Bay Area Air Quality Management District

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Permit Evaluation
and
Statement of Basis
for the

MAJOR FACILITY REVIEW PERMIT

for

Metcalf Energy Center, LLC
Facility #B2183

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Application 2805

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Title V Statement of Basis

A. Background

This facility is subject to the Operating Permit requirements of Title V of the federal Clean Air Act, Part 70 of Title 40 of the Code of Federal Regulations (CFR), and BAAQMD Regulation 2, Rule 6, Major Facility Review because it is a major facility as defined by BAAQMD Regulation 2-6-212. It is a major facility because it has the "potential to emit" (as defined by BAAQMD Regulation 2-6-218) more than 100 tons per year of the regulated air pollutants nitrogen oxides and carbon monoxide. This facility is also subject to the Title IV (Acid Rain) requirements of 40 CFR Part 72 because it will include gas turbines that are new affected utility units per 40 CFR Part 72.6(a) because they each serve a generator with a capacity greater than 25 MW.

Major Facility Operating permits (Title V permits) must meet specifications contained in 40 CFR Part 70 as contained in BAAQMD Regulation 2, Rule 6. The permits must contain all "applicable requirements" (as defined in BAAQMD Regulation 2-6-202), monitoring requirements, recordkeeping requirements, and reporting requirements. The permit holders must submit reports of all monitoring at least every six months and compliance certifications at least every year.

Pursuant to Regulation 2, Rule 6, section 416, the District has reviewed the terms and conditions of this Major Facility Review permit and determined that they are valid and correct. This review included an analysis of applicability determinations for all sources, including those that have been modified or permitted since the application for the initial Major Facility Review Permit was submitted to the District. The review also included an assessment of all monitoring in the permit for sufficiency to determine compliance.

In the Bay Area, state and District requirements are also applicable requirements and are included in the permit. These requirements can be federally enforceable or non-federally enforceable. All applicable requirements are contained in Sections I through VI of the permit.

Each facility in the Bay Area is assigned a facility identifier that consists of a letter and a 4-digit number. This identifier is also considered to be the identifier for the permit. The identifier for the Metcalf Energy Center, LLC is B2183.

This application is for the initial Major Facility Review permit for the Metcalf Energy Center, LLC.

B. Facility Description

The Metcalf Energy Center is a 600 MW natural gas-fired power plant located in the Coyote Valley area of southern San Jose, California, on a site that lies partially in the City of San Jose and partially in the County of Santa Clara. The facility applied for certification with the California Energy Commission in April 1999. The CEC approved a license for the facility in

2001, after a two-and-a-half year review process that included more than 50 public hearings.[1] The facility was constructed by Bechtel Enterprises Inc. from 2002-2005 and has been operated by Calpine Corporation since 2005. The Metcalf plant is a "merchant" plant, meaning that it sells all of the electricity it generates to the power grid.

The Metcalf Energy Center generates electricity using a "combined cycle" system comprising two combustion turbine generators (CTGs) that work in concert with two heat recovery steam generators (HRSGs) and a steam turbine generator (STG). The CTGs generate electricity by burning natural gas, which drives combustion turbine compressors and electric generators. Instead of being vented (and wasted), the exhaust steam from the CTGs is routed to the HRSGs to produce steam to power the STG to generate additional electricity. Through the use of the two cycles in tandem, the facility is able to be more efficient and use approximately 30% less fuel to generate the same amount of energy as an older plant.

C. Permit Content

The legal and factual basis for the permit follows. The permit sections are described in the order presented in the permit.

I. Standard Conditions

This section contains administrative requirements and conditions that apply to all facilities. If the Title IV (Acid Rain) requirements for certain fossil-fuel fired electrical generating facilities or the accidental release (40 CFR § 68) programs apply, the section will contain a standard condition pertaining to these programs. Many of these conditions derive from 40 CFR § 70.6, Permit Content, which dictates certain standard conditions that must be placed in the permit. The language that the District has developed for many of these requirements has been adopted into the BAAQMD Manual of Procedures, Volume II, Part 3, Section 4, and therefore must appear in the permit.

The standard conditions also contain references to BAAQMD Regulation 1 and Regulation 2. These are the District's General Provisions and Permitting rules.

II. Equipment

This section of the permit lists all permitted or significant sources. Each source is identified by an S and a number (e.g., S24).

Permitted sources are those sources that require a BAAQMD operating permit pursuant to BAAQMD Rule 2-1-302.

Pursuant to BAAQMD Regulation 2-6-239, significant sources are defined as those sources that have a potential to emit of more than 2 tons per year of a "regulated air pollutant" as defined by BAAQMD Regulation 2-6-222 or 400 pounds per year of a "hazardous air pollutant" as defined by BAAQMD Regulation 2-6-210.

[1] The CEC's final Commission Decision document, which chronicles in detail the CEC review process for this facility, is available at: http://www.energy.ca.gov/sitingcases/metcalf/documents/2001-10-05.COMMISSION_DECIS.PDF.

All abatement (control) devices that control permitted or significant sources are listed. Each abatement device whose primary function is to reduce emissions is identified by an A and a number (e.g., A-24). If a source is also an abatement device, such as when an engine controls VOC emissions, it will be listed in the abatement device table but will have an "S" number. An abatement device may also be a source (such as a thermal oxidizer that burns fuel) of secondary emissions. If the primary function of a device is to control emissions, it is considered an abatement (or "A") device. If the primary function of a device is a non-control function, the device is considered to be a source (or "S"). The Metcalf Energy Center has four abatement devices (A-1 through A-4) that control emissions from the facility's two combustion gas turbines (CTGs S-1 and S-3) and two heat recovery steam generators (HRSGs S-2 and S-4). The abatement devices are listed in Table II B.

The equipment section is considered to be part of the facility description. It contains information that is necessary for applicability determinations, such as fuel types, contents or sizes of tanks, etc. This information is part of the factual basis of the permit.

Each of the permitted sources has previously been issued a permit to operate pursuant to the requirements of BAAQMD Regulation 2, Permits. These permits are issued in accordance with state law and the District's regulations. The capacities in the permitted sources table are the maximum allowable capacities for each source, pursuant to Standard Condition I.J and Regulation 2-1-403.

Following are explanations of the differences in the equipment list between the time that the facility originally applied for a Title V permit and the permit proposal date:

Devices Permitted Since Application was submitted:

Metcalf Energy Center's original proposal did not include oxidation catalysts for the facility's combustion gas turbines (CTGs S-1 and S-3) or heat recovery steam generators (HRSGs S-2 and S-4). The California Energy Commission required the facility to install oxidation catalysts on the CTGs and HRSGs to abate toxic air contaminant emissions as a condition of the CEC's certification of the project. Metcalf applied for and received District permits for the oxidation catalysts (A-3 and A-4), and they have been added to the equipment list of this proposed Title V permit.

Devices with Changed Permit Status:

When the Metcalf Energy Center was originally proposed in 1999, two internal combustion (IC) engines, a natural gas fired emergency generator (S-6) and a fire pump diesel engine (S-7), would have been exempt from then-existing District permit requirements under BAAQMD Regulation 2, Rule 1. Regulation 2, Rule 1 was subsequently amended and both engines lost their permit exemptions since they each have a rated output in excess of 50 bhp. Metcalf applied for (through application 12560) and received District permits to operate the IC engines in 2005.

District permit applications not included in this proposed permit

None. This facility has no permit applications pending with the District.

III. Generally Applicable Requirements

This section of the permit lists requirements that generally apply to all sources at a facility including insignificant sources and portable equipment that may not require a District permit. If a generally applicable requirement applies specifically to a source that is permitted or significant, the standard will also appear in Section IV and the monitoring for that requirement will appear in Sections IV and VII of the permit. Parts of this section apply to all facilities (e.g., particulate, architectural coating, odorous substance, and sandblasting standards). In addition, standards that apply to insignificant or unpermitted sources at a facility (e.g., refrigeration units that use more than 50 pounds of an ozone-depleting compound) are placed in this section.

Unpermitted sources are exempt from normal District permits pursuant to an exemption in BAAQMD Regulation 2, Rule 1. They may, however, be specifically described in a Title V permit if they are considered "significant sources" as defined in BAAQMD Rule 2-6-239.

IV. Source-Specific Applicable Requirements

This section of the permit lists the applicable requirements that apply to permitted or significant sources. These applicable requirements are contained in tables that pertain to one or more sources that have the same requirements. The order of the requirements is:

- District Rules
- SIP Rules (if any) are listed following the corresponding District rules. SIP rules are District rules that have been approved by EPA for inclusion in the California State Implementation Plan. SIP rules are "federally enforceable" and a "Y" (yes) indication will appear in the "Federally Enforceable" column. If the SIP rule is the current District rule, separate citation of the SIP rule is not necessary and the "Federally Enforceable" column will have a "Y" for "yes". If the SIP rule is not the current District rule, the SIP rule or the necessary portion of the SIP rule is cited separately after the District rule. The SIP portion will be federally enforceable; the non-SIP version will not be federally enforceable, unless EPA has approved it through another program.
- Other District requirements, such as the Manual of Procedures, as appropriate.
- Federal requirements (other than SIP provisions)
- BAAQMD permit conditions. The text of BAAQMD permit conditions is found in Section VI of the permit.

Section IV of the permit contains citations to all of the applicable requirements. The text of the requirements is found in the regulations, which are readily available on the District or EPA websites, or in the permit conditions, which are found in Section VI of the permit. All monitoring requirements are cited in Section IV. Section VII is a cross-reference between the limits and monitoring requirements. A discussion of monitoring is included in Section C.VII of this permit evaluation/statement of basis.

Complex Applicability Determinations

Title IV, Acid Rain 40 CFR Part 72

This facility is subject to the Acid Rain requirements of 40 CFR Part 72, because it employs gas turbines that are utility units that each serve a generator with a capacity greater than 25 MW pursuant to 40 CFR Part 72.6.

Compliance Assurance Monitoring (CAM) – 40 CFR Part 64

The potential to emit for the gas turbines and heat recovery steam generators combined is greater than 100 tons/year for NOx and CO. The gas turbines are exempt from CAM requirements for NOx per 40 CFR Part 64.2(b)(iii), and 40 CFR Part 64.2(b)(vi). The gas turbines are exempt from CAM requirements for CO per 40 CFR Part 64.2(b)(vi). The NOx and CO CEMs meet the requirements for a continuous compliance determination method contained in 40 CFR Part 64.1. The NOx and CO CEMs are a required monitoring method by the Part 70 (Title V) operating permit.

112(j)

This facility is not subject to section 112(j) of the Clean Air Act since it is not a major source for hazardous air pollutants (HAP) as defined by 112(a)(1) and 112(b)(1). The HAP emission calculations for the MEC are listed in the Final Determination of Compliance that can be viewed on the California Energy Commission website as described earlier in this document.

V. Schedule of Compliance

A schedule of compliance is required in all Title V permits pursuant to BAAQMD Regulation 2-6-409.10 which provides that a major facility review permit shall contain the following information and provisions:

"409.10 A schedule of compliance containing the following elements:

- 10.1 A statement that the facility shall continue to comply with all applicable requirements with which it is currently in compliance;
- 10.2 A statement that the facility shall meet all applicable requirements on a timely basis as requirements become effective during the permit term; and
- 10.3 If the facility is out of compliance with an applicable requirement at the time of issuance, revision, or reopening, the schedule of compliance shall contain a plan by which the facility will achieve compliance. The plan shall contain deadlines for each item in the plan. The schedule of compliance shall also contain a requirement for submission of progress reports by the facility at least every six months. The progress reports shall contain the dates by which each item in the plan was achieved and an explanation of why any dates in the schedule of compliance were not or will not be met, and any preventive or corrective measures adopted."

Since the District has not determined that the facility is out of compliance with an applicable requirement, the schedule of compliance for this permit contains only sections 2-6-409.10.1 and 2-6-409.10.2.

The BAAQMD Compliance and Enforcement Division has conducted a review of the compliance record for the Metcalf Energy Center, LLC for the period from ???over the past year and has no records of compliance problems at this facility during the past year. The compliance report is contained in Appendix A of this permit evaluation and statement of basis.

VI. Permit Conditions

During the Title V permit development, the District has reviewed the existing permit conditions, deleted the obsolete conditions, and, as appropriate, revised the conditions for clarity and enforceability. Each permit condition is identified with a unique numerical identifier, up to five digits.

When necessary to meet Title V requirements, additional monitoring, recordkeeping, or reporting requirements may be added to the permit. This has not been done for the Metcalf Energy Center, LLC permit.

All changes to existing permit conditions are clearly shown in "strike-out/underline" format in the proposed permit. When the permit is issued, all "strike-out" language will be deleted and all "underline" language will be retained, subject to consideration of comments received.

The existing permit conditions are derived from previously issued District Authorities to Construct (A/C) or Permits to Operate (P/O). Permit conditions may also be imposed or revised as part of the annual review of the facility by the District pursuant to California Health and Safety Code (H&SC) § 42301(e), through a variance pursuant to H&SC § 42350 et seq., an order of abatement pursuant to H&SC § 42450 et seq., or as an administrative revision initiated by District staff. After issuance of the Title V permit, permit conditions will be revised using the procedures in Regulation 2, Rule 6, Major Facility Review.

Conditions that are obsolete or that have no regulatory basis have been deleted from the permit.

Conditions have also been deleted due to the following:

- Redundancy in recordkeeping requirements.
- Redundancy in other conditions, regulations and rules.
- The condition has been superseded by other regulations and rules.
- The equipment has been taken out of service or is exempt.
- The event has already occurred (i.e. initial or start-up source tests).

The regulatory basis is listed following each condition. The regulatory basis may be a rule or regulation. The District is also using the following terms for regulatory basis:

- BACT: This term is used for a condition imposed by the Air Pollution Control Officer (APCO) to ensure compliance with the Best Available Control Technology in Regulation 2-2-301.
- Cumulative Increase: This term is used for a condition imposed by the APCO that limits a source's operation to the operation described in the permit application pursuant to BAAQMD Regulation 2-1-403.
- Offsets: This term is used for a condition imposed by the APCO to ensure compliance with the use of offsets for the permitting of a source or with the banking of emissions from a source pursuant to Regulation 2, Rules 2 and 4.
- PSD: This term is used for a condition imposed by the APCO to ensure compliance with a Prevention of Significant Deterioration permit issued pursuant to Regulation 2, Rule 2.
- TRMP: This term is used for a condition imposed by the APCO to ensure compliance with limits that arise from the District's Toxic Risk Management Policy. This term has been

superseded by BAAQMD Regulation 2, Rule 5 that is based in part upon the provisions of the TRMP.

Changes to Permit Conditions:

As part of the title V permit review process, we have reviewed the permit conditions and their regulatory basis and corrected them if necessary. The following corrections are shown in strikeout/underline in part IV of the permit.

Condition #18310, parts 24(a) and 24(c) for the gas turbines and HRSGs:
The regulatory basis for these conditions will be changed from "CEQA" to "Cumulative Increase". The purpose of these daily mass emission limits is to help enforce the annual emission limits that correspond to the cumulative increase for the facility. CEQA was incorrectly given as the basis and never corrected until now.

Condition #18310, part 27 for the gas turbines and HRSGs:
The basis currently cites "NSPS". This will be corrected to read "40 CFR 60.13" which includes the standards for continuous emission monitors from the general provisions of the New Source Performance Standards. The citation "1-520.1" has been corrected to "1-520.8". District Regulation 1, section 520.1 does not apply to the HRSGs at the Metcalf Energy Center since they have a rated heat input of 200 MM BTU/hr. Instead, Regulation 1, Section 520.8 applies since the continuous emission monitors in use at MEC were required by the District through Regulation 2-1-403.

Condition #21917 for the S-7 Fire Pump Diesel Engine:
These conditions will be replaced by standard conditions that are routinely applied by the District to diesel engines that are subject to the state ATCM for stationary diesel engines.

VII. Applicable Limits and Compliance Monitoring Requirements

This section of the permit is a summary of numerical limits and related monitoring requirements for each source. The summary includes a citation for each monitoring requirement, frequency of monitoring, and type of monitoring. The applicable requirements for monitoring are completely contained in Sections IV, Source-Specific Applicable Requirements, and VI, Permit Conditions, of the permit.

The District has reviewed all monitoring and has determined the existing monitoring is adequate with the following exceptions.

The tables below contain only the limits for which there is no monitoring or inadequate monitoring in the applicable requirements. The District has examined the monitoring for other limits and has determined that monitoring is adequate to provide a reasonable assurance of compliance. Calculations for potential to emit will be provided in the discussion when no monitoring is proposed due to the size of a source.

Monitoring decisions are typically the result of a balancing of several different factors including: 1) the likelihood of a violation given the characteristics of normal operation, 2) degree of variability in the operation and in the control device, if there is one, 3) the potential severity of

impact of an undetected violation, 4) the technical feasibility and probative value of indicator monitoring, 5) the economic feasibility of indicator monitoring, and 6) whether there is some other factor, such as a different regulatory restriction applicable to the same operation, that also provides some assurance of compliance with the limit in question.

These factors are the same as those historically applied by the District in developing monitoring for applicable requirements**.** It follows that, although Title V calls for a re-examination of all monitoring**,** there is a presumption that these factors have been appropriately balanced and incorporated in the District's prior rule development and/or permit issuance. It is possible that, where a rule or permit requirement has historically had no monitoring associated with it, no monitoring may still be appropriate in the Title V permit if, for instance, there is little likelihood of a violation**.** Compliance behavior and associated costs of compliance are determined in part by the frequency and nature of associated monitoring requirements. As a result, the District will generally revise the nature or frequency of monitoring requirements only when it can support a conclusion that existing monitoring is inadequate for the purpose of determining compliance with the applicable requirement.

SO_2 Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-1 Gas Turbine #1, S-2 Heat Recovery Steam Generator #1, S-3 Gas Turbine #2, S-4 Heat Recovery Steam Generator #2, S-6 Standby Generator, S-7 Fire Pump Diesel Engine	BAAQMD 9-1-301	Ground level concentrations of SO2 shall not exceed: 0.5 ppm for 3 consecutive minutes AND 0.25 ppm averaged over 60 consecutive minutes AND 0.05 ppm averaged over 24 hours	None
S-1 Gas Turbine #1, S-2 Heat Recovery Steam Generator #1, S-3 Gas Turbine #2, S-4 Heat Recovery Steam Generator #2, S-6 Standby Generator	BAAQMD 9-1-302	300 ppm (dry)	None
S-7 Fire Pump Diesel Engine	BAAQMD 9-1-304	Sulfur content of fuel < 0.5% by weight	None

SO2 Discussion:

BAAQMD Regulation 9-1-301

Area monitoring to demonstrate compliance with the ground level SO_2 concentration requirements of Regulation 9-1-301 is at the discretion of the APCO pursuant to BAAQMD Regulation 9-1-501. The primary sources of SO2 at the MEC are the gas turbines and heat recovery steam generators. These sources emit SO2 at low concentrations through 120-foot tall stacks. Therefore, it is unlikely that it will cause or contribute to ground level SO_2 concentrations in excess of the limits specified in Regulation 9-1-301. Therefore, no monitoring is necessary for this emission limit.

BAAQMD Regulation 9-1-302

All facility combustion sources are subject to the SO_2 emission limitations in District Regulation 9, Rule 1 (ground-level concentration and emission point concentration). In EPA's June 24, 1999 agreement with the California Air Pollution Control Officers Association (CAPCOA) and the California Air Resources Board (ARB) entitled, "Periodic Monitoring Recommendations for Generally Applicable Requirements in SIP," EPA has agreed that natural-gas-fired combustion sources do not need additional monitoring to verify compliance with Regulation 9, Rule 1, since violations of the regulation are unlikely. Sources S-1, S-2, S-3, S-4, and S-6 are fired exclusively on natural gas and therefore fall within this category.

S-7, the Fire Pump Diesel Engine is not subject to Regulation 9-1-302 because it is fired on liquid fuel and is therefore subject to Regulation 9-1-304.

BAAQMD Regulation 9-1-304

S-7, the Fire Pump Diesel Engine, will be fired on California-spec ultra low sulfur diesel fuel with a maximum sulfur content of 15 ppmw, which is equal to 0.0015% by weight. Therefore, S-7 will not violate the fuel sulfur content limit of 0.5% by weight.

PM Discussion:

PM Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-1 Gas Turbine #1, S-2 Heat Recovery Steam Generator #1, S-3 Gas Turbine #2, S-4 Heat Recovery Steam Generator #2, S-5 Cooling Tower, S-6 Standby Generator, S-7 Fire Pump Diesel Engine	Regulation 6-1-301 and SIP Regulation 6-301	Ringelmann 1.0	None

PM Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-5 Cooling Tower	Regulation 6-1-310 and SIP Regulation 6-310	0.15 gr/dscf	None
S-1 Gas Turbine #1, S-2 Heat Recovery Steam Generator #1, S-3 Gas Turbine #2, S-4 Heat Recovery Steam Generator #2, S-6 Standby Generator, S-7 Fire Pump Diesel Engine	Regulation 6-1-310.3 and SIP Regulation 6-310.3	0.15 gr/dscf at 6% O2	None

PM Discussion:

BAAQMD Regulation 6, Rule 1 "Particulate Matter, General Requirements" and SIP Regulation 6 "Particulate Matter and Visible Emissions"

Visible Emissions

BAAQMD Regulation 6-1-301 limits visible emissions to no darker than 1.0 on the Ringelmann Chart (except for periods or aggregate periods less than 3 minutes in any hour). Visible emissions are normally not associated with combustion of gaseous fuels, such as natural gas. Sources S-1, S-2, S-3, S-4 and S-6 burn exclusively natural gas, therefore, per the EPA's June 24, 1999 agreement with CAPCOA and ARB titled "Summary of Periodic Monitoring Recommendations for Generally Applicable Requirements in SIP", no monitoring is required to assure compliance with this limit for these sources.

The S-7 Fire Pump Diesel Engine model has been certified by the California Air Resources Board at a particulate emission rate of 0.24 g/kw-hr. Using the engine specifications, this equals (0.24 g/kw-hr)(268.6 kw)(lb/450 g) = 0.14 lb/hr. Diesel fuel sulfur content has been identified as a major contributor to diesel particulate matter emissions. Because the S-7 Fire Pump Diesel Engine is fired exclusively on California ultra low sulfur diesel fuel with a maximum sulfur content of 0.0015% by weight, a violation of the visible emissions limit of Ringelmann No. 1 is not expected[NW1]. The fire pump's infrequent operation (during emergencies only and for a maximum of 30 hours per year for reliability-related activities) further supports the District's conclusion that additional monitoring is not warranted to insure compliance with this regulation.

Particulate Weight Limitation

BAAQMD Regulation 6-1-310 limits filterable particulate (FP) emissions from any source to 0.15 grains per dry standard cubic foot (gr/dscf) of exhaust volume. Section

310.3 limits filterable particulate emissions from "heat transfer operations" to 0.15 gr/dscf @ 6% O_2. These are referred to as "grain loading" standards.

Exceedances of the grain loading standards are normally not associated with combustion of gaseous fuels, such as natural gas. Sources S-1, S-2, S-3, S-4 and S-6 burn natural gas exclusively, therefore, per the EPA's July 2001 agreement with CAPCOA and ARB entitled "CAPCOA/CARB/EPA Region IX Recommended Periodic Monitoring for Generally Applicable Grain Loading Standards in the SIP: Combustion Sources: Summary of Periodic Monitoring Recommendations for Generally Applicable Requirements in SIP", no monitoring is required to assure compliance with this limit for these sources.

Because S-7, the Fire Pump Diesel Engine, is fired exclusively on diesel fuel with a maximum sulfur content of 0.0015% by weight, a violation of the particulate weight limitation of Regulation 6-310.3 is not expected. The fire pump's infrequent operation (during emergencies only and for a maximum of 30 hours per year for reliability-related activities) further supports the District's conclusion that additional monitoring is not warranted to insure compliance with this regulation.

Emission Calculations:

Regulation 6-1-310.3 allows 0.15 grains PM/dscf @ 6% O_2. As shown below, combined gas turbine (CTG) and HRSG emissions are expected to be well below the limit (at approximately 0.04 gr/dscf @ 6% O_2). Accordingly, monitoring is not warranted to insure compliance by the CTGs and HRSGs with this regulation.

S-1 & S-3 Gas Turbines and S-2 & S-4 HRSG Duct Burners

Gas Turbine Emissions:

The gas turbines are limited by permit condition to a PM10 emission rate of 9 lb/hr. Source testing has shown that the gas turbines have met this limit by a comfortable margin. Therefore, the following calculation is conservative.

The corresponding PM_{10} emission factor is therefore:

(9 lb PM_{10}/hr)/(1,990.5 MM BTU/hr) = **0.00452 lb PM_{10}/MM BTU**

The following stack data will be used to calculate the grain loading at standard conditions for full load gas turbine operation without duct burner firing to determine compliance with BAAQMD Regulation 6-310.3.

PM_{10} mass emission rate:	9 lb/hr
flow rate:	953,965 acfm @ 12.24% O_2 and 170^{o}F
moisture content:	10.17% by volume

Converting flow rate to standard conditions:

(953,965 acfm)(70 + 460 ^{o}R/170 + 460 ^{o}R)(1 – 0.1017) = 720,923 dscfm

Converting to grains/dscf:

(9 lb PM_{10}/hr)(1 hr/60 min)(7000 gr/lb)/(720,923 dscfm) = 0.00146 gr/dscf

Converting to 6% O_2 basis:

(0.00146 gr/dscf)[(20.95 - 6)/(20.95 – 12.24)] = 0.0025 gr/dscf @ 6% O_2

Gas Turbine and HRSG Combined Emissions:

The PM_{10} emission factor is based upon the Westinghouse vendor guarantee of 12 lb/hr at the maximum combined firing rate of 2,124 MM BTU/hr during duct burner firing and steam injection power augmentation. Each gas turbine and HRSG pair is limited by permit condition to the PM10 emission rate of 12 lb/hr.

The corresponding PM_{10} emission factor is therefore:

(12 lb PM_{10}/hr)/(2,124 MM BTU/hr) = **0.00565 lb PM_{10}/MM BTU**

The following stack data will be used to calculate the grain loading for simultaneous CTG and HRSG operation at standard conditions to determine compliance with BAAQMD Regulation 6-310.3.

PM_{10} mass emission rate:	12 lb/hr
typical flow rate:	956,141 acfm @ 10.28% O_2 and 170^{o}F
typical moisture content:	15.03% by volume

Converting flow rate to standard conditions:

(956,141 acfm)(70 + 460 ^{o}R/170 + 460 ^{o}R)(1 - 0.1503) = 683,475 dscfm

Converting to grains/dscf:

(12 lb PM_{10}/hr)(1 hr/60 min)(7000 gr/lb)/(683,475 dscfm) = 0.002 gr/dscf

Converting to 6% O_2 basis:

(0.002 gr/dscf)[(20.95 - 6)/(20.95 – 15.03)] = 0.04 gr/dscf @ 6% O_2

VIII. Test Methods

This section of the permit lists test methods that are associated with standards in District or other rules. It is included only for reference. In most cases, the test methods in the rules are source test methods that can be used to determine compliance but are not required on an ongoing basis. They are not "applicable requirements" as defined by Regulation 2-6-202.

If a rule or permit condition requires ongoing testing, the requirement will also appear in Section IV of the permit.

IX. Title IV Acid Rain Permit

The Metcalf Energy Center (MEC) is subject to the Acid Rain Permit requirements of 40 CFR Part 72 because it is a utility unit as defined by 40 CFR 72.5. The MEC is a Phase II Acid Rain Facility pursuant to Regulation 2, Rule 6, Section 217. Pursuant to 40 CFR 72.9(c)(i), the MEC must hold SO2 allowances for each emission unit in an amount not less than the total annual SO2 emissions from the unit for the previous calendar year.

The Acid Rain permit for the Metcalf Energy Center is contained in section IX of the Title V permit. The Acid Rain Permit Application is attached to the permit as Appendix A.

X. Permit Shield

The District rules allow two types of permit shields. The permit shield types are defined as follows: (1) A provision in a major facility review permit explaining that specific federally enforceable regulations and standards do not apply to a source or group of sources, or (2) A provision in a major facility review permit explaining that specific federally enforceable applicable requirements for monitoring, recordkeeping and/or reporting are subsumed because other applicable requirements for monitoring, recordkeeping, and reporting in the permit will assure compliance with all emission limits.

The second type of permit shield is allowed by EPA's "White Paper 2 for Improved Implementation of the Part 70 Operating Permits Program." The District uses the second type of permit shield for all streamlining of monitoring, recordkeeping, and reporting requirements in Title V permits. The District's program does not allow other types of streamlining in Title V permits. Streamlining is the practice of employing the most stringent monitoring, recordkeeping, or reporting requirement when multiple requirements apply to a given source.

This facility has no permit shields.

This permit has no streamlining.

XI. Glossary

D. Alternate Operating Scenarios:

No alternate operating scenario has been requested for this facility.

E. Compliance Status:

Will complete upon receipt of new compliance report from Enforcement. The current report was issued on December 5, 2008 and is stale

A _____ office memorandum from the Director of Compliance and Enforcement, to the Director of Permit Services, presents a review of the compliance record of _____ (Site #: _____). The Compliance and Enforcement Division staff has reviewed the records for _____ for the period between _____ through _____. This review was initiated as part of the District evaluation of an application by _____for a Title V permit. During the period subject to review, activities known to the District include:

- There were no Notices of Violation issued during this review period.
- The District did not receive any alleged complaints.
- The facility is not operating under a Variance or an Order of Abatement from the District Board.
- There were no monitor excesses or equipment breakdowns reported or documented by District staff.

The owner certified that all equipment was operating in compliance on October 24, 1995. No non-compliance issues have been identified to date.

F. Differences between the Application and the Proposed Permit:

The Title V permit application was submitted on May 11, 2001. [NW2] The facility commenced operation in April 2005. The following applications have been processed since this Title V application was submitted. The proposed permit reflects the changes resulting from these applications. The evaluation reports are attached to this document as Appendix C.

Application 2596
Submitted: 4/2/01 Authority to Construct granted: 2/13/02
This application was for an authority to construct and permit to operate for the S-5 Cooling Tower. As originally proposed, the cooling tower was exempt from District permit requirements. However, the cooling tower lost its exemption after Regulation 2, Rule 1 was amended on May 17, 2000.

Application 4789
Submitted: 4/2/02 Authority to Construct granted: 9/10/02

This application was for an authority to construct for oxidation catalysts that the applicant agreed to install at the request of the CEC during the licensing process.

Application 11251
Submitted: 11/18/04 Authority to Construct granted: 4/11/05

This application was for a change of permit conditions governing the gas turbines. The changes included a revised definition of gas turbine start-ups, revised start-up emission rates, allowances for combustor tuning, revised commissioning emission rates, and increased submittal times for source test reports.

Application 12560
Submitted: 5/3/05 Authority to Construct granted: 6/2/05

This application was for an authority to construct for S-6 Standby Generator Set, Natural Gas fired and S-7 Fire Pump Diesel Engine. The permit to operate for S-6 Standby Generator Set was issued on June 13, 2005. The permit to operate for S-7 Fire Pump Diesel Engine was issued on October 29, 2008.

Application 16512
Submitted: 7/30/07 Permit to Operate Issued: 4/14/08

This application was for a change of permit conditions for the S-5 Cooling Tower to allow an increase in circulation rate from 8 million gallons per hour to 9 million gallons per hour.

APPENDIX A

BAAQMD COMPLIANCE REPORT

COMPLIANCE & ENFORCEMENT DIVISION

Inter-Office Memorandum

March 14, 2011

TO: BRIAN BATEMAN – DIRECTOR OF ENGINEERING

FROM: KELLY WEE – DIRECTOR OF ENFORCEMENT

SUBJECT: REVIEW OF COMPLIANCE RECORD OF:

CALPINE - METCALF ENERGY CENTER: SITE # B2183

Background

This review was initiated as part of the District evaluation of an application by METCALF ENERGY CENTER for a Title V permit renewal. It is standard practice of the Compliance and Enforcement Division to undertake a compliance record review in advance of a renewal of a Title V Permit to Operate. The purpose of this review is to assure that any non-compliance problems identified during the review period have been adequately addressed, or, if non-compliance persists, that a schedule of compliance is properly incorporated into the Title V permit compliance schedule. In addition, the review checks for patterns of recurring violation that may be addressed by additional permit terms. Finally, the review is intended to recommend, if necessary, any additional permit conditions and limitations to improve compliance.

Compliance Review

METCALF ENERGY CENTER began operation in May of 2005. In preparing for the report, District Staff conducted a full compliance inspection in September 2007 and found no compliance issues at that time.

Staff also reviewed the District compliance record for METCALF ENERGY CENTER for October 2007, through January 2011. During this period review, METCALF ENERGY CENTER'S compliance activities known to the District include:

> The District issued two (2) Notices of Violation in July of 2008, both citing Regulation 2-6-307 for non-compliance with a federally enforceable permit condition (ammonia slip limitation). The violations occurred on February 14 and 15, 2008, and were isolated incidents. The facility demonstrated a return to compliance with the permit condition as of March 21, 2008.

The District issued one (1) Notice of Violation in May of 2010, citing Regulation 2-6-426.2 for failure to submit Annual Compliance Certifications for years 2002 through 2009. Although METCALF ENERGY CENTER has not received their final Title V permit, they are still required to submit an Annual Compliance Certification Report as required in Regulation 2-6-426.2. It was discovered In February of 2010, that METCALF ENERGY CENTER had not submitted any Compliance Certification Report since it began its operation in May of 2005. METCALF ENERGY CENTER submitted all of the required Annual Compliance Certification Report and came into compliance with this requirement on January 7, 2011.

The District received two (2) air pollution complaints alleging METCALF ENERGY CENTER as the source, both "unconfirmed".

The District received five (5) notifications for Reportable Compliance Activities reports from the facility, both involving unforeseeable equipment failures for which the District granted breakdown relief under Regulation 1-208.

There are NO enforcement agreements, open variances, or open abatement orders for METCALF ENERGY CENTER.

Conclusion

The Compliance and Enforcement Division has made a determination that for the review period September 2007 through January 7, 2011, METCALF ENERGY CENTER was in intermittent compliance. There is no evidence of on-going non-compliance and no recurring pattern of violations that would warrant consideration of a Title V permit compliance schedule.

APPENDIX B

GLOSSARY

ACT
Federal Clean Air Act

APCO
Air Pollution Control Officer

ARB
Air Resources Board

BAAQMD
Bay Area Air Quality Management District

BACT
Best Available Control Technology

Basis
The underlying authority which allows the District to impose requirements.

CAA
The federal Clean Air Act

CAAQS
California Ambient Air Quality Standards

CAM
Compliance Assurance Monitoring per 40 CFR Part 64

CAPCOA
California Air Pollution Control Officers Association

CEM
Continuous Emission Monitor

CEQA
California Environmental Quality Act

CFR
The Code of Federal Regulations. 40 CFR contains the implementing regulations for federal environmental statutes such as the Clean Air Act. Parts 50-99 of 40 CFR contain the requirements for air pollution programs.

CO
Carbon Monoxide

Cumulative Increase
The sum of permitted emissions from each new or modified source since a specified date pursuant to BAAQMD Rule 2-1-403, Permit Conditions (as amended by the District Board on 7/17/91) and SIP Rule 2-1-403, Permit Conditions (as approved by EPA on 6/23/95). Cumulative increase is used to determine whether threshold-based requirements are triggered.

District

The Bay Area Air Quality Management District

EPA
The federal Environmental Protection Agency.

Excluded
Not subject to any District regulations.

Federally Enforceable, FE
All limitations and conditions which are enforceable by the Administrator of the EPA including those requirements developed pursuant to 40 CFR Part 51, subpart I (NSR), Part 52.21 (PSD), Part 60 (NSPS), Part 61 (NESHAPs), Part 63 (MACT), and Part 72 (Permits Regulation, Acid Rain), including limitations and conditions contained in operating permits issued under an EPA-approved program that has been incorporated into the SIP.

FP
Filterable Particulate as measured by BAAQMD Method ST-15, Particulate.

HAP
Hazardous Air Pollutant. Any pollutant listed pursuant to Section 112(b) of the Act. Also refers to the program mandated by Title I, Section 112, of the Act and implemented by 40 CFR Part 63.

Major Facility
A facility with potential emissions of: (1) at least 100 tons per year of regulated air pollutants, (2) at least 10 tons per year of any single hazardous air pollutant, and/or (3) at least 25 tons per year of any combination of hazardous air pollutants, or such lesser quantity of hazardous air pollutants as determined by the EPA administrator.

MFR
Major Facility Review. The District's term for the federal operating permit program mandated by Title V of the Federal Clean Air Act and implemented by District Regulation 2, Rule 6.

MOP
The District's Manual of Procedures.

NAAQS
National Ambient Air Quality Standards

NESHAPS
National Emission Standards for Hazardous Air Pollutants. See in 40 CFR Parts 61 and 63.

NMHC
Non-methane Hydrocarbons (Same as NMOC)

NMOC
Non-methane Organic Compounds (Same as NMHC)

NOx
Oxides of nitrogen.

NSPS
Standards of Performance for New Stationary Sources. Federal standards for emissions from new stationary sources. Mandated by Title I, Section 111 of the Federal Clean Air Act, and implemented by 40 CFR Part 60 and District Regulation 10.

NSR
New Source Review. A federal program for pre-construction review and permitting of new and modified sources of pollutants for which criteria have been established in accordance with Section 108 of the Federal Clean Air Act. Mandated by Title I of the Federal Clean Air Act and implemented by 40 CFR Parts 51 and 52 and District Regulation 2, Rule 2. (Note: There are additional NSR requirements mandated by the California Clean Air Act.)

Offset Requirement
A New Source Review requirement to provide federally enforceable emission offsets for the emissions from a new or modified source. Applies to emissions of POC, NOx, PM10, and SO2.

Phase II Acid Rain Facility
A facility that generates electricity for sale through fossil-fuel combustion and is not exempted by 40 CFR 72 from Titles IV and V of the Clean Air Act.

POC
Precursor Organic Compounds

PM
Particulate Matter

PM10
Particulate matter with aerodynamic equivalent diameter of less than or equal to 10 microns

PSD
Prevention of Significant Deterioration. A federal program for permitting new and modified sources of those air pollutants for which the District is classified "attainment" of the National Air Ambient Quality Standards. Mandated by Title I of the Act and implemented by both 40 CFR Part 52 and District Regulation 2, Rule 2.

PTE
Potential to Emit as defined by BAAQMD Regulation 2-6-218

SIP
State Implementation Plan. State and District programs and regulations approved by EPA and developed in order to attain the National Air Ambient Quality Standards. Mandated by Title I of the Act.

SO2
Sulfur dioxide

THC
Total Hydrocarbons (NMHC + Methane)

Title V

Title V of the federal Clean Air Act. Requires a federally enforceable operating permit program for major and certain other facilities.

TOC
Total Organic Compounds (NMOC + Methane, Same as THC)

TPH
Total Petroleum Hydrocarbons

TRMP
Toxic Risk Management Plan

TSP
Total Suspended Particulate

VOC
Volatile Organic Compounds

Units of Measure:

bhp	=	brake-horsepower
btu	=	British Thermal Unit
cu. ft.	=	cubic foot
cfm	=	cubic feet per minute
dscf	=	dry standard cubic foot
dscfm	=	dry standard cubic foot per minute
g	=	gram
gal	=	gallon
gpm	=	gallons per minute
gr	=	grain
hp	=	horsepower
hr	=	hour
lb	=	pound
in	=	inch
max	=	maximum
m^2	=	square meter
min	=	minute
mm	=	million
MMbtu	=	million btu
MMcf	=	million cubic feet
ppmv	=	parts per million, by volume
ppmw	=	parts per million, by weight
psia	=	pounds per square inch, absolute
psig	=	pounds per square inch, gauge
scfm	=	standard cubic feet per minute
tpy	=	tons per year
yr	=	year

APPENDIX C

Permit Evaluation Reports

Application 4789
9/5/02

Metcalf Energy Center; Plant #12183
Monterey Road & Santa Theresa Blvd, San Jose CA 95123

BACKGROUND

Metcalf Energy Center is applying for an Authority to Construct two Oxidation Catalysts that will abate CO and TAC emissions from the following equipment:

S-1 Gas Turbine #1, abated by A-3 Oxidation Catalyst
S-2 HRSG #1, abated by A-3 Oxidation Catalyst
S-3 Gas Turbine #2, abated by A-4 Oxidation Catalyst
S-4 HRSG #2, abated by A-4 Oxidation Catalyst

As originally designed and proposed, the Metcalf Energy Center was not equipped with oxidation catalysts. However, the California Energy Commission has required that catalysts be installed to respond to the public's concerns about toxic air contaminant emissions during gas turbine start-ups. Because Calpine does not feel that the catalysts will achieve significant and consistent reductions in TAC or VOC emissions, they are not requesting any reductions in facility emission rates for those compounds. In addition, Calpine is not requesting any changes to the CO emission limitations.

CRITERIA-POLLUTANT EMISSION SUMMARY

Annual Average Project Emissions Increase:

Pollutant	lb/day	ton/yr
POC	0	0
NO_x	0	0
SO_2	0	0
CO	0	0
PM_{10}	0	0
NPOC	0	0

EMISSION CALCULATIONS

There will no increase in toxic air contaminant or regulated air pollutant emissions as a result of the installation of the A-3 and A-4 Oxidation Catalysts.

FACILITY CUMULATIVE INCREASE
(since April 5, 1991)

This section does not apply since there will no increase in regulated air pollutant emissions as a result of the installation of the A-3 and A-4 Oxidation Catalysts.

TOXIC RISK SCREENING ANALYSIS

This section does not apply since there will no change in the type of toxic air contaminant emissions or increase in toxic air contaminant emissions as a result of the installation of the A-3 and A-4 Oxidation Catalysts.

BACT ANALYSIS

All of the gas turbines and HRSGs triggered BACT when originally permitted under application 27215. The BACT analysis is not changed by the installation of the proposed A-3 and A-4 Oxidation Catalysts.

OFFSET ANALYSIS

These requirements do not apply since there will no increase in regulated air pollutant emissions as a result of the installation of the A-3 and A-4 Oxidation Catalysts.

FEE SUMMARY

Source	Fee Schedule	Filing Fee	Initial Fee	Late Fee	Permit to Operate Fee	Source Sub-Total
S-1 Gas Turbine #1	B	$238.00	$29,230.00	$0.00	$0.00	$29,468.00
S-3 Gas Turbine #2	B	$238.00	$29,230.00	$0.00	$0.00	$29,468.00
					Grand Total	**$58,936.00**
					Amount Paid	**$58,936.00**
					Log Number	**H339K**

STATEMENT OF COMPLIANCE

S-1 Gas Turbine #1, S-2 HRSG #1, S-3 Gas Turbine #2, and S-4 HRSG #2 are expected to continue to comply with all applicable regulations after the proposed A-3 and A-4 Oxidation Catalysts are installed. The applicable regulations are described in the FDOC for the Metcalf Energy Center which was issued under application 27215.

A Toxics Risk Screening Analysis is not required due to installation of the proposed A-3 and A-4 Oxidation Catalysts since there will no change in the type of toxic air contaminant emissions or increase in toxic air contaminant emissions. TBACT does not apply to this project.

BACT, Offsets, PSD, NSPS, and NESHAPS do not apply to this project.

PERMIT CONDITIONS

Condition #18310 will be modified as shown below to reflect the addition of the oxidation catalysts:

The following changes are for the purposes of Title IV/V.

- "Part" has been substituted for "condition" throughout.
- Part 13: a sulfur content limit has been included to satisfy federal acid rain requirements

Definitions:

Clock Hour:	Any continuous 60-minute period beginning on the hour.
Calendar Day:	Any continuous 24-hour period beginning at 12:00 AM or 0000 hours.
Year:	Any consecutive twelve-month period of time
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in BTU/scf.
Rolling 3-hour period:	Any three-hour period that begins on the hour and does not include start-up or shutdown periods.
Firing Hours:	Period of time during which fuel is flowing to a unit, measured in fifteen-minute increments.
MM BTU:	million British thermal units
Gas Turbine Start-up Mode:	The lesser of the first 180 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of ~~condition~~parts 20(b) and 20(d).
Gas Turbine Shutdown Mode:	The lesser of the 30-minute period immediately prior to the termination of fuel flow to the Gas Turbine or the period of time from non-compliance with any requirement listed in ~~Condition~~Parts 20(b) through 20(d) until termination of fuel flow to the Gas Turbine.
Specified PAHs:	The polycyclic aromatic hydrocarbons listed below shall be considered to Specified PAHs for these permit conditions. Any emission limits for Specified PAHs refer to the sum of the emissions for all six of the following compounds. Benzo[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Dibenzo[a,h]anthracene Indeno[1,2,3-cd]pyrene
Corrected Concentration:	The concentration of any pollutant (generally NO_x, CO, or NH_3) corrected to a standard stack gas oxygen concentration. For

emission point P-1 (combined exhaust of S-1 Gas Turbine and S-2 HRSG duct burners) and emission point P-2 (combined exhaust of

	S-3 Gas Turbine and S-4 HRSG duct burners) the standard stack gas oxygen concentration is 15% O_2 by volume on a dry basis.
Commissioning Activities:	All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the MEC construction contractor to insure safe and reliable steady state operation of the gas turbines, heat recovery steam generators, steam turbine, and associated electrical delivery systems.
Commissioning Period:	The Period shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed, or when a gas turbine is first fired, whichever occurs first. The period shall terminate when the plant has completed performance testing, is available for commercial operation, and has initiated sales to the power exchange. The commissioning period shall not exceed 180 days under any circumstances.
Precursor Organic Compounds (POCs):	Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate
CEC CPM:	California Energy Commission Compliance Program Manager
MEC:	Metcalf Energy Center

Conditions for the Commissioning Period

1. The owner/operator of the Metcalf Energy Center (MEC) shall minimize emissions of carbon monoxide and nitrogen oxides from S-1 and S-3 Gas Turbines and S-2 and S-4 Heat Recovery Steam Generators (HRSGs) to the maximum extent possible during the commissioning period. ~~Condition~~Parts 1 through 12 shall only apply during the commissioning period as defined above. Unless otherwise indicated, ~~Condition~~Parts 13 through 47 shall apply after the commissioning period has ended. (PSD for NOx and CO)

2. At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the S-1 & S-3 Gas Turbine combustors and S-2 & S-4 Heat Recovery Steam Generator duct burners shall be tuned to minimize the emissions of carbon monoxide and nitrogen oxides. (PSD for CO and NOx)

3. At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the A-1 and A-2 SCR Systems and A-3 and A-4 Oxidation Catalysts shall be installed, adjusted, and operated to minimize the emissions of carbon monoxide and nitrogen oxides from S-1 & S-3 Gas Turbines and S-2 & S-4 Heat Recovery Steam Generators. (PSD for CO and NOx)

4. Coincident with the steady-state operation of A-1 & A-2 SCR Systems and A-3 & A-4 Oxidation Catalysts pursuant to ~~condition~~parts 3, 10, 11, and 12, the Gas Turbines (S-1 & S-3) and the HRSGs (S-2 & S-4) shall comply with the NO_x and CO emission limitations specified in ~~condition~~parts 20(a) through 20(d). (BACT, Offsets)

5. The owner/operator of the MEC shall submit a plan to the District Permit Services Division and the CEC CPM at least four weeks prior to first firing of S-1 or S-3 Gas Turbines describing the procedures to be followed during the commissioning of the turbines, HRSGs, and steam turbine. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the Dry-Low-NO_x combustors, the installation and operation of the required emission control systems, the installation, calibration, and testing of the CO and NO_x continuous emission monitors, and any activities requiring the firing of the Gas Turbines (S-1 & S-3) and HRSGs (S-2 & S-4) without abatement by their respective SCR Systems. Neither Gas Turbine (S-1 or S-3) shall be fired sooner than 28 days after the District receives the commissioning plan. (PSD for NOx and CO)

6. During the commissioning period, the owner/operator of the MEC shall demonstrate compliance with ~~condition~~parts 8 through 10 through the use of properly operated and maintained continuous emission monitors and data recorders for the following parameters:

   firing hours
   fuel flow rates
   stack gas nitrogen oxide emission concentrations,
   stack gas carbon monoxide emission concentrations
   stack gas oxygen concentrations.

   The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the Gas Turbines (S-1 & S-3) and HRSGs (S-2 & S-4). The owner/operator shall use District-approved methods to calculate heat input rates, nitrogen dioxide mass emission rates, carbon monoxide mass emission rates, and NO_x and CO emission concentrations, summarized for each clock hour and each calendar day. All records shall be retained on site for at least 5 years from the date of entry and made available to District personnel upon request. (9-9-501, BACT, Offsets)

7. The District-approved continuous monitors specified in ~~condition~~part 6 shall be installed, calibrated, and operational prior to first firing of the Gas Turbines (S-1 & S-3) and Heat Recovery Steam Generators (S-2 & S-4). After first firing of the turbines, the detection range of these continuous emission monitors shall be adjusted as necessary to accurately measure the resulting range of CO and NO_x emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval. (9-9-501, BACT, Offsets)

8. The total number of firing hours of S-1 Gas Turbine and S-2 Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-1 SCR System and/or without abatement of carbon monoxide emissions by A-3 Oxidation Catalyst shall not exceed 300 hours during the commissioning period. Such operation of S-1 Gas Turbine and S-2 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services

and Enforcement Divisions and the unused balance of the 300 firing hours without abatement shall expire. (Offsets)

9. The total number of firing hours of S-3 Gas Turbine and S-4 Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-3 SCR System and/or without abatement of carbon monoxide emissions by A-4 Oxidation Catalyst shall not exceed 300 hours during the commissioning period. Such operation of S-3 Gas Turbine and S-4 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 300 firing hours without abatement shall expire. (Offsets)

10. The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM_{10}, and sulfur dioxide that are emitted by the Gas Turbines (S-1 & S-3) and Heat Recovery Steam Generators (S-2 & S-4) during the commissioning period shall accrue towards the consecutive twelve-month emission limitations specified in ~~condition~~part 25, except that total, cumulative NO_x mass emissions from S-1, S-2, S-3, and S-4 shall not exceed 185 tons during any consecutive twelve-month period which includes a portion of the Commissioning Period. (Offsets)

11. Combined pollutant mass emissions from the Gas Turbines (S-1 & S-3) and Heat Recovery Steam Generators (S-2 & S-4) shall not exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the Gas Turbines (S-1 & S-3).

NO_x (as NO_2)	4805 pounds per calendar day	381.2 pounds per hour
CO	11,498 pounds per calendar day	930 pounds per hour
POC (as CH_4)	495 pounds per calendar day	
PM_{10}	468 pounds per calendar day	
SO_2	42 pounds per calendar day	

(PSD for NOx and CO)

12. Prior to the end of the Commissioning Period and not later than 120 days after commencement of the commissioning period, the Owner/Operator shall conduct a District and CEC approved source test using external continuous emission monitors to determine compliance with ~~condition~~part 21. The source test shall determine NO_x, CO, and POC emissions during start-up and shutdown of the gas turbines. The POC emissions shall be analyzed for methane and ethane to account for the presence of unburned natural gas. The source test shall include a minimum of three start-up and three shutdown periods. Twenty working days before the execution of the source tests, the Owner/Operator shall submit to the District and the CEC Compliance Program Manager (CPM) a detailed source test plan designed to satisfy the requirements of this condition. The District and the CEC CPM will notify the Owner/Operator of any necessary modifications to the plan within 20 working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CEC CPM comments into the test plan. The Owner/Operator shall notify the District and the CEC CPM within seven (7) working days

prior to the planned source testing date. Source test results shall be submitted to the District and the CEC CPM within 30 days of the source testing date. (PSD for NOx and CO, offsets)

Conditions for the Gas Turbines (S-1 & S-3) and the Heat Recovery Steam Generators (HRSGs; S-2 & S-4)

13. The Gas Turbines (S-1 and S-3) and HRSG Duct Burners (S-2 and S-4) shall be fired exclusively on natural gas with a maximum sulfur content of 1 grain per 100 standard cubic feet. (BACT for SO_2 and PM_{10})

14. The combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4) shall not exceed 2,124 MM BTU (HHV) per hour, averaged over any rolling 3-hour period. (PSD for NO_x)

15. The combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4) shall not exceed 49,908 MM BTU (HHV) per calendar day. (PSD for PM_{10})

~~16. The combined cumulative heat input rate for the Gas Turbines (S-1 & S-3) and the HRSGs (S-2 & S-4) shall not exceed 35,274,060 MM BTU (HHV) per year. (Offsets)~~

17. The HRSG duct burners (S-2 and S-4) shall not be fired unless its associated Gas Turbine (S-1 and S-3, respectively) is in operation. (BACT for NO_x)

18. S-1 Gas Turbine and S-2 HRSG shall be abated by the properly operated and properly maintained A-1 Selective Catalytic Reduction (SCR) System and A-3 Oxidation Catalyst whenever fuel is combusted at those sources and the A-1 catalyst bed has reached minimum operating temperature. (BACT for NO_x)

19. S-3 Gas Turbine and S-4 HRSG shall be abated by the properly operated and properly maintained A-2 Selective Catalytic Reduction (SCR) System and A-4 Oxidation Catalyst whenever fuel is combusted at those sources and the A-2 catalyst bed has reached minimum operating temperature. (BACT for NO_x)

20. The Gas Turbines (S-1 & S-3) and HRSGs (S-2 & S-4) shall comply with requirements (a) through (h) under all operating scenarios, including duct burner firing mode and steam injection power augmentation mode. Requirements (a) through (h) do not apply during a gas turbine start-up or shutdown. (BACT, PSD, Toxic Risk Management Policy)

    (a) Nitrogen oxide mass emissions (calculated as NO_2) at P-1 (the combined exhaust point for the S-1 Gas Turbine and the S-2 HRSG after abatement by A-1 SCR System) shall not exceed 19.2 pounds per hour or 0.00904 lb/MM BTU (HHV) of natural gas fired. Nitrogen oxide mass emissions (calculated as NO_2) at P-2 (the combined exhaust point for the S-3 Gas Turbine and the S-4 HRSG after abatement by A-3 SCR System) shall not exceed 19.2 pounds per hour or 0.00904 lb/MM BTU (HHV) of natural gas fired. (PSD for NO_x)

(b) The nitrogen oxide emission concentration at emission points P-1 and P-2 each shall not exceed 2.5 ppmv, on a dry basis, corrected to 15% O_2, averaged over any 1-hour period. (BACT for NO_x)

(c) Carbon monoxide mass emissions at P-1 and P-2 each shall not exceed 28.07 pounds per hour, averaged over any rolling 3-hour period. (PSD for CO)

(d) When the heat input to a combustion turbine exceeds 1700 MM BTU/hr (HHV), the carbon monoxide emission concentration at P-1 and P-2 each shall not exceed 6.0 ppmv, on a dry basis, corrected to 15% O_2, and the carbon monoxide mass emission rate at P-1 and P-2 each shall not exceed 0.0132 lb/MM BTU of natural gas fired, averaged over any rolling 3-hour period. If compliance source test results and continuous emission monitoring data indicate that a lower CO emission concentration level can be achieved on a consistent basis (with a suitable compliance margin subject to APCO review and approval) over the entire range of turbine operating conditions, including duct firing and power steam augmentation operations, and over the entire range of ambient conditions, the District will reduce this limit to a level not lower than 4.0 ppmv, on a dry basis, corrected to 15% O_2. If this limit is reduced, the corresponding mass emission rate limit specified in ~~condition~~part 20(c) shall also be modified to reflect this reduction. (BACT for CO)

(e) Ammonia (NH_3) emission concentrations at P-1 and P-2 each shall not exceed 5 ppmv, on a dry basis, corrected to 15% O_2, averaged over any rolling 3-hour period. This ammonia emission concentration shall be verified by the continuous recording of the ammonia injection rate to A-1 and A-2 SCR Systems. The correlation between the gas turbine and HRSG heat input rates, A-1 and A-2 SCR System ammonia injection rates, and corresponding ammonia emission concentration at emission points P-1 and P-2 shall be determined in accordance with permit ~~condition~~part 30. (TRMP for NH_3)

(f) Precursor organic compound (POC) mass emissions (as CH_4) at P-1 and P-2 each shall not exceed 2.7 pounds per hour or 0.00126 lb/MM BTU of natural gas fired. (BACT)

(g) Sulfur dioxide (SO_2) mass emissions at P-1 and P-2 each shall not exceed 1.28 pounds per hour or 0.0006 lb/MM BTU of natural gas fired. (BACT)

(h) Particulate matter (PM_{10}) mass emissions at P-1 and P-2 each shall not exceed 9 pounds per hour or 0.00452 lb PM_{10}/MM BTU of natural gas fired when HRSG duct burners are not in operation. Particulate matter (PM_{10}) mass emissions at P-1 and P-2 each shall not exceed 12 pounds per hour or 0.00565 lb PM_{10}/MM BTU of natural gas fired when HRSG duct burners are in operation. (BACT)

21. The regulated air pollutant mass emission rates from each of the Gas Turbines (S-1 and S-3) during a start-up or a shutdown shall not exceed the limits established below. (PSD)

	Start-Up (lb/start-up)	Start-Up (lb/hr)	Shutdown (lb/shutdown)
Oxides of Nitrogen (as NO_2)	240	80	18
Carbon Monoxide (CO)	2,514	902	43.8

Precursor Organic Compounds (as CH_4)	48	16	5

~~22. The Gas Turbines (S-1 and S-3) shall not be in start-up mode simultaneously. (PSD)~~

~~23. The heat recovery steam generators (S-2 & S-4) and associated ducting shall be designed and constructed such that an oxidation catalyst can be readily installed and properly operated if deemed necessary by the APCO to insure compliance with the CO emission rate limitations of conditionparts 20(c) and 20(d). (BACT)~~

24. Total combined emissions from the Gas Turbines and HRSGs (S-1, S-2, S-3, and S-4), including emissions generated during Gas Turbine start-ups and shutdowns shall not exceed the following limits during any calendar day:

(a)	1,362.6 pounds of NO_x (as NO_2) per day	(CEQA)
(b)	7,891.1 pounds of CO per day	(PSD)
(c)	230.2 pounds of POC (as CH_4) per day	(CEQA)
(d)	510 pounds of PM_{10} per day	(PSD)
(e)	57.9 pounds of SO_2 per day	(BACT)

25. Cumulative combined emissions from the Gas Turbines and HRSGs (S-1, S-2, S-3, and S-4), including emissions generated during gas turbine start-ups and shutdowns shall not exceed the following limits during any consecutive twelve-month period:

(a)	123.4 tons of NO_x (as NO_2) per year	(Offsets)
(b)	588 tons of CO per year	(Cumulative Increase, PSD)
(c)	28 tons of POC (as CH_4) per year	(Offsets)
(d)	83.34 tons of PM_{10} per year	(Offsets)
(e)	10.6 tons of SO_2 per year	(Cumulative Increase)

26. The maximum projected annual toxic air contaminant emissions (per ~~condition~~part 29) from the Gas Turbines and HRSGs combined (S-1, S-2, S-3, and S-4) shall not exceed the following limits:

formaldehyde	3,796 pounds per year
benzene	480 pounds of per year
Specified polycyclic aromatic hydrocarbons (PAHs)	22.8 pounds of per year

unless the following requirement is satisfied:

The owner/operator shall perform a health risk assessment using the emission rates determined by source test and the most current Bay Area Air Quality Management District approved procedures and unit risk factors in effect at the time of the analysis. This risk analysis shall be submitted to the District and the CEC CPM within 60 days of the source test date. The owner/operator may request that the District and the CEC CPM revise the carcinogenic compound emission limits specified above. If the owner/operator demonstrates to the satisfaction of the APCO that these revised emission limits will result in a cancer risk of not more than 1.0 in one million, the District and the CEC CPM may, at their discretion, adjust the carcinogenic compound emission limits listed above. (TRMP)

27. The owner/operator shall demonstrate compliance with ~~condition~~parts 14 through 17, 20(a) through 20(d), 21, 22, 24(a), 24(b), 25(a), and 25(b) by using properly operated and maintained continuous monitors (during all hours of operation including equipment Start-up and Shutdown periods) for all of the following parameters:

(a) Firing Hours and Fuel Flow Rates for each of the following sources: S-1 & S-2 combined and S-3 & S-4 combined.
(b) Oxygen (O_2) Concentrations, Nitrogen Oxides (NO_x) Concentrations, and Carbon Monoxide (CO) Concentrations at each of the following exhaust points: P-1 and P-2.
(c) Ammonia injection rate at A-1 and A-2 SCR Systems
(d) Steam injection rate at S-1 & S-3 Gas Turbine Combustors

The owner/operator shall record all of the above parameters every 15 minutes (excluding normal calibration periods) and shall summarize all of the above parameters for each clock hour. For each calendar day, the owner/operator shall calculate and record the total firing hours, the average hourly fuel flow rates, and pollutant emission concentrations.

The owner/operator shall use the parameters measured above and District-approved calculation methods to calculate the following parameters:

(e) Heat Input Rate for each of the following sources: S-1 & S-2 combined and S-3 & S-4 combined.
(f) Corrected NO_x concentrations, NO_x mass emissions (as NO_2), corrected CO concentrations, and CO mass emissions at each of the following exhaust points: P-1 and P-2.

For each source, source grouping, or exhaust point, the owner/operator shall record the parameters specified in ~~condition~~parts 27(e) and 27(f) at least once every 15 minutes (excluding normal calibration periods). As specified below, the owner/operator shall calculate and record the following data:

(g) total Heat Input Rate for every clock hour and the average hourly Heat Input Rate for every rolling 3-hour period.
(h) on an hourly basis, the cumulative total Heat Input Rate for each calendar day for the following: each Gas Turbine and associated HRSG combined and all four sources (S-1, S-2, S-3, and S-4) combined.
(i) the average NO_x mass emissions (as NO_2), CO mass emissions, and corrected NO_x and CO emission concentrations for every clock hour and for every rolling 3-hour period.
(j) on an hourly basis, the cumulative total NO_x mass emissions (as NO_2) and the cumulative total CO mass emissions, for each calendar day for the following: each GasTurbine and associated HRSG combined, and all four sources (S-1, S-2, S-3, and S-4) combined.
(k) For each calendar day, the average hourly Heat Input Rates, Corrected NO_x emission concentrations, NO_x mass emissions (as NO_2), corrected CO emission concentrations, and CO mass emissions for each Gas Turbine and associated HRSG combined.

(l) on a daily basis, the cumulative total NO_x mass emissions (as NO_2) and cumulative total CO mass emissions, for the previous consecutive twelve month period for all four sources (S-1, S-2, S-3, and S-4) combined.

(1-520.1, 9-9-501, BACT, Offsets, NSPS, PSD, Cumulative Increase)

28. To demonstrate compliance with ~~condition~~part~~s~~ 20(f), 20(g), 20(h), 21, 24(c) through 24(e), and 25(c) through 25(e), the owner/operator shall calculate and record on a daily basis, the Precursor Organic Compound (POC) mass emissions, Fine Particulate Matter (PM_{10}) mass emissions (including condensable particulate matter), and Sulfur Dioxide (SO_2) mass emissions from each power train. The owner/operator shall use the actual Heat Input Rates calculated pursuant to ~~condition~~part 27, actual Gas Turbine Start-up Times, actual Gas Turbine Shutdown Times, and CEC and District-approved emission factors to calculate these emissions. The calculated emissions shall be presented as follows:

(a) For each calendar day, POC, PM_{10}, and SO_2 emissions shall be summarized for: each power train (Gas Turbine and its respective HRSG combined) and all four sources (S-1, S-2, S-3, and S-4) combined.

(b) on a daily basis, the cumulative total POC, PM_{10}, and SO_2 mass emissions, for each year for all four sources (S-1, S-2, S-3, and S-4) combined.

(Offsets, PSD, Cumulative Increase)

29. To demonstrate compliance with ~~C~~ondition~~P~~art 26, the owner/operator shall calculate and record on an annual basis the maximum projected annual emissions of: Formaldehyde, Benzene, and Specified PAH's. Maximum projected annual emissions shall be calculated using the maximum Heat Input Rate of 35,274,060 MM BTU/year and the highest emission factor (pounds of pollutant per MM BTU of Heat Input) determined by any source test of the S-1 & S-3 Gas Turbines and/or S-2 & S-4 Heat Recovery Steam Generators. If the highest emission factor for a given pollutant occurs during minimum-load turbine operation, a reduced annual heat input rate may be utilized to calculate the maximum projected annual emissions to reflect the reduced heat input during gas turbine start-up and minimum-load operation. The reduced annual heat input rate shall be subject to the review and approval of the District. (TRMP)

30. Within 60 days of start-up of the MEC, the owner/operator shall conduct a District-approved source test on exhaust point P-1 or P-2 to determine the corrected ammonia (NH_3) emission concentration to determine compliance with ~~condition~~part 20(e). The source test shall

determine the correlation between the heat input rates of the gas turbine and associated HRSG, A-1 or A-2 SCR System ammonia injection rate, and the corresponding NH_3 emission concentration at emission point P-1 or P-2. The source test shall be conducted over the expected operating range of the turbine and HRSG (including, but not limited to, minimum and full load, and steam injection power augmentation mode) to establish the range of ammonia injection rates necessary to achieve NO_x emission reductions while maintaining ammonia slip levels. This source testing shall be repeated on an annual basis thereafter. Continuing compliance with ~~condition~~part 20(e) shall be demonstrated through calculations of corrected ammonia concentrations based upon the source test correlation and continuous records of ammonia injection rate. (TRMP)

31. Within 60 days of start-up of the MEC and on an annual basis thereafter, the owner/operator shall conduct a District-approved source test on exhaust points P-1 and P-2 while each Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum load (including steam injection power augmentation mode) to determine compliance with ~~Condition~~Parts 20(a), (b), (c), (d), (f), (g), and (h), while each Gas Turbine and associated Heat Recovery Steam Generator are operating at minimum load to determine compliance with ~~Condition~~Parts 20(c) and (d), and to verify the accuracy of the continuous emission monitors required in ~~condition~~part 29. The owner/operator shall test for (as a minimum): water content, stack gas flow rate, oxygen concentration, precursor organic compound concentration and mass emissions, nitrogen oxide concentration and mass emissions (as NO_2), carbon monoxide concentration and mass emissions, sulfur dioxide concentration and mass emissions, methane, ethane, and particulate matter (PM_{10}) emissions including condensable particulate matter. (BACT, offsets)

32. The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section and the CEC CPM prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as specified in Volume V of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section and the CEC CPM in writing of the source test protocols and projected test dates at least 7 days prior to the testing date(s). As indicated above, the Owner/Operator shall measure the contribution of condensable PM (back half) to the total PM_{10} emissions. However, the Owner/Operator may propose alternative measuring techniques to measure condensable PM such as the use of a dilution tunnel or other appropriate method used to capture semi-volatile organic compounds. Source test results shall be submitted to the District and the CEC CPM within 60 days of conducting the tests. (BACT)

33. Within 60 days of start-up of the MEC and on an biennial basis (once every two years) thereafter, the owner/operator shall conduct a District-approved source test on exhaust point P-1 or P-2 while the Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum allowable operating rates to demonstrate compliance with ~~Condition~~Part 26. The gas turbine shall also be tested at minimum load. If three consecutive biennial source tests demonstrate that the annual emission rates calculated pursuant to ~~condition~~part 29 for any of the compounds listed below are less than the BAAQMD Toxic Risk Management Policy trigger levels shown, then the owner/operator may discontinue future testing for that pollutant:

Benzene	≤	26.8 pounds/year
Formaldehyde	≤	132 pounds/year
Specified PAH's	≤	0.18 pounds/year

(TRMP)

34. The owner/operator of the MEC shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, and equipment breakdown reports) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual. Data from any source test required by this permit shall be submitted to the District within 30 days of the testing date, unless otherwise indicated. (Regulation 2-6-502)

35. The owner/operator of the MEC shall maintain all records and reports on site for a minimum of 5 years. These records shall include but are not limited to: continuous monitoring records (firing hours, fuel flows, emission rates, monitor excesses, and breakdowns), source test and analytical records, natural gas sulfur content analysis results, emission calculation records, records of plant upsets and related incidents. The owner/operator shall make all records and reports available to District and the CEC CPM staff upon request. (Regulation 2-6-501)

36. The owner/operator of the MEC shall notify the District and the CEC CPM of any violations of these permit conditions. Notification shall be submitted in a timely manner, in accordance with all applicable District Rules, Regulations, and the Manual of Procedures. Notwithstanding the notification and reporting requirements given in any District Rule, Regulation, or the Manual of Procedures, the owner/operator shall submit written notification (facsimile is acceptable) to the Enforcement Division within 96 hours of the violation of any permit condition. (Regulation 2-1-403)

37. The stack height of emission points P-1 and P-2 shall each be at least 145 feet above grade level at the stack base. (PSD, TRMP)

38. The Owner/Operator of MEC shall provide adequate stack sampling ports and platforms to enable the performance of source testing. The location and configuration of the stack sampling ports shall be subject to BAAQMD review and approval. (Regulation 1-501)

39. Within 180 days of the issuance of the Authority to Construct for the MEC, the Owner/Operator shall contact the BAAQMD Technical Services Division regarding requirements for the continuous emission monitors, sampling ports, platforms, and source tests required by ~~condition~~parts 27, 30, 31, 33, and 47. All source testing and monitoring shall be conducted in accordance with the BAAQMD Manual of Procedures. (Regulation 1-501)

40. Prior to the issuance of the BAAQMD Authority to Construct for the Metcalf Energy Center, the Owner/Operator shall demonstrate that valid emission reduction credits in the amount of 212.75 tons/year of Nitrogen Oxides and 28 tons/year of Precursor Organic Compounds or equivalent (as defined by District Regulations 2-2-302.1 and 2-2-302.2) are under their control through enforceable contracts, option to purchase agreements, or equivalent binding legal documents. (Offsets)

41. Prior to the start of construction of the Metcalf Energy Center, the Owner/Operator shall provide to the District valid emission reduction credit banking certificates in the amount of 212.75 tons/year of Nitrogen Oxides and 28 tons/year of Precursor Organic Compounds or equivalent as defined by District Regulations 2-2-302.1 and 2-2-302.2. (Offsets, CEC)

42. Pursuant to BAAQMD Regulation 2, Rule 6, section 404.1, the owner/operator of the MEC shall submit an application to the BAAQMD for a major facility review permit within 12 months of the issuance of the PSD permit for the MEC. (Regulation 2-6-404.1)

43. Pursuant to 40 CFR Part 72.30(b)(2)(ii) of the Federal Acid Rain Program, the owner/operator of the Metcalf Energy Center shall submit an application for a Title IV operating permit to the BAAQMD. Operation of any of the gas turbines (S-1 & S-3) or HRSGs (S-2 & S-4) without a Title IV operating permit may not occur sooner than 24 months after the application is received by the BAAQMD. (Regulation 2, Rule 7)

44. The owner/operator shall comply with the continuous emission monitoring requirements of 40 CFR Part 75. (Regulation 2, Rule 7)

45. The owner/operator shall take monthly samples of the natural gas combusted at the MEC. The samples shall be analyzed for sulfur content using District-approved laboratory methods. The sulfur content test results shall be retained on site for a minimum of five years from the test date and shall be utilized to satisfy the requirements of 40 CFR Part 60, subpart GG. (cumulative increase)

46. The owner/operator shall properly install the cooling towers and shall maintain them to minimize drift losses. The cooling towers shall be equipped with high-efficiency mist eliminators with a maximum guaranteed drift rate of 0.0005%. The maximum total dissolved solids (TDS) measured at the base of the cooling towers or at the point of return to the wastewater facility shall not be higher than 5,438 ppmw (mg/l). The owner/operator shall sample the water at least once per day. (PSD)

47. The owner/operator shall perform a visual inspection of the cooling tower drift eliminators at least once per calendar year, and repair or replace any drift eliminator components which are broken or missing. Prior to the initial operation of the Metcalf Energy Center, the owner/operator shall have the cooling tower vendor's field representative inspect the cooling tower drift eliminators and certify that the installation was performed in a satisfactory manner. Within 60 days of the initial operation of the cooling tower, the owner/operator shall perform an initial performance source test to determine the PM_{10} emission rate from the cooling tower to verify compliance with the vendor-guaranteed drift rate specified in ~~condition~~part 46. The CPM may, in years 5 and 15 of cooling tower operation, require the owner/operator to perform source tests to verify continued compliance with the vendor-guaranteed drift rate specified in ~~condition~~part 46. (PSD)

RECOMMENDATION

Issue a **conditional Authority to Construct** for the following equipment:

A-3 Oxidation Catalyst, abating S-1 Gas Turbine #1 and S-2 HRSG #1

A-4 Oxidation Catalyst, abating S-1 Gas Turbine #2 and S-2 HRSG #2

EXEMPT SOURCES

None__

___Dennis Jang_____ **_____9/5/02_____**

Air Quality Engineer II **Date**

Application 11251
March 30, 2005

Metcalf Energy Center, LLC ; Plant #12183
7905 Monterey Road, San Jose CA 95139

BACKGROUND

The Metcalf Energy Center, LLC (MEC) is applying for a change of permit conditions that apply to the following permitted sources:

S-1 Combustion Gas Turbine #1, Westinghouse 501FD; 1,990.5 MM BTU per hour, equipped with dry low-NO_x Combustors, abated by A-1 Selective Catalytic Reduction System and A-3 Oxidation Catalyst

S-3 Combustion Gas Turbine #2, Westinghouse 501FD; 1,990.5 MM BTU per hour, equipped with dry low-NO_x Combustors, abated by A-2 Selective Catalytic Reduction System and A-4 Oxidation Catalyst

The MEC is under construction and first fire is anticipated for March of 2005. MEC is requesting the following significant changes to the existing permit conditions for the facility. Many of these changes are in conceptual agreement with recent changes made to the permit conditions for the existing Los Medanos Energy Center (LMEC) and Delta Energy Center (DEC). Because the LMEC and DEC employ GE turbines and MEC will utilize Westinghouse turbines the gas turbine start-up emission rates requested by MEC are higher than those at LMEC and DEC.

- Add a definition to the permit conditions for "steam turbine cold start-up" with a maximum duration of 360 minutes in accordance with the HRSG and steam turbine manufacturer's recommendations. Cold steam turbine start-ups occur after the steam turbine (and by inference, both gas turbines) have been out of operation for more than 72 hours. The permit currently contains a definition of gas turbine start-up with a maximum duration of 180 minutes and does not distinguish between "cold" or "hot" start-ups. This same definition has already been added to the LMEC and DEC permits.

- Add steam turbine cold start-up mass emission rates to condition 21 to reflect the extended duration of cold steam turbine start-up periods which can take up to six hours (360 minutes). Because the turbine must be maintained at low load set points for various durations, the total mass POC, CO, and NOx emissions for cold steam turbine start-up are greater than the current permit limits. The proposed new NOx, CO, and POC mass emission limits for cold start-ups are 480 lb NOx/start-up, 5,028 lb CO/start-up, and 96 lb POC/start-up. The applicant has modeled these new NOx and CO emission rates and shown that they will not interfere with the attainment or maintenance of any applicable ambient air quality standards for NOx or CO.

- MEC is also requesting that the existing turbine start-up pound per hour limits for NOx, CO, and POC be removed since the short-term turbine emission rates may exceed these levels before the SCR and oxidation catalysts reach operating temperature. However, the pound per start-up limits for warm/hot start-ups will remain in place and will not be exceeded. Because the applicant has modeled the 1-hour NOx and 1-hour CO impacts resulting from turbine emission rates of 480 lb NOx/hr and 5028 lb CO/hr, the removal of the 80 lb/hr NOx limit and 902 lb/hr CO limit is acceptable.

- MEC is requesting the exclusion of gas turbine combustor tuning activities from the BACT emission rate limits governing baseload gas turbine operation. The exclusion would apply to combustor tuning activities that occur after the periodic replacement of combustor parts and after routine maintenance inspections. After the new parts are installed or the turbine is inspected, the turbine combustors must be tuned at various speeds and load levels. During this tuning, the turbine is held at various operating points for various durations. Consequently, the gas turbine does not comply continuously with the CO and NOx emission limitations while it is being tuned. The combustor tuning periods will not exceed 360 minutes in length and will be subject to the same NOx, CO, and POC mass emission limits as proposed for the steam turbine cold start-ups. This exclusion has been added to the permits for LMEC and DEC.

- A condition will be added limiting the total number of hours of cold steam turbine start-ups and combustor tuning combined to 30 hours per gas turbine per year. This limit is indicative of the low frequency of these events and will help insure that annual mass emission limits are not exceeded.

- MEC is requesting changes to the permit conditions governing the commissioning period prior to the installation, tuning, and operation of the oxidation catalysts and SCR systems. Specifically, they are requesting an increase in the allowable hourly and daily CO emissions from 930 lb/hr to 5,000 lb/hr and 11,498 lb/day to 20,000 lb/day. This request is based upon Calpine's experience with the commissioning of the Los Medanos Energy Center, Delta Energy Center, and recommendations from Westinghouse, the gas turbine manufacturer.

- Based upon their experience with the first year of operation of the Los Medanos Energy Center and Delta Energy Center, the MEC has requested that the annual limit on NOx emissions for the first year of operation (including commissioning period emissions) be reduced from 185 tons per year to 150 tons per year. Accordingly, part 10 of the permit conditions will be revised and MEC will receive a banking certificate in the amount of 40.25 tons of POC since they opted to provide POC emission reduction credits to offset a portion of the NOx emission increases for the MEC when it was originally permitted. This is acceptable since the NOx emissions from the gas turbines and HRSGs are continuously monitored with CEMs.

- Based upon their experience with the Sutter Energy Center which is equipped with Siemens/Westinghouse gas turbines, MEC is requesting that the gas turbine shutdown emission rate limits be increased from 18 lb/hr to 80 lb/hr for NOx, 43.8 lb/hr to 902 lb/hr for CO, and from 5 lb/hr to 16 lb/hr for POC. This request is acceptable because it does not trigger PSD modeling and the NOx and CO emissions from the turbines are continuously monitored at all times, including turbine shutdown. The POC emissions during shutdown will be determined by source testing on an annual basis.

- All source testing will be required within 90 days of start-up and all source test reports submittals will be required within 60 days of the source test date. Based upon the commissioning of the Los Medanos and Delta Energy Centers, these testing and reporting requirements are more realistic and reasonable than the current 60-day testing and 30-day reporting requirements.

The proposed changes will not require any increases in facility daily emissions since the operator will still comply with the permit condition requiring that only one turbine can be in start-up mode at any one time. The proposed changes will not result in any increase in annual mass emission rates since the steam turbine cold starts and combustor tuning will occur only a few

times per year and will be subject to a combined limit of 30 hours per year per gas turbine. Therefore, no offsets will be required.

However, the increases in gas turbine NOx and CO start-up emission rates and maximum hourly CO emission rate during commissioning require a revised PSD modeling analysis to determine the 1-hr NOx and 1-hr & 8-hr CO impacts of those emission increases. Because the PSD impacts analysis for the MEC has been revised, the proposed permit condition changes will be subject to the public notice and public comment requirements of Regulation 2-2-405 and 2-2-406.

Because the proposed permit condition changes involve increases in short-term emission rates, the changes are considered to be a significant permit revision under Title V. However, the initial Title V permit has not yet been issued for the MEC. Therefore, the proposed permit condition changes will be included in the Title V permit when it is issued.

CRITERIA-POLLUTANT EMISSION SUMMARY

Annual Average Project Emissions Increase:

There will no increase in annual emissions as a result of the proposed permit condition changes since they address short-term emission rates only.

Daily Maximum Emissions by Source (lb/day):

There will be no increase in maximum daily NOx, CO, POC, PM_{10}, or SO_2 emissions from the gas turbines (excluding commissioning period) as a result of the proposed permit conditions changes. Although the gas turbine start-up emission rates will increase when the steam turbine is "cold" (i.e. has been down for more than 72 hours), the existing daily combined mass limits for the gas turbines will not be exceeded since they are based upon the "worst-case" emission scenario when both turbines are started in one day. The owner/operator will manage the start-up of the gas turbines so that the daily limits are not exceeded.

Short-Term Emission Rates:

The proposed changes in gas turbine start-up/combustor tuning emission rates and commissioning emissions are shown in the following table. The emission rates for the cold start-up are double the emission rates for "standard" start-ups since the cold start-up is twice as long as a standard start-up.

Table 1
Current and Proposed Short-Term Emission Rate Limits for S-1 and S-3 Gas Turbines

	NOx		CO		POC	
Operating Mode	Current	Proposed	Current	Proposed	Current	Proposed
Start-up[1] (lb/hr)	80	none	838	none	16	none
Start-up[1] (lb/start-up)	240	240[3]	2,514	2,514[4]	48	48
Cold Start-up[2] or Combustor Tuning (lb/period)	none	480	none	5,028	none	96
Shutdown	18	80	43.8	902	5	16
Commissioning (lb/hr)	381.2	381.2	930	5,000	none	none

Commissioning (lb/day)	4,805	4,805	11,498	20,000	495	495

[1]maximum duration of 180 minutes

[2]maximum duration of 360 minutes

[3]modeling of turbine emission rate of 480 lb NOx/hr showed compliance with 1-hr NOx ambient air quality standard; therefore, de-facto emission rate of 240 lb NOx/hr is acceptable

[4]modeling of turbine emission rate of 5028 lb CO/hr showed compliance with 1-hr CO ambient air quality standard; therefore, de-facto emission rate of 2,514 lb CO/hr is acceptable

Table 2
Current Estimated Maximum Daily Emissions from Gas Turbines and HRSGs (lb/day)

Source (Operating Mode)	NO_2	CO	POC	PM_{10}	SO_2
S-1 Gas Turbine (Start-up)	240	2,514	48	27	3.6
S-1 Gas Turbine & S-2 HRSG (Full load w/Duct Burner Firing and steam injection power augmentation[a])	307.2	747.6	86.4	192	20.5
S-1 Gas Turbine (Full load w/o Duct Burner Firing[b])	72	175.1	20	36	4.8
S-1 Gas Turbine (Hot Start-up)	80	902	16	9	1.2
S-3 Gas Turbine (Cold Start-up[c])	240	2,514	48	27	3.6
S-3 Gas Turbine & S-4 HRSG (Full load w/Duct Burner Firing and steam injection power augmentation[a])	307.2	747.6	86.4	192	20.5
S-3 Gas Turbine (Full load w/o Duct Burner Firing[d])	36	87.6	10	18	2.4
S-3 Gas Turbine (Hot Start-up)	80	902	16	9	1.2
Total	**1,362.4**	**8,590**	**330.8**	**510**	**57.8**

[a]based upon 16 hours of operation at maximum combined heat input of 2,124 MM BTU/hr

[b]based upon 4 hours of operation at maximum heat input of 1,990.5 MM BTU/hr

[c]occurs at beginning of third hour of 24 hour period

[d]based upon 2 hours of operation at maximum heat input of 1,990.5 MM BTU/hr

Table 3
Proposed Estimated Maximum Daily Emissions from Gas Turbines and HRSGs (lb/day)

Source (Operating Mode)	NO_2	CO	POC	PM_{10}	SO_2
S-1 Gas Turbine (Steam Turbine Cold Start-up; 6-hour)	480	5,028	96	54	7.2
S-1 Gas Turbine & S-2 HRSG (Full load w/Duct Burner Firing and steam injection power augmentation[a])	345.6	505.26	86.4	216	23.04
S-3 Gas Turbine (Start-up[b]; 3-hr)	240	2,514	48	27	3.6
S-3 Gas Turbine & S-4 HRSG (Full load w/Duct Burner Firing and steam injection power augmentation[c])	288	421	86.4	180	19.2
Total	**1,353.6**	**8,468**	**330.8**	**477**	**53.04**

[a]based upon 18 hours of operation at maximum combined heat input of 2,124 MM BTU/hr

[b]occurs at beginning of seventh hour of 24 hour period

[c]based upon 15 hours of operation at maximum heat input of 1,990.5 MM BTU/hr

The operating scenarios shown in Tables 2 and 3 are based upon maximum emission rates and assume maximum possible duct burner firing per 24 hour day and are not likely to occur. Consequently, there will no increase in the daily mass emission limits specified in part 24 of the permit conditions.

FACILITY CUMULATIVE INCREASE
(since April 5, 1991)

Because there will no increase in annual emissions as a result of the proposed permit condition changes there will be no change in the facility NSR cumulative increase.

TOXIC RISK SCREENING ANALYSIS

Because the proposed permit condition changes will not result in any increase in annual toxic air contaminant emissions from any source at the MEC facility, no toxic risk screening is required.

BACT ANALYSIS

Because the proposed permit condition changes will not result in any increase in daily or annual emissions from any source at the MEC facility (excluding operation of gas turbines during commissioning period), the BACT provision of NSR does not apply.

OFFSET ANALYSIS

As discussed earlier, MEC has decided, based upon their commissioning experience with the Los Medanos Energy Center and Delta Energy Center, that the NOx mass emission limit for the first

year of operaton can be reduced from 185 tons per year to 150 tons per year. Because the applicant provided sufficient emission reduction credits to offset a NOx emission increase of 185 tons per year, they are entitled to a refund of (1.15)(35) = 40.25 tons per year of offsets. Because MEC submitted POC ERCs to offset the majority of NOx emission increases under the original permit application 27215, the refunded offsets will be 40.25 tons of POC per year.

PSD AIR QUALITY IMPACT ANALYSIS

When the MEC was originally permitted, the short-term air quality impacts during gas turbine start-up periods was modeled to comply with the District PSD regulations. Under the partial PSD Re-delegation agreement between the District and EPA, the District has primary responsibility for minor modifications to the PSD permit for the MEC. Therefore, the 1-hr NOx and 1-hr & 8-hr CO impacts of the MEC during start-up must be remodeled to reflect the increases in short-term NOx and CO emission rates.

TABLE 4
Averaging period emission rates used in modeling analysis (g/s)

	Commissioning		Startup	
Pollutant Source	(1-hour)	(8-hour)	(1-hour)	(8-hour)
NO_x				
Turbine 1	24.02	n/a	60.48	n/a
Turbine 2	24.02		2.42	
Fire Pump				
Emergency Generator				
Cooling Tower				
CO				
Turbine 1	315.0	39.37	633.53	80.08
Turbine 2	315.0	39.38	3.54	14.21
Fire Pump				
Emergency Generator				0.05
Cooling Tower				

As shown above, the NOx modeling for the commissioning period assumed that each turbine emitted 190.6 lb NOx/hr. The CO modeling for the commissioning period assumed that each turbine emitted 2,500 lb CO/hr.

TABLE 5
California and national ambient air quality standards and ambient air quality levels from the proposed ($\mu g/m^3$)

Pollutant	Averaging Time	Maximum Background	Maximum Project impact	Maximum Project impact plus maximum background	California Standards	National Standards
NO_2	1-hour	249	193	442	470	---
CO	1-hour	10,267	11,073	21,340	23,000	40,000

As shown, the maximum project impacts resulting from the increased gas turbine NOx and CO emission rates during start-up/combustor tuning and commissioning will not result in the exceedance of any applicable state or federal ambient air quality standards.

Pursuant to BAAQMD Regulation 2-2-414.1, the applicant has submitted a modeling analysis that adequately estimates the revised air quality impacts of the MEC project. The applicant's analysis was based on EPA-approved models and was performed in accordance with District Regulation 2-2-414.

Pursuant to Regulation 2-2-414.2, the District has found that the modeling analysis has demonstrated that the proposed emission increases from the MEC facility, in conjunction with all other applicable emissions, will not cause or contribute to a violation of applicable ambient air quality standards for NO_2 and CO or an exceedance of any applicable PSD increment.

Please see appendix A for the complete summary report on the revised PSD air quality impact analysis for the MEC.

PUBLICATION AND PUBLIC COMMENT

The proposed increases in gas turbine NOx and CO start-up emission rates and maximum hourly CO emission rate during commissioning require a revised PSD modeling analysis to determine the 1-hr NOx and 1-hr & 8-hr CO impacts of those emission increases. Because the PSD impacts analysis for the MEC has been revised, the proposed permit condition changes will be subject to the public notice and public comment requirements of Regulation 2-2-405 and 2-2-406.

TITLE IV/V OPERATING PERMIT ANALYSIS

Pursuant to Regulation 2-6-226.6, the proposed changes in gas turbine start-up emission rates, the allowance for combustor tuning activities, and related changes in permit conditions constitute significant permit revisions for the purposes of Title V permitting since they trigger case-by-case determinations relative to the air quality impact analysis requirements of PSD. However, the initial Title V permit has not yet been issued for the MEC. Therefore, the changes proposed under this permit will be included with the draft Title V permit when it is offered for public comment.

FEE SUMMARY

Source	Fee Schedule	Filing Fee	Initial Fee	Late Fee	Permit to Operate Fee	Source Sub-Total
S-1 Gas Turbine #1	B	$259.00	$63,733.00	$0.00	$0.00	$63,992.00
S-3 Gas Turbine #3	B	$0.00	$0.00	$0.00	$0.00	$0.00
					Grand Total	**$63,992.00**
					Amount Paid	**$63,992.00**

STATEMENT OF COMPLIANCE

S-1 and S-3 Gas Turbines are expected to comply all applicable District, State, and Federal regulations and District permit conditions. As discussed earlier, the proposed increases in gas turbine start-up and commissioning emission rates comply with the air quality impact analysis requirements of the District PSD regulations.

This project is **categorically exempt** from District CEQA Regulation 2-1-311 pursuant to Regulation 2-1-312.11 (Permit applications for a new/modified source(s) or for process changes which will satisfy the "No Net Emission Increase" provisions of Regulation 2, Rule 2, and for which there is no possibility that the project may have any significant environmental effect in connection with any environmental media or resources other than air quality) and therefore is not subject to CEQA review.

The Metcalf Energy Center facility is **not** located within 1000 feet of the outer boundary of a K-12 school and is therefore not subject to the public notification requirements of Regulation 2-1-412.

A Toxics Risk Screening Analysis is not required since the proposed permit condition changes will not result in any increase in worst-case annual toxic air contaminant emissions. TBACT does not apply to this project.

The proposed emission rate changes and permit condition changes do not trigger new reviews of the BACT, Offsets, PSD, NSPS, and NESHAPS regulations.

PERMIT CONDITIONS

Condition #18310
For S-1 & S-2 Gas Turbines, S-3 & S-4 HRSGs, and S-5 Cooling Tower

Definitions:

Clock Hour:	Any continuous 60-minute period beginning on the hour.
Calendar Day:	Any continuous 24-hour period beginning at 12:00 AM or 0000 hours.
Year:	Any consecutive twelve-month period of time

Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in BTU/scf.
Rolling 3-hour period:	Any three-hour period that begins on the hour and does not include start-up or shutdown periods.
Firing Hours:	Period of time during which fuel is flowing to a unit, measured in fifteen-minute increments.
MM BTU:	million British thermal units
Gas Turbine Start-up Mode:	The lesser of the first 180 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of parts 20(b) and 20(d).
Gas Turbine Shutdown Mode:	The lesser of the 30-minute period immediately prior to the termination of fuel flow to the Gas Turbine or the period of time from non-compliance with any requirement listed in Parts 20(b) through 20(d) until termination of fuel flow to the Gas Turbine.
Gas Turbine Cold Start-up Period:	The lesser of the first 360 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of part 20(b), following a shutdown of at least 72 hours
Specified PAHs:	The polycyclic aromatic hydrocarbons listed below shall be considered to Specified PAHs for these permit conditions. Any emission limits for Specified PAHs refer to the sum of the emissions for all six of the following compounds. Benzo[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Dibenzo[a,h]anthracene Indeno[1,2,3-cd]pyrene
Corrected Concentration:	The concentration of any pollutant (generally NO_x, CO, or NH_3) corrected to a standard stack gas oxygen concentration. For emission point P-1 (combined exhaust of S-1 Gas Turbine and S-2 HRSG duct burners) and emission point P-2 (combined exhaust of S-3 Gas Turbine and S-4 HRSG duct burners) the standard stack gas oxygen concentration is 15% O_2 by volume on a dry basis.
Commissioning Activities:	All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the MEC construction contractor to insure safe and reliable steady state operation of the gas turbines, heat recovery steam generators, steam turbine, air pollution control systems, and associated electrical delivery systems.
Commissioning Period:	The Period shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed, or when a gas turbine is first fired, whichever occurs first. The period shall terminate when the plant has successfully completed performance testing, is available for commercial operation, and has initiated sales to the power exchange. The commissioning period shall not exceed 180 days under any circumstances.
Combustor Tuning Activities:	Any testing, adjustment, tuning, or calibration activities recommended by the gas turbine manufacturer to insure safe and reliable steady-state operation of the gas turbines following

	replacement of the combustor components, during seasonal tuning events, or at other times when recommended by the turbine manufacturer or as necessary to maintain low emissions performance. This includes, but is not limited to, adjusting the amount of fuel distributed between the combustion turbine's staged fuel systems to simultaneously minimize NOx and CO production while minimizing combustor dynamics and ensuring combustor stability.
Combustor Tuning Period:	The period, not to exceed 360 minutes, when combustor tuning activities are taking place.
Precursor Organic Compounds (POCs):	Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate
CEC CPM:	California Energy Commission Compliance Program Manager
MEC:	Metcalf Energy Center

Conditions for the Commissioning Period

1. The owner/operator of the Metcalf Energy Center (MEC) shall minimize emissions of carbon monoxide and nitrogen oxides from S-1 and S-3 Gas Turbines and S-2 and S-4 Heat Recovery Steam Generators (HRSGs) to the maximum extent possible during the commissioning period. Parts 1 through 12 shall only apply during the commissioning period as defined above. Unless otherwise indicated, Parts 13 through ~~47~~ 49 shall apply after the commissioning period has ended. (PSD for NOx and CO)

2. At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the S-1 & S-3 Gas Turbine combustors and S-2 & S-4 Heat Recovery Steam Generator duct burners shall be tuned to minimize the emissions of carbon monoxide and nitrogen oxides. (PSD for CO and NOx)

3. At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the A-1 and A-2 SCR Systems and A-3 and A-4 Oxidation Catalysts shall be installed, adjusted, and operated to minimize the emissions of carbon monoxide and nitrogen oxides from S-1 & S-3 Gas Turbines and S-2 & S-4 Heat Recovery Steam Generators. (PSD for CO and NOx)

4. Coincident with the steady-state operation of A-1 & A-2 SCR Systems and A-3 & A-4 Oxidation Catalysts pursuant to parts 3, 10, 11, and 12, the Gas Turbines (S-1 & S-3) and the HRSGs (S-2 & S-4) shall comply with the NO_x and CO emission limitations specified in parts 20(a) through 20(d). (BACT, Offsets)

5. The owner/operator of the MEC shall submit a plan to the District Permit Services Division and the CEC CPM at least four weeks prior to first firing of S-1 or S-3 Gas Turbines describing the procedures to be followed during the commissioning of the turbines, HRSGs, and steam turbine. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the Dry-Low-NO_x combustors, the installation and operation of the required emission control systems, the installation, calibration, and testing of the CO and NO_x continuous emission monitors, and any activities requiring the firing of the Gas Turbines (S-1 & S-3) and HRSGs (S-2 & S-4) without abatement by their respective SCR Systems. Neither Gas Turbine (S-1 or S-3) shall be fired sooner than 28 days after the District receives the commissioning plan. (PSD for NOx and CO)

6. During the commissioning period, the owner/operator of the MEC shall demonstrate compliance with parts 8 through 10 through the use of properly operated and maintained continuous emission monitors and data recorders for the following parameters:

   firing hours
   fuel flow rates
   stack gas nitrogen oxide emission concentrations,
   stack gas carbon monoxide emission concentrations
   stack gas oxygen concentrations.

   The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the Gas Turbines (S-1 & S-3) and HRSGs (S-2 & S-4). The owner/operator shall use District-approved methods to calculate heat input rates, nitrogen dioxide mass emission rates, carbon monoxide mass emission rates, and NO_x and CO emission concentrations, summarized for each clock hour and each calendar day. All records shall be retained on site for at least 5 years from the date of entry and made available to District personnel upon request. (9-9-501, BACT, Offsets)

7. The District-approved continuous monitors specified in part 6 shall be installed, calibrated, and operational prior to first firing of the Gas Turbines (S-1 & S-3) and Heat Recovery Steam Generators (S-2 & S-4). After first firing of the turbines, the detection range of these continuous emission monitors shall be adjusted as necessary to accurately measure the resulting range of CO and NO_x emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval. (9-9-501, BACT, Offsets)

8. The total number of firing hours of S-1 Gas Turbine and S-2 Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-1 SCR System and/or without abatement of carbon monoxide emissions by A-3 Oxidation Catalyst shall not exceed 300 hours during the commissioning period. Such operation of S-1 Gas Turbine and S-2 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 300 firing hours without abatement shall expire. (Offsets)

9. The total number of firing hours of S-3 Gas Turbine and S-4 Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-3 SCR System and/or without abatement of carbon monoxide emissions by A-4 Oxidation Catalyst shall not exceed 300 hours during the commissioning period. Such operation of S-3 Gas Turbine and S-4 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 300 firing hours without abatement shall expire. (Offsets)

10. The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM_{10}, and sulfur dioxide that are emitted by the Gas Turbines (S-1 & S-3) and Heat Recovery Steam Generators (S-2 & S-4) during the commissioning period shall accrue towards the consecutive twelve-month emission limitations specified in part 25, except that total, cumulative NO_x mass emissions from S-1, S-2, S-3, and S-4 shall not exceed ~~185~~ 150 tons during any consecutive twelve-month period which includes a portion of the Commissioning Period. (Offsets)

11. Combined pollutant mass emissions from the Gas Turbines (S-1 & S-3) and Heat Recovery Steam Generators (S-2 & S-4) shall not exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the Gas Turbines (S-1 & S-3).

NO_x (as NO_2)	4805 pounds per calendar day	381.2 pounds per hour
CO	~~11,498~~ 20,000 pounds per calendar day	~~930~~ 5000 pounds per hour
POC (as CH_4)	495 pounds per calendar day	
PM_{10}	468 pounds per calendar day	
SO_2	42 pounds per calendar day	

(PSD for NOx and CO)

12. Prior to the end of the Commissioning Period and not later than ~~120~~ 90 days after commencement of the commissioning period, the Owner/Operator shall conduct a District and CEC approved source test using external continuous emission monitors to determine compliance with part 21. The source test shall determine NO_x, CO, and POC emissions during start-up and shutdown of the gas turbines. The POC emissions shall be analyzed for methane and ethane to account for the presence of unburned natural gas. The source test shall include a minimum of three start-up and three shutdown periods. Twenty working days before the execution of the source tests, the Owner/Operator shall submit to the District and the CEC Compliance Program Manager (CPM) a detailed source test plan designed to satisfy the requirements of this condition. The District and the CEC CPM will notify the Owner/Operator of any necessary modifications to the plan within 20 working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CEC CPM comments into the test plan. The Owner/Operator shall notify the District and the CEC CPM within seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CEC CPM within ~~30~~ 60 days of the source testing date. (PSD for NOx and CO offsets)

Conditions for the Gas Turbines (S-1 & S-3) and the Heat Recovery Steam Generators (HRSGs; S-2 & S-4)

13. The Gas Turbines (S-1 and S-3) and HRSG Duct Burners (S-2 and S-4) shall be fired exclusively on natural gas with a maximum sulfur content of 1 grain per 100 standard cubic feet. (BACT for SO_2 and PM_{10})

14. The combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4) shall not exceed 2,124 MM BTU (HHV) per hour, averaged over any rolling 3-hour period. (PSD for NO_x)

15. The combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4) shall not exceed 49,908 MM BTU (HHV) per calendar day. (PSD for PM_{10})

16. The combined cumulative heat input rate for the Gas Turbines (S-1 & S-3) and the HRSGs (S-2 & S-4) shall not exceed 35,274,060 MM BTU (HHV) per year. (Offsets)

17. The HRSG duct burners (S-2 and S-4) shall not be fired unless its associated Gas Turbine (S-1 and S-3, respectively) is in operation. (BACT for NO_x)

18. S-1 Gas Turbine and S-2 HRSG shall be abated by the properly operated and properly maintained A-1 Selective Catalytic Reduction (SCR) System and A-3 Oxidation Catalyst whenever fuel is combusted at those sources and the A-1 catalyst bed has reached minimum operating temperature. (BACT for NO_x)

19. S-3 Gas Turbine and S-4 HRSG shall be abated by the properly operated and properly maintained A-2 Selective Catalytic Reduction (SCR) System and A-4 Oxidation Catalyst whenever fuel is combusted at those sources and the A-2 catalyst bed has reached minimum operating temperature. (BACT for NO_x)

20.The Gas Turbines (S-1 & S-3) and HRSGs (S-2 & S-4) shall comply with requirements (a) through (h) under all operating scenarios, including duct burner firing mode and steam injection power augmentation mode. Requirements (a) through (h) do not apply during a gas turbine start-up, a gas turbine ~~or~~ shutdown, a gas turbine cold start-up, or a combustor tuning period. (BACT, PSD, Toxic Risk Management Policy)

(a) Nitrogen oxide mass emissions (calculated as NO_2) at P-1 (the combined exhaust point for the S-1 Gas Turbine and the S-2 HRSG after abatement by A-1 SCR System) shall not exceed 19.2 pounds per hour or 0.00904 lb/MM BTU (HHV) of natural gas fired. Nitrogen oxide mass emissions (calculated as NO_2) at P-2 (the combined exhaust point for the S-3 Gas Turbine and the S-4 HRSG after abatement by A-3 SCR System) shall not exceed 19.2 pounds per hour or 0.00904 lb/MM BTU (HHV) of natural gas fired. (PSD for NO_x)

(b) The nitrogen oxide emission concentration at emission points P-1 and P-2 each shall not exceed 2.5 ppmv, on a dry basis, corrected to 15% O_2, averaged over any 1-hour period. (BACT for NO_x)

(e) Carbon monoxide mass emissions at P-1 and P-2 each shall not exceed 28.07 pounds per hour, averaged over any rolling 3-hour period. (PSD for CO)

(f) When the heat input to a combustion turbine exceeds 1700 MM BTU/hr (HHV), the carbon monoxide emission concentration at P-1 and P-2 each shall not exceed 6.0 ppmv, on a dry basis, corrected to 15% O_2, and the carbon monoxide mass emission rate at P-1 and P-2 each shall not exceed 0.0132 lb/MM BTU of natural gas fired, averaged over any rolling 3-hour period. If compliance source test results and continuous emission monitoring data indicate that a lower CO emission concentration level can be achieved on a consistent basis (with a suitable compliance margin subject to APCO review and approval) over the entire range of turbine operating conditions, including duct firing and power steam augmentation operations, and over the entire range of ambient conditions, the District will reduce this limit to a level not lower than 4.0 ppmv, on a dry basis, corrected to 15% O_2. If this limit is reduced, the corresponding mass emission rate limit specified in part 20(c) shall also be modified to reflect this reduction. (BACT for CO)

(i) Ammonia (NH_3) emission concentrations at P-1 and P-2 each shall not exceed 5 ppmv, on a dry basis, corrected to 15% O_2, averaged over any rolling 3-hour period. This ammonia emission concentration shall be verified by ~~the continuous recording of the ammonia injection rate to A-1 and A-2 SCR Systems~~ a District-approved ammonia slip calculation method. The ~~correlation between the gas turbine and HRSG heat input rates, A-1 and A-2 SCR System ammonia injection rates, and corresponding ammonia emission concentration at emission points P-1 and P-2~~ factors to be used in the calculation method shall be determined in accordance with permit condition 30. (TRMP for NH_3)

(j) Precursor organic compound (POC) mass emissions (as CH_4) at P-1 and P-2 each shall not exceed 2.7 pounds per hour or 0.00126 lb/MM BTU of natural gas fired. (BACT)

(k) Sulfur dioxide (SO_2) mass emissions at P-1 and P-2 each shall not exceed 1.28 pounds per hour or 0.0006 lb/MM BTU of natural gas fired. (BACT)

(l) Particulate matter (PM_{10}) mass emissions at P-1 and P-2 each shall not exceed 9 pounds per hour or 0.00452 lb PM_{10}/MM BTU of natural gas fired when HRSG duct burners are not in operation. Particulate matter (PM_{10}) mass emissions at P-1 and P-2 each shall not exceed 12 pounds per hour or 0.00565 lb PM_{10}/MM BTU of natural gas fired when HRSG duct burners are in operation. (BACT)

21. The regulated air pollutant mass emission rates from each of the Gas Turbines (S-1 and S-3) during a start-up, combustor tuning period, or a shutdown shall not exceed the limits established below. (PSD)

	Start-Up (lb/start-up)	~~Start-Up (lb/hr)~~	Start-up Or Combustor Tuning (lb/period)	Shutdown (lb/shutdown)
Oxides of Nitrogen (as NO_2)	240	~~80~~	480	~~18~~ 80
Carbon Monoxide (CO)	2,514	~~902~~	5,028	~~43.8~~ 902
Precursor Organic Compounds (as CH_4)	48	~~16~~	96	~~5~~ 16

22. Not more than one of ~~T~~the Gas Turbines (S-1 and S-3) shall ~~not~~ be in start-up mode or undergoing coumbustor tuning at any one time. ~~simultaneously~~. (PSD)

23. The heat recovery steam generators (S-2 & S-4) and associated ducting shall be designed and constructed such that an oxidation catalyst can be readily installed and properly operated if deemed necessary by the APCO to insure compliance with the CO emission rate limitations of parts 20(c) and 20(d). (BACT)

24. Total combined emissions from the Gas Turbines and HRSGs (S-1, S-2, S-3, and S-4), including emissions generated during Gas Turbine start-ups, gas turbine ~~and~~ shutdowns, and Gas Turbine combustor tuning activities shall not exceed the following limits during any calendar day:

(a)	1,362.6 pounds of NO_x (as NO_2) per day	(CEQA)
(b)	7,891.1 pounds of CO per day	(PSD)
(c)	230.2 pounds of POC (as CH_4) per day	(CEQA)
(d)	510 pounds of PM_{10} per day	(PSD)
(e)	57.9 pounds of SO_2 per day	(BACT)

25. Cumulative combined emissions from the Gas Turbines and HRSGs (S-1, S-2, S-3, and S-4), including emissions generated during gas turbine start-ups, gas turbine ~~and~~ shutdowns, and Gas Turbine combustor tuning activities shall not exceed the following limits during any consecutive twelve-month period:

(a)	123.4 tons of NO_x (as NO_2) per year	(Offsets)
(b)	588 tons of CO per year	(Cumulative Increase, PSD)
(c)	28 tons of POC (as CH_4) per year	(Offsets)
(d)	83.34 tons of PM_{10} per year	(Offsets)
(e)	10.6 tons of SO_2 per year	(Cumulative Increase)

26. The maximum projected annual toxic air contaminant emissions (per part 29) from the Gas Turbines and HRSGs combined (S-1, S-2, S-3, and S-4) shall not exceed the following limits:

formaldehyde	3,796 pounds per year
benzene	480 pounds of per year
Specified polycyclic aromatic hydrocarbons (PAHs)	22.8 pounds of per year

unless the following requirement is satisfied:

The owner/operator shall perform a health risk assessment using the emission rates determined by source test and the most current Bay Area Air Quality Management District approved procedures and unit risk factors in effect at the time of the analysis. This risk analysis shall be submitted to the District and the CEC CPM within 60 days of the source test date. The owner/operator may request that the District and the CEC CPM revise the carcinogenic compound emission limits specified above. If the owner/operator demonstrates to the satisfaction of the APCO that these revised emission limits will result in a cancer risk of not more than 1.0 in one million, the District and the CEC CPM may, at their discretion, adjust the carcinogenic compound emission limits listed above. (TRMP)

27. The owner/operator shall demonstrate compliance with parts 14 through 17, 20(a) through 20(d), 21, 22, 24(a), 24(b), 25(a), and 25(b) by using properly operated and maintained continuous monitors (during all hours of operation including equipment Start-up and Shutdown and combustor tuning periods) for all of the following parameters:

(a) Firing Hours and Fuel Flow Rates for each of the following sources: S-1 & S-2 combined and S-3 & S-4 combined.
(b) Oxygen (O_2) Concentrations, Nitrogen Oxides (NO_x) Concentrations, and Carbon Monoxide (CO) Concentrations at each of the following exhaust points: P-1 and P-2.
(e) Ammonia injection rate at A-1 and A-2 SCR Systems
(f) Steam injection rate at S-1 & S-3 Gas Turbine Combustors

The owner/operator shall record all of the above parameters every 15 minutes (excluding normal calibration periods) and shall summarize all of the above parameters for each clock hour. For each calendar day, the owner/operator shall calculate and record the total firing hours, the average hourly fuel flow rates, and pollutant emission concentrations.

The owner/operator shall use the parameters measured above and District-approved calculation methods to calculate the following parameters:
(e) Heat Input Rate for each of the following sources: S-1 & S-2 combined and S-3 & S-4 combined.
(f) Corrected NO_x concentrations, NO_x mass emissions (as NO_2), corrected CO concentrations, and CO mass emissions at each of the following exhaust points: P-1 and P-2.

For each source, source grouping, or exhaust point, the owner/operator shall record the parameters specified in parts 27(e) and 27(f) at least once every 15 minutes (excluding normal calibration periods). As specified below, the owner/operator shall calculate and record the following data:

(g) total Heat Input Rate for every clock hour and the average hourly Heat Input Rate for every rolling 3-hour period.
(h) on an hourly basis, the cumulative total Heat Input Rate for each calendar day for the following: each Gas Turbine and associated HRSG combined and all four sources (S-1, S-2, S-3, and S-4) combined.

(i) the average NO_x mass emissions (as NO_2), CO mass emissions, and corrected NO_x and CO emission concentrations for every clock hour and for every rolling 3-hour period.
(j) on an hourly basis, the cumulative total NO_x mass emissions (as NO_2) and the cumulative total CO mass emissions, for each calendar day for the following: each Gas Turbine and associated HRSG combined, and all four sources (S-1, S-2, S-3, and S-4) combined.
(k) For each calendar day, the average hourly Heat Input Rates, Corrected NO_x emission concentrations, NO_x mass emissions (as NO_2), corrected CO emission concentrations, and CO mass emissions for each Gas Turbine and associated HRSG combined.
(l) on a daily basis, the cumulative total NO_x mass emissions (as NO_2) and cumulative total CO mass emissions, for the previous consecutive twelve-month period for all four sources (S-1, S-2, S-3, and S-4) combined.

(1-520.1, 9-9-501, BACT, Offsets, NSPS, PSD, Cumulative Increase)

28. To demonstrate compliance with parts 20(f), 20(g), 20(h), 21, 24(c) through 24(e), and 25(c) through 25(e), the owner/operator shall calculate and record on a daily basis, the Precursor Organic Compound (POC) mass emissions, Fine Particulate Matter (PM_{10}) mass emissions (including condensable particulate matter), and Sulfur Dioxide (SO_2) mass emissions from each power train. The owner/operator shall use the actual Heat Input Rates calculated pursuant to part 27, actual Gas Turbine Start-up Times, actual Gas Turbine Shutdown Times, actual gas turbine combustor tuning times, and CEC and District-approved emission factors to calculate these emissions. The calculated emissions shall be presented as follows:

(a) For each calendar day, POC, PM_{10}, and SO_2 emissions shall be summarized for: each power train (Gas Turbine and its respective HRSG combined) and all four sources (S-1, S-2, S-3, and S-4) combined.
(b) on a daily basis, the cumulative total POC, PM_{10}, and SO_2 mass emissions, for each year for all four sources (S-1, S-2, S-3, and S-4) combined.

(Offsets, PSD, Cumulative Increase)

29. To demonstrate compliance with Part 26, the owner/operator shall calculate and record on an annual basis the maximum projected annual emissions of: Formaldehyde, Benzene, and Specified PAH's. Maximum projected annual emissions shall be calculated using the maximum Heat Input Rate of 35,274,060 MM BTU/year and the highest emission factor (pounds of pollutant per MM BTU of Heat Input) determined by any source test of the S-1 & S-3 Gas Turbines and/or S-2 & S-4 Heat Recovery Steam Generators. If the highest emission factor for a given pollutant occurs during minimum-load turbine operation, a reduced annual heat input rate may be utilized to calculate the maximum projected annual emissions to reflect the reduced heat input during gas turbine start-up and minimum-load operation. The reduced annual heat input rate shall be subject to the review and approval of the District. (TRMP)

30. Within ~~60~~ 90 days of start-up of the MEC, the owner/operator shall conduct a District-approved source test on exhaust point P-1 or P-2 to determine the ~~corrected ammonia (NH_3) emission concentration~~ establish the factors to be used to determine compliance with part 20(e). ~~The source test shall determine the correlation between the heat input rates of the gas turbine and associated HRSG, A-1 or A-2 SCR System ammonia injection rate, and the corresponding NH_3 emission concentration at emission point P-1 or P-2.~~ The source test shall be conducted over the expected operating range of the turbine and HRSG (including, but not limited to, minimum and full load, and steam injection power augmentation mode) to establish the ~~range of ammonia injection rates necessary to achieve NO_x emission reductions while maintaining~~ correction factors that will be used to calculate ammonia slip levels. This source testing shall be repeated on an annual basis thereafter. Continuing compliance with part 20(e) shall be demonstrated through calculations of corrected ammonia

concentrations based upon the ~~source test correlation and continuous records of ammonia injection rate~~ District-approved calculation method. (TRMP)

31. Within ~~60~~ 90 days of start-up of the MEC and on an annual basis thereafter, the owner/operator shall conduct a District-approved source test on exhaust points P-1 and P-2 while each Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum load (including steam injection power augmentation mode) to determine compliance with Parts 20(a), (b), (c), (d), (f), (g), and (h), while each Gas Turbine and associated Heat Recovery Steam Generator are operating at minimum load to determine compliance with Parts 20(c) and (d), and to verify the accuracy of the continuous emission monitors required in part 29. The owner/operator shall test for (as a minimum): water content, stack gas flow rate, oxygen concentration, precursor organic compound concentration and mass emissions, nitrogen oxide concentration and mass emissions (as NO_2), carbon monoxide concentration and mass emissions, sulfur dioxide concentration and mass emissions, methane, ethane, and particulate matter (PM_{10}) emissions including condensable particulate matter. (BACT, offsets)

32. The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section and the CEC CPM prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as specified in Volume V of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section and the CEC CPM in writing of the source test protocols and projected test dates at least 7 days prior to the testing date(s). As indicated above, the Owner/Operator shall measure the contribution of condensable PM (back half) to the total PM_{10} emissions. However, the Owner/Operator may propose alternative measuring techniques to measure condensable PM such as the use of a dilution tunnel or other appropriate method used to capture semi-volatile organic compounds. Source test results shall be submitted to the District and the CEC CPM within 60 days of conducting the tests. (BACT)

33. Within ~~60~~ 90 days of start-up of the MEC and on a~~n~~ biennial basis (once every two years) thereafter, the owner/operator shall conduct a District-approved source test on exhaust point P-1 or P-2 while the Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum allowable operating rates to demonstrate compliance with Part 26. The gas turbine shall also be tested at minimum load. If three consecutive biennial source tests demonstrate that the annual emission rates calculated pursuant to part 29 for any of the compounds listed below are less than the BAAQMD Toxic Risk Management Policy trigger levels shown, then the owner/operator may discontinue future testing for that pollutant:

Benzene	≤	26.8 pounds/year
Formaldehyde	≤	132 pounds/year
Specified PAH's	≤	0.18 pounds/year

(TRMP)

34. The owner/operator of the MEC shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, and equipment breakdown reports) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual. Data from any source test required by this permit shall be submitted to the District within 30 days of the testing date, unless otherwise indicated. (Regulation 2-6-502)

35. The owner/operator of the MEC shall maintain all records and reports on site for a minimum of 5 years. These records shall include but are not limited to: continuous monitoring records

(firing hours, fuel flows, emission rates, monitor excesses, and breakdowns), source test and analytical records, natural gas sulfur content analysis results, emission calculation records, records of plant upsets and related incidents. The owner/operator shall make all records and reports available to District and the CEC CPM staff upon request. (Regulation 2-6-501)

36. The owner/operator of the MEC shall notify the District and the CEC CPM of any violations of these permit conditions. Notification shall be submitted in a timely manner, in accordance with all applicable District Rules, Regulations, and the Manual of Procedures. Notwithstanding the notification and reporting requirements given in any District Rule, Regulation, or the Manual of Procedures, the owner/operator shall submit written notification (facsimile is acceptable) to the Enforcement Division within 96 hours of the violation of any permit condition. (Regulation 2-1-403)

37. The stack height of emission points P-1 and P-2 shall each be at least 145 feet above grade level at the stack base. (PSD, TRMP)

38. The Owner/Operator of MEC shall provide adequate stack sampling ports and platforms to enable the performance of source testing. The location and configuration of the stack sampling ports shall be subject to BAAQMD review and approval. (Regulation 1-501)

39. Within 180 days of the issuance of the Authority to Construct for the MEC, the Owner/Operator shall contact the BAAQMD Technical Services Division regarding requirements for the continuous emission monitors, sampling ports, platforms, and source tests required by parts 27, 30, 31, 33, and 47.
All source testing and monitoring shall be conducted in accordance with the BAAQMD Manual of Procedures. (Regulation 1-501)

40. Prior to the issuance of the BAAQMD Authority to Construct for the Metcalf Energy Center, the Owner/Operator shall demonstrate that valid emission reduction credits in the amount of ~~212.75~~ 172.5 tons/year of Nitrogen Oxides and 28 tons/year of Precursor Organic Compounds or equivalent (as defined by District Regulations 2-2-302.1 and 2-2-302.2) are under their control through enforceable contracts, option to purchase agreements, or equivalent binding legal documents. (Offsets)

41. Prior to the start of construction of the Metcalf Energy Center, the Owner/Operator shall provide to the District valid emission reduction credit banking certificates in the amount of 212.75 tons/year of Nitrogen Oxides and 28 tons/year of Precursor Organic Compounds or equivalent as defined by District Regulations 2-2-302.1 and 2-2-302.2. (Offsets, CEC)

42. Pursuant to BAAQMD Regulation 2, Rule 6, section 404.1, the owner/operator of the MEC shall submit an application to the BAAQMD for a major facility review permit within 12 months of the issuance of the PSD permit for the MEC. (Regulation 2-6-404.1)

43. Pursuant to 40 CFR Part 72.30(b)(2)(ii) of the Federal Acid Rain Program, the owner/operator of the Metcalf Energy Center shall submit an application for a Title IV operating permit to the BAAQMD. Operation of any of the gas turbines (S-1 & S-3) or HRSGs (S-2 & S-4) without a Title IV operating permit may not occur sooner than 24 months after the application is received by the BAAQMD. (Regulation 2, Rule 7)

44. The owner/operator shall comply with the continuous emission monitoring requirements of 40 CFR Part 75. (Regulation 2, Rule 7)

45. The owner/operator shall take monthly samples of the natural gas combusted at the MEC. The samples shall be analyzed for sulfur content using District-approved laboratory methods. The sulfur content test results shall be retained on site for a minimum of five

years from the test date and shall be utilized to satisfy the requirements of 40 CFR Part 60, subpart GG. (cumulative increase)

46. The owner/operator shall properly install the cooling towers and shall maintain them to minimize drift losses. The cooling towers shall be equipped with high-efficiency mist eliminators with a maximum guaranteed drift rate of 0.0005%. The maximum total dissolved solids (TDS) measured at the base of the cooling towers or at the point of return to the wastewater facility shall not be higher than 5,438 ppmw (mg/l). The owner/operator shall sample the water at least once per day. (PSD)

47. The owner/operator shall perform a visual inspection of the cooling tower drift eliminators at least once per calendar year, and repair or replace any drift eliminator components which are broken or missing. Prior to the initial operation of the Metcalf Energy Center, the owner/operator shall have the cooling tower vendor's field representative inspect the cooling tower drift eliminators and certify that the installation was performed in a satisfactory manner. Within ~~60~~ 90 days of the initial operation of the cooling tower, the owner/operator shall perform an initial performance source test to determine the PM_{10} emission rate from the cooling tower to verify compliance with the vendor-guaranteed drift rate specified in part 46. The CPM may, in years 5 and 15 of cooling tower operation, require the owner/operator to perform source tests to verify continued compliance with the vendor-guaranteed drift rate specified in part 46. (PSD)

48. The total number of hours during which the Gas Turbines (S-1 and S-3) may be operated in cold start-up mode or may undergo combustor tuning shall not exceed 30 hours per year for each gas turbine. (cumulative increase)

49. To demonstrate compliance with condition 48, the owner/operator shall record the start time, end time, and duration of each gas turbine cold start-up and each combustor tuning period. On an annual basis, the owner/operator shall record the total number of hours during which each gas turbine (S-1 and S-3) operated in cold start-up mode or combustor tuning mode for each calendar year. (cumulative increase)

RECOMMENDATION

Issue a **Change of Conditions Letter** for the following sources:

S-1 Combustion Gas Turbine #1, Westinghouse 501FD; 1,990.5 MM BTU per hour, equipped with dry low-NO_x Combustors, abated by A-1 Selective Catalytic Reduction System and A-3 Oxidation Catalyst

S-3 Combustion Gas Turbine #2, Westinghouse 501FD; 1,990.5 MM BTU per hour, equipped with dry low-NO_x Combustors, abated by A-2 Selective Catalytic Reduction System and A-4 Oxidation Catalyst

Issue a **Banking Certificate** in the amount of 40.25 tons per year of POC to Calpine Corporation (originally from certificate 743).

___Dennis Jang _ **_____March 30, 2005**

Air Quality Engineer II **Date**

Appendix A

Summary of PSD Air Quality Impact Analysis

SUMMARY OF AIR QUALITY IMPACT ANALYSIS FOR THE METCALF ENERGY CENTER PROPOSED PERMIT CHANGES

January 11, 2005

BACKGROUND

Calpine Corporation and Bechtel Enterprises Holdings, Inc. originally submitted a permit application (# 27215) for a proposed 600-MW combined cycle power plant, the Metcalf Energy Center in February 2000. The facility is to be composed of two natural gas-fired turbines with heat recovery steam generators, one steam turbine and supplemental burners (duct burners), a cooling tower, plus an emergency generator and fire pump engine. An air quality modeling impact analysis was performed for the facility in April 2000 and it was determined that the air quality impacts from the proposed project would not interfere with the attainment or maintenance of applicable ambient air quality standards for NO_2, CO and PM_{10}. Based on operating experience at other facilities, the owners, now the Metcalf Energy Center, LLC, have requested changes in the permit related to turbine/heat recovery steam generator commissioning, cold steam turbine startup and gas turbine tuning. The requested changes, as outlined in the November 2004 permit application and the December 23, 2004 revised modeling analysis, apply only to the short term CO and NO_2 emission rates during commissioning and startup. The applicant is not proposing to change any of the previously permitted daily or long-term annual emission limits. As a result, only impacts for criteria pollutants with short term averages, one- and eight-hour CO and one-hour NO_2 concentrations, are presented.

AIR QUALITY IMPACT ANALYSIS SUMMARY

The required contents of an air quality impact analysis are specified in Section 414 of Regulation 2 Rule 2. According to subsection 414.1, if the maximum air quality impacts of a new or modified stationary source do not exceed significant levels for air quality impacts, as defined in Section 2-2-233, no further analysis is required. (Consistent with EPA regulations, it is assumed that emission increases will not interfere with the attainment or maintenance of AAQS, or cause an exceedance of a PSD increment if the resulting maximum air quality impacts are less than specified significant levels). If the maximum impact for a particular pollutant is predicted to exceed the significant impact level, a full impact analysis is required involving estimation of background pollutant concentrations and, if applicable, a PSD increment consumption analysis.

Air Quality Modeling Methodology

Maximum ambient concentrations of NO_x and CO were estimated for various plume dispersion scenarios using established modeling procedures. The plume dispersion scenarios addressed include simple terrain impacts (for receptors located below stack height), complex terrain

impacts (for receptors located at or above stack height), impacts due to building downwash, and impacts due to inversion breakup. Because the facility is not within 3 km of a shoreline of a large body of water, shoreline fumigations impacts were not modeled.

Emissions from the turbines will be exhausted from two 145 foot exhaust stacks. The project also includes a cooling tower (comprised of 10 cells) with a release height of 64 feet. Table II contains the emission rates used in the turbine commissioning and turbine startup modeling scenarios. Commissioning is the original startup of the turbines and only occurs during the initial operation of the equipment after installation. It is assumed both turbines are being commissioned simultaneously with each emitting half of the allowable emissions during the averaging period. During turbine startup for the one-hour averaging period, only one gas turbine will be in startup mode at a time, and only one gas turbine will be supporting a steam turbine cold startup or gas combustor tuning operation at a time. For the eight-hour averaging period, one turbine initiates a six-hour steam turbine cold startup or gas turbine combustor tuning period at the beginning of the eight-hour period and the second turbine initiates a warm startup or combustor tuning period during the last two hours of the eight-hour period.

The applicant used the EPA model ISCST3. The model was run using 1993 meteorological data collected by IBM at its facility about three miles northwest of the proposed project site. Because the exhaust stacks are less than Good Engineering Practice (GEP) stack height, ambient impacts due to building downwash were evaluated. Because complex terrain was located nearby, complex terrain impacts were considered. The Ozone Limiting Method was used to convert one-hour NO_x impacts into one-hour NO_2 impacts.

Table II
Averaging period emission rates used in modeling analysis (g/s)

	Commissioning[1]		Startup[2]	
Pollutant Source	(1-hour)	(8-hour)	(1-hour)	(8-hour)
NO_x				
Turbine 1	24.02	n/a	60.48	n/a
Turbine 2	24.02		2.42	
Fire Pump				
Emergency Generator				
Cooling Tower				
CO				
Turbine 1	315.0	39.37	633.53	80.08
Turbine 2	315.0	39.38	3.54	14.21
Fire Pump				
Emergency Generator				0.05
Cooling Tower				

[1]Commissioning is the original startup of the turbines and only occurs during the initial operation of the equipment after installation. [2]Startup is the beginning of any of the subsequent duty cycles to bring one turbine from idle status up to power production.

Air Quality Modeling Results

The maximum predicted ambient impacts of the various modeling procedures described above are summarized in Table III for the averaging periods for which AAQS and PSD increments have been set.

Also shown in Table III are the corresponding significant ambient impact levels listed in Section 233 of the District's NSR Rule. In accordance with Regulation 2-2-414 further analysis is required for the one-hour NO_2 and the one-hour CO modeled impacts. Further analysis is not required for the eight-hour averaged CO modeled impacts.

TABLE III
Maximum predicted ambient impacts of proposed project ($\mu g/m^3$)
[Overall maximum in bold type]

Pollutant	Averaging Time	Commissioning Maximum Impact	Startup Maximum Impact	Significant Air Quality Impact Level
NO_2	1-hour	193	188	19
CO	1-hour	11,073	10,882	2000
	8-hour	483	495	500

Background Air Quality Levels

Regulation 2-2-111 of the NSR rule entitled PSD monitoring exemption, exempts an applicant from the requirement of monitoring background concentrations in the impact area (section 414.3) provided the impacts from the proposed project are less than specified levels. Table IV lists the applicable exemption standards and the maximum impacts from the proposed facility. As shown, all modeled impacts are below the preconstruction monitoring threshold.

TABLE IV
PSD monitoring exemption levels and maximum impacts
from the proposed project for NO_2 and CO ($\mu g/m^3$)

Pollutant	Averaging Time	Exemption Level	Maximum Impacts from Proposed Project
CO	8-hour	575	495

The District-operated San Jose 4th Street Monitoring Station was chosen as representative of the background CO and NO_2 concentrations. Table V contains the concentrations measured at the three sites for the past 5 years (1999 through 2003).

TABLE V
Background NO_2 and CO concentrations ($\mu g/m^3$) at San Jose 4th Street Monitoring for the past five years (maximums are outlined)

	NO_2	CO
Year	Highest 1-hour average	Highest 1-hour average
1999	249	10,267
2000	211	9,800
2001	211	8,867
2002	153	6,183
2003	173	6417

Table VI contains the comparison of the ambient standards with the proposed project impacts added to the maximum background concentrations. The National and California ambient NO_2 and CO standards are not exceeded from the proposed project. Therefore, in accordance with subsection 414.1, only a visibility, soils and vegetation impact analysis is further required.

TABLE VI
California and national ambient air quality standards and ambient air quality levels from the proposed ($\mu g/m^3$)

Pollutant	Averaging Time	Maximum Background	Maximum Project impact	Maximum Project impact plus maximum background	California Standards	National Standards
NO_2	1-hour	249	193	442	470	---
CO	1-hour	10,267	11,073	21,340	23,000	40,000

VISIBILITY, SOILS AND VEGETATION IMPACT ANALYSIS

Visibility impacts were assessed using EPA's VISCREEN visibility screening model. The analysis shows that the proposed project will not cause any impairment of visibility at Pinnacles National Monument or Point Reyes National Seashore, the two nearest Class I areas.

Vegetation and soils in the project study area were inventoried. Maximum project NO_2 and CO concentrations will not result in significant soil and/or vegetation impacts.

CONCLUSIONS

The results of the air quality impact analysis indicate that the proposed project would not interfere with the attainment or maintenance of applicable AAQS for NO_2, and CO. The applicant's analysis was based on EPA approved models and calculation procedures and was performed in accordance with Section 414 of the District's NSR Rule.

ENGINEERING EVALUATION REPORT
Metcalf Energy Center LLC
PLANT NUMBER 12183
APPLICATION NUMBER 16512

I. BACKGROUND

Metcalf Energy Center, LLC (Metcalf) is proposing to increase the water circulation rate at source S-5 Cooling Tower, from 8 millions gallons per hour to 9 millions gallons per hour. S-5 serves the Metcalf Energy Center, a 600 MW natural gas fired combined cycle plant located in San Jose. This plant consists of two combined cycle turbines that started operation in March of 2005.

The increase in the water rate will result in an emissions increase of PM_{10} and associated TACs. The applicant has submitted revised results for the HRA and the PM10 modeling assessment that were reviewed by the District Toxics Evaluation Section (Toxics). In addition, Toxics conducted its own HRA and the results are summarized below.

Metcalf has applied for a modification to:

S-5 Cooling Tower, 10-Cell, 8,000,000 gallons per hour circulation rate

II. EMISSION CALCULATIONS

Cooling tower circulation rate:	150,000 gpm (133,378 gpm current)
Evaporation rate:	3,704 gpm
maximum total dissolved solids:	5438 ppmw
Drift Rate:	0.0005%

Mass Rate = (150,000 – 133,378 gal/min)(8.34 lb/gal)(60 min/hr) = 8,317,648.8 lb/hr

PM_{10} = (5438 ppmw)/(10^6) X 8,317,648.8 lb/hr X 5E-6 = 0.23 lb/hr **increase**
= 5.43 lb/day (24 hr/day operation)
= 1981.1 lb/yr (8,760 operating hours per year)
= 0.99 ton/yr

III. CUMULATIVE EMISSIONS

Pollutant	Existing (ton/yr)	Offsets (ton)	Increase (ton/yr)	New (ton/yr)
PM_{10}	91.302	91.30	0.99	0.992
SO_2	10.602		0	10.602
NO_x	123.464	123.464	0	0
CO	588.024		0	588.024
POC	28.010	28.01	0	28.010
NPOC	0		0	0

IV. TOXIC RISK SCREENING ANALYSIS

Toxic Emissions are calculated as follows:

TAC	Maximum Concentraion	Emissions			
	(ppm)	(lb/hr)	(lb/day)	(lb/yr)	(ton/yr)
Ammonia	5.5	2.06E-03	4.95E-02	1.81E+01	9.04E-03
Arsenic	0.007	2.63E-06	6.31E-05	2.30E-02	1.15E-05
Cadmium	0.005	1.88E-06	4.50E-05	1.64E-02	8.22E-06
Chromium III	0.003	1.13E-06	2.70E-05	9.86E-03	4.93E-06
Copper	0.021	7.88E-06	1.89E-04	6.90E-02	3.45E-05
Lead	0.055	2.06E-05	4.95E-04	1.81E-01	9.04E-05
Mercury	0.00045	1.69E-07	4.05E-06	1.48E-03	7.40E-07
Nickel	0.0385	1.44E-05	3.47E-04	1.27E-01	6.33E-05
Silver	0.005	1.88E-06	4.50E-05	1.64E-02	8.22E-06
Zinc	0.245	9.19E-05	2.21E-03	8.05E-01	4.03E-04

Per the attached December 10, 2008 memo from Glen Long, results from the health risk screening analysis indicate that the cancer risk for the maximally exposed non-residential receptor is 0.01 in a million and for the maximally exposed residential receptor is 0.03 in a million. The hazard index for the non-residential receptor is 0.0001 and for the residential receptor is 0.0003. In accordance with Regulation 2-5, the risk level is acceptable.

Receptor	*Cancer Risk*	*Chronic Non-cancer Hazard Index*
Resident	***0.03 chances in a million***	***0.0003 chances in a million***
Worker	***0.01 chances in a million***	***0.0001 chances in a million***

Acute Hazard Index	0.00055

The ISCST3 air dispersion computer model was used to estimate annual average ambient air concentrations. Stack and building parameters for the analysis were based on information provided by the applicant.

IV. APPLICABLE REQUIREMENTS

A. Regulation 2

1. PSD Requirements (2-2-304)

   The increase in PM_{10} emissions is less than 15 tons/yr and therefore does not require a PSD analysis pursuant to Regulation 2-2-304.3.

2. Offset Requirements (2-2-303)

   Because the total PM_{10} emissions do not exceed 100 tons per year, the modification to S-5 does not trigger the PM_{10} offset requirement of District Regulation 2-2-303.

It should be noted however, that the CEC (California Energy Commission) required mitigation of the PM_{10} emissions at the time the project was certified. Calpine surrendered PM_{10} and POC offset credits to mitigate 91.3 tons of PM_{10}. The District will notify CEC that the increase in recirculation rate will increase the PM_{10} emissions by 1 ton.

3. BACT (2-2-301)

   S-5 Cooling Tower emits greater than 10 pounds per day of PM_{10} emissions and therefore triggers BACT. The BAAQMD BACT/TBACT workbook does not specify BACT for PM_{10} for wet cooling towers. However, the ARB BACT Clearinghouse cites a BACT specification for PM_{10} for the proposed La Paloma power plant cooling tower as the use of drift eliminators with a maximum drift rate of 0.0006%. S-5 is equipped with drift eliminators with a drift rate of 0.0005%. This meets BACT for PM_{10}.

4. Notification (2-1-412)

   The project is not located within 1000 feet from a school. The project is not subject to the public notification requirements of Reg. 2-1-412.

B. CEQA

The California Energy Commission (CEC), as the lead agency under CEQA for the Metcalf Project, satisfied the CEQA requirements of Regulation 2-1-426.2.1 by issuing their Final Certification that serves as an EIR-equivalent. The applicant has notified CEC of the proposed modification to S-5. The CEC has requested notification from the District of its action on this application.

C. Regulation 6: Particulate Matter and Visible Emissions

Source S-5 is expected to comply with Regulation 6, including sections 301 (Ringelmann No. 1 Limitation), 302 (Opacity Limitation) with visible emissions not to exceed 20% opacity, and 310 (Particulate Weight Limitation) with particulate matter emissions of less than 0.15 grains per dry standard cubic foot of exhaust gas volume.

D. Regulation 7: Odorous Substances

Regulation 7-302 prohibits the discharge of odorous substances which remain odorous beyond the facility property line after dilution with four parts odor-free air. The modification to S-5 is not expected to change the compliance status with this requirement.

V. PERMIT CONDITIONS

Permit Condition #18310, Part 46 limit the maximum total dissolved solids and the drift rate for S-5. There is no limit on the circulation rate of the cooling water. Furthermore, Part 25 limit maximum annual cumulative PM10 emissions from the combustion sources only. Therefore, no condition changes to permit conditions are required. However, the source description will be changed to reflect the new circulation rate.

VI. RECOMMENDATIONS

It is recommended that S-5 be modified as follows:

S-5 Cooling Tower, 10-Cell, 9,000,000 gallons per hour circulation rate

VII. EXEMPTIONS

None

By: _____ Date: _____

ENGINEERING EVALUATION
Metcalf Energy Center
PLANT NO. 12183
APPLICATION NO. 12560

BACKGROUND

Metcalf Energy Center of Oakland, California has applied for a permit to operate an existing standby generator powered by a diesel engine (S-7). The engine has been in operation since 5/1999 and was thus installed before 5/17/2000 when Regulation 1 and Regulation 2-1 were modified to require engines greater than 50 HP to require a Permit to Operate. As such, S-7 constitutes a Loss-Of-Exemption source not subject to Regulations 2-1-301 or 2-1-302 ("new" and "modified sources").

S-7 Stationary Standby Generator Set: Diesel Engine; Make: John Deere; Model: 6081; Rated Horsepower: 360 HP

The standby generator is located at 1 Blanchard Road, San Jose, California 95013.

EMISSIONS

Emissions from S-7 do not need to be calculated since S-7 is not defined as a new or modified source.

CUMULATIVE INCREASE

Emissions from S-7 do not count towards the facility's cumulative increase since S-7 is not defined as a new or modified source pursuant to Regulation 2-1.

BACT

Since S-7 is a loss-of-exemption source, it is not subject to BACT requirements pursuant to Regulation 2-2.

OFFSETS

Offsets are not required because S-7 is not a new or modified source pursuant to Regulation 2-1 and 2-2.

TOXIC RISK SCREEN ANALYSIS

A Toxic Risk Screen Analysis is not required for this source since S-7 is not a new or modified source and is not subject to Regulation 2-1-316.

STATEMENT OF COMPLIANCE

S-7 will be operated as an emergency standby engine and therefore is not subject to the emission rate limits in Regulation 9, Rule 8 ("NOx and CO from Stationary Internal Combustion Engines"). S-7 is subject to the monitoring and record keeping requirements of Regulation 9-8-530 and the SO2 limitations of 9-1-301 (ground-level concentration) and 9-1-304 (0.5% by weight in fuel). Regulation 9-8-530 requirements are incorporated into the proposed permit conditions. Compliance with Regulation 9-1 is very likely since all California diesel fuel contains less than 0.05% sulfur by weight. Like all combustion sources, S-7 is subject to Regulation 6 ("Particulate and Visible Emissions"). This engine is not expected to produce visible emissions or fallout in violation of this regulation and will be assumed to be in compliance with Regulation 6 pending a regular inspection.

This diesel engine is subject to the Stationary Diesel Airborne Toxics Control Measure (ATCM) and is considered an in-use stationary emergency standby diesel engine since it was installed before January 1, 2005 and is larger than 50 HP. The requirements of the ATCM will be included in the permit conditions.

This application is considered to be ministerial under the District's proposed CEQA guidelines (Regulation 2-1-311) and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors in accordance with Permit Handbook Chapter 2.3.

This source is not defined as a new or modified source and is therefore not subject to the public notification requirements of Regulation 2-1-412.

A toxic risk screening analysis is not required.

BACT, PSD, NSPS, and NESHAPS are not triggered.

PERMIT CONDITIONS

APPLICATION 12560; Metcalf Energy Center; PLANT 12183; CONDITIONS FOR S-7:

PC 21911

1. Hours of Operation: The owner/operator shall operate the emergency standby engine(s) only to mitigate emergency conditions or for reliability-related activities. Operating while mitigating emergency conditions is unlimited. Operating for reliability-related activities is limited to 50 hours per any calendar year.
   [Basis: Regulation 9-8-330]

   "Emergency Conditions" is defined as any of the following:
   a. Loss of regular natural gas supply.
   b. Failure of regular electric power supply.
   c. Flood mitigation.
   d. Sewage overflow mitigation.

e. Fire.
f. Failure of a primary motor, but only for such time as needed to repair or replace the primary motor.

[Basis: Regulation 9-8-231]

"Reliability-related activities" is defined as any of the following:
a. Operation of an emergency standby engine to test its ability to perform for an emergency use, or
b. Operation of an emergency standby engine during maintenance of a primary motor.

[Basis: Regulation 9-8-232]

2. The owner/operator shall equip the emergency standby engine(s) with either:
   a. a non-resettable totalizing meter that measures the hours of operation for the engine; or
   b. a non-resettable fuel usage meter, the maximum hourly fuel rate shall be used to convert fuel usage to hours of operation.

   [Basis: Regulation 9-8-530]

3. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 2 years and shall make the log available for District inspection upon request:
   a. Hours of operation (total).
   b. Hours of operation (emergency).
   c. For each emergency, the nature of the emergency condition.
   d. Fuel usage for engine(s) if a non-resettable fuel usage meter is utilized.

   [Basis: Regulations 9-8-530 and 1-441]

RECOMMENDATION

Waive Authority to Construct and issue a Permit to Operate to Metcalf Energy Center for:

S-7 Stationary Standby Generator Set: Diesel Engine; Make: John Deere; Model: 6081; Rated Horsepower: 360 HP

BY: _____

Raymond Salalila Date
Air Quality Engineering Intern
Engineering Division