown in tables previously) were 99.2, 87.5, and 52.4 ug/m^3 for 1-hour NO_2, 1-hour CO, and 8-hour CO impacts, respectively, nearly identical to the impacts reported previously.

TABLE 5.1-21
Stack Parameters and Emission Rates for Worst-Case Source Conditions from Screening AERMOD Modeling

	Stack Height (m)	Stack Diam (m)	Stack Temp (deg K)	Exhaust Velocity (m/s)	Emission Rates (g/s) NO_X	SO_2	CO	$PM_{10/2.5}$
Averaging Period: 1-hour for Normal Operating Conditions for CO and NOx Emissions								
Turbines (each)	21.336	3.9624	684.8	22.75	0.533	N/A	0.780	N/A
Averaging Period: 1-hour for Normal Operating Conditions for SO_2 Emissions								
Turbines (each)	21.336	3.9624	681.5	14.92	N/A	0.139	N/A	N/A
Averaging Period: 3-hours for Normal Operating Conditions								
Turbines (each)	21.336	3.9624	681.5	14.92	N/A	0.139	N/A	N/A
Averaging Period: 8-hours for Normal Operating Conditions								
Turbines (each)	21.336	3.9624	684.8	22.75	N/A	N/A	0.780	N/A
Averaging Period: 24 hours for Normal Operating Conditions								
Turbines (each)	21.336	3.9624	681.5	14.92	N/A	0.139	N/A	0.378
Averaging Period: Annual for Normal Operating Conditions*								
Turbines (each)	21.336	3.9624	707.6	22.32	0.332	0.070	N/A	0.190
Averaging Period: 1-hour for Turbine Start-up/Shutdown Conditions								
Turbines (each)	21.336	3.9624	684.8	22.75	2.432	N/A	1.802	N/A
Averaging Period: 8-hours for Turbine Start-up/Shutdown Conditions								
Turbines (each)	21.336	3.9624	684.8	22.75	N/A	N/A	0.951	N/A

* Annual averaging periods include start-up/shutdown emissions, where applicable.

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TABLE 5.1-22
Air Quality Impact Summary for Normal Operating Conditions

Pollutant	Avg. Period	Maximum Concentration ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	Class II Significance Level ($\mu g/m^3$)	SIL ($\mu g/m^3$)	Ambient Air Quality CAAQS/NAAQS ($\mu g/m^3$)	Ambient Air Quality CAAQS/NAAQS ($\mu g/m^3$)
NO_2	1-hour	8.2	192	200	-	19	470	-
	Annual	0.23	34	34.2	1	1	-	100
PM_{10}	24-hour	1.71	65	66.7	5	5	50	150
	Annual	0.13	27	27.1	1	1	20	50
$PM_{2.5}$	24-hour	1.71	41	42.7	5	5	-	65
	Annual	0.13	14	14.1	1	1	12	15
CO	1-hour	12.04	7886	7898	2000	2000	23,000	40,000
	8-hour	7.21	6000	6007	500	500	10,000	10,000
SO_2	1-hour	2.84	110	113	-	-	655	-
	3-hour	1.93	55	56.9	25	25	1300	1,300
	24-hour	0.63	39	39.6	5	5	105	365
	Annual	0.04	11	11.04	1	1	-	80

TABLE 5.1-24
Startup and Shutdown Modeling Results

Pollutant	Avg. Period	Maximum Concentration ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	Class II Significance Level ($\mu g/m^3$)	Ambient Air Quality CAAQS/NAAQS ($\mu g/m^3$)	Ambient Air Quality CAAQS/NAAQS ($\mu g/m^3$)
NO_2	1-hour	37.54	192	230	-	470	-
CO	1-hour	27.81	7886	7914	2000	23,000	40,000
	8-hour	8.79	6000	6009	500	10,000	10,000

Deleted: 114.90
Deleted: 307
Deleted: 0.34
Deleted: 34
Deleted: 2.87
Deleted: 7
Deleted: 9
Deleted: 0.29
Deleted: 29
Deleted: 2.87
Deleted: 3
Deleted: 9
Deleted: 0.29
Deleted: 29
Deleted: 108.54
Deleted: 9
Deleted: 5
Deleted: 8.27
Deleted: 8
Deleted: 7.35
Deleted: 7
Deleted: 2.42
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Deleted: 4
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Deleted: 7
Deleted: 7
Deleted: 9.09

ATTACHMENT B

APPROVAL OF HEALTH RISK ASSESSMENT

7084A

Rule 1200 Health Risk Assessment Review

Facility Name:	MMC Chula Vista
Facility ID:	7084A
Application(s):	985092, 985093, 985106
Project Engineer:	Arthur Carbonell
Toxics Risk Analyst:	Dick Brightman
Date Completed by Toxics:	11/5/07
HRA Tool Used:	**HARP-ISC (HarpXpress)**

The following estimated risks are valid only for the input data provided by the facility.

Estimated Risks for the Project

Maximum Offsite Individual Cancer Risk	1.53 per million LCP
Maximum Offsite Chronic Non-Cancer Health Hazard Index	0.00228
Maximum Offsite Acute Health Hazard Index	0.0898

Input Data Provided by Project Engineer

Type of Source:	2 natural gas-fired turbines, 1 diesel black start engine
Controls Description:	SCR
T-BACT:	Yes

Process Data for Diesel Engines

Operation Parameter	Value
Diesel particulate emission factor (g/hp-hr)	0.15
Fuel consumption (gallons/hr)	48
Engine horsepower (bhp)	851
Annual hours of operation	50

Note: TACs evaluated are: arsenic, benzene, copper, formaldehyde, hydrochloric acid, mercury, nickel, toluene, xylene, diesel particulate

Process Data for Gas Turbines

Operation Parameter	Value
Turbine Rating (MMBTU/hr)	468.8
HHV (BTU/scf)	1015
Fuel consumption (MMscf/hr)	0.4619
Annual hours of operation	4000

Worst Case Potential Emissions:

Turbines (each)

CHEMICAL NAME	Emission Factor lb/MMscf	Acute Emission Rate lb/hr	Annual Emission Rate lb/yr
ACETALDEHYDE	4.08E-02	1.88E-02	7.54E+01
ACROLEIN	6.50E-03	3.00E-03	1.20E+01
AMMONIA	5% slip	3.16E+00	1.26E+04
BENZENE	1.22E-02	5.64E-03	2.25E+01
BUTADIENE, 1,3-	4.00E-04	1.85E-04	7.39E-01
ETHYL BENZENE	3.26E-02	1.51E-02	6.02E+01
FORMALDEHYDE	7.24E-01	3.35E-01	1.34E+03
NAPHTHALENE	1.30E-03	6.00E-04	2.40E+00
POLYCYCLIC AROM. HC (PAH)	2.20E-03	1.02E-03	4.06E+00
TOLUENE	1.33E-01	6.12E-02	2.45E+02
XYLENES	6.53E-02	3.02E-02	1.21E+02

Diesel Black Start ICE

CHEMICAL NAME	Emission Factor lb/1000 gal	Acute Emission Rate lb/hr	Annual Emission Rate lb/yr
DIESEL PARTICULATE (g/hp-hr)	0.15 g/hp-hr		1.41E+01
ACROLEIN	3.39E-02	1.63E-03	
ARSENIC COMPOUNDS	1.60E-03	7.68E-05	
BENZENE	1.86E-01	8.94E-03	
COPPER AND COMPOUNDS	4.10E-03	1.97E-04	
FORMALDEHYDE	1.73E+00	8.29E-02	
HYDROCHLORIC ACID	1.86E-01	8.94E-03	
MERCURY AND COMPOUNDS (INORGANIC)	2.00E-03	9.60E-05	
NICKEL AND NICKEL COMPOUNDS	3.90E-03	1.87E-04	
TOLUENE	1.05E-01	5.06E-03	
XYLENES	4.24E-02	2.04E-03	

Release Parameters:

Turbines

Stack Release Parameters	Value
Stack Height (ft)	70
Stack Diameter (ft)	13
Temperature deg F	814
Vertical Airflow (acfm)	583226

Diesel Black Start ICE

Stack Release Parameters	Value
Stack Height (ft)	15
Stack Diameter (ft)	0.83
Temperature deg F	958
Vertical Airflow (acfm)	6459

Discussion

The HRA was conducted in accordance with EPA and OEHHA guidance and District standard procedures. Three point sources were modeled with refined air dispersion modeling using EPA's ISC3 and ARB's HARP model (HARP Xpress), actual San Diego Lindbergh Field 1996-1998 meteorology data, and urban dispersion coefficients. Building downwash effects were calculated using the EPA BPIP model. The 50 meter-spacing receptor grid was sufficiently dense to identify maximum impacts. Health impacts were estimated at points of maximum concentration.

The District re-calculated the risk using District default emission factors based on EPA AP-42 for gas turbines instead of the CATEF emission factors in the submitted HRA, and Ventura County (2001) emission factors for speciated diesel exhaust (VOCs and metals) for acute diesel impacts. The District found that the diesel particulate emissions were underestimated in the submitted HRA (14.1 lb/yr vs 0.182 lb/yr in the submitted HRA). The submitted HRA ignored acute diesel impacts, and calculated risk due to turbines and that due to diesel separately. The District remedied this in its re-calculation. The District used a deposition velocity of 0.05 m/s since it is not assured that particulate emissions are controlled. The cancer risk increased by a factor of 10 but is still less than the level of concern for TBACT. Chronic and acute risks were unchanged or less than estimated in the submitted HRA.

ATTACHMENT C

RESPONSES TO PUBLIC COMMENTS

RESPONSE TO COMMENTS ON THE PRELIMINARY DETERMINATION OF COMPLIANCE (PDOC), FOR THE MMC CHULA VISTA GENERATING PROJECT (APPLICATION NOS. 985092-93)

CEC Comments:

1. **Emission Limits: The CEC would like mass emission limits of pounds per hour, per day, and per year for different operating scenarios (normal, startup/shutdown, and initial commissioning).**

   District Response: New conditions will be added to specify maximum hourly, daily and annual emission rates for NOx, CO and VOC's. While there is no direct measurement of VOC emissions with the CEMS, a CO/VOC surrogate relationship can be determined at the time of the initial compliance test and will assume to remain constant throughout the year. At the time of the annual renewal test, this surrogate relationship will be re-evaluated and updated, if necessary. Additionally, new conditions will be added to specify the maximum hourly NOx, CO and VOC emission during startups and shutdowns. Note that emissions evaluations assumed cold start conditions, being the worst-case scenario. Therefore, cold start limits will be assumed in the permit condition. Since this equipment is fired on natural gas only, Title IV only requires calculating SO_2 based on fuel sulfur content. A condition will be added to record fuel sulfur content on a quarterly basis (see Comment #5) but no continuous SO_2 monitors will be required. As there is no method of continuously monitoring PM_{10}, no additional requirement for this pollutant will be added.

2. **Commissioning Period Emissions: The CEC requests that a condition or conditions be added to address the following circumstances of the commissioning period:**
   - **a. specify emission monitoring and recordkeeping during commissioning;**
   - **b. require installation of control equipment after initial tuning;**
   - **c. require emissions to be minimized as much as feasible; and**
   - **d. require commissioning period emissions to be counted towards annual limits.**

   District Response:
   - a. The CEMS is required to be installed and operational prior to first fuel firing and can be used to monitor and record emissions during the commissioning period, even though the CEMS will not yet be certified. Permit conditions will be modified to ensure that the CEMS protocol will include provisions for operation during the commissioning period.
   - b. Commissioning period emissions are counted towards annual limits which therefore provides sufficient incentive for the applicant to install control equipment as soon as possible and to minimize emissions, especially during periods when no electricity is being generated.

c. A requirement that commissioning period emissions be minimized as much as feasible is too vague to be an enforceable permit condition.
d. Commissioning period emissions will be counted towards major source and PSD thresholds. They are not taken into account for annual emission limits based on BACT.

3. **New Source Performance Standards (NSPS) for Gas Turbines: The CEC suggests adding a condition requiring compliance with 40 CFR Subpart KKKK. The CEC recognizes that the District does not have EPA delegation to enforce this NSPS but would still like a condition requiring the applicant to provide an annual documentation showing compliance with the NSPS (i.e., letter from EPA) until the District receives such delegation.**

District Response: While the District understands the CEC's concerns in this matter, without EPA delegation the District does not have the authority to enforce any part of Subpart KKKK, including providing written proof of compliance. Only EPA can enforce this NSPS. Therefore, the District will not include any conditions directly relating to subpart KKKK. However, the monitoring as specified in the PDOC can be used to show compliance with this subpart.

4. **Ammonia Emissions Calculations: The CEC requests that a condition be added to calculate ammonia emissions to demonstrate compliance with the ammonia slip limit between annual source tests. An example of such a condition was provided.**

District Response: The District will include the proposed permit condition in the FDOC.

5. **Sulfur Oxides Emissions Monitoring: The CEC requests a condition to require monitoring of the sulfur content of fuel used to demonstrate compliance with 40 CFR Part 72.**

District Response: Condition No. 2 will be modified to include recordkeeping of fuel sulfur content.

6. **Title V Compliance: The CEC requests that a condition be added to specify compliance with Title V.**

District Response: The District will add a condition which will specify the requirements for updating the applicant's Title V Permit.

7. **<u>Notification of Non-Compliance:</u> The CEC suggests that a condition be added to require the applicant to notify the District within a certain time frame in case of violation of any permit condition. Currently, the conditions do not specify a method by which the District would be made aware of any non-compliant operation.**

   <u>District Response:</u> The District will add a condition which will require notification to the District's Compliance Group of any violation of emission standards as determined by the CEMS.

8. **<u>Calculated Emission Rates:</u> The emission rates reported in the PDOC and those provided by the applicant are marginally different. The CEC requests that the emission rates be standardized.**

   <u>District Response:</u> The differences between the two sets of emission rates stems from the calculation method used as well as assumptions for startup and shutdown conditions. District calculation methods and assumptions are outlined in the PDOC. The District calculations were based on emission concentrations. Emission limits in the PDOC are also based on concentration. Therefore, for consistency, District emissions will be used. However, at the request of the applicant, the calculations were reviewed and minor corrections are noted in the revised conditions.

No other comments were received.