

METCALF ENERGY CENTER (99-AFC-3C)
Amendment 1 - Petition to Amend Air Quality Conditions
Air Quality Staff Analysis
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Amendment Request

On November 17, 2004, Metcalf Energy Center LLC (MEC, LLC or project owner) proposed an amendment (Amendment 1) to the Metcalf Energy Center (MEC) Project (MEC 2004). This amendment request seeks to amend Conditions of Certification (CoC) for the cold steam turbine startup, routine gas turbine startup and shutdown, gas turbine tuning, and commissioning operations based on recent experience at other, similar gas turbine power plants. Additionally, the first year's annual nitrogen oxides (NO_x) emission limit and corresponding offset requirement are requested to be lowered, various source testing and other regulatory reporting due dates are requested to be revised, the ammonia slip calculation methodology has been requested to be revised, new and revised permit definitions have been provided, and a few editorial corrections within the conditions and/or verifications have been requested. As a result, staff's air quality analysis has been revised, several of the CoCs have been revised, permit definitions have been revised and added, and two CoCs have been added.

The project owner is requesting revisions to the CoC definitions, as well as the following conditions: **AQ-1, AQ-10 to AQ-13, AQ-16, AQ-20 to AQ-22, AQ-24, AQ-25, AQ-27, AQ-28, AQ-30, AQ-31, AQ-33, AQ-34, AQ-40, AQ-41, AQ-46, and AQ-47**. Two new conditions (**AQ-56 and AQ-57**) were proposed to be added by the project owner as a result of the requested inclusion and new emission limits for cold startups and gas turbine tuning operations.

Analysis Conclusion

Staff's review of the requested amendment has determined that the requested revisions to the definitions and conditions are prudent and would not cause any significant air quality impacts or revise staff's original finding that the project impacts are properly mitigated. The amendment does not request any revisions to the project's particulate matter (PM₁₀ and PM_{2.5}) and sulfur dioxide (SO₂) emissions, and the amended project emissions would not cause exceedances of attainment pollutants (CO and NO₂) or significantly contribute to exceedances of ozone. Additionally, the amendment does not increase the post commissioning daily or annual emission limits for the facility; which can be maintained by proper startup sequencing and through the expected lower than permitted normal operating emissions, and the daily and annual emission limits will be verified by the Continuous Emission Monitors (CEMs) and the annual source tests. Finally, the amended project's non-attainment pollutants remain fully offset through compliance with the existing and amended CoCs.

Staff has also reviewed and, as necessary, incorporated condition revisions proposed in an internal draft of the Preliminary Determination of Compliance (PDOC) conditions prepared by the Bay Area Air Quality Management District (BAAQMD). Staff

recommends that the revised definitions and CoCs be approved as shown below, including the minor editorial changes that have been proposed by staff or by BAAQMD.

Background

In April 1999, MEC, LLC proposed to construct and operate a 600 megawatt (MW) combined cycle power plant in southern San Jose, Santa Clara County, approximately one-half mile west of the Pacific Gas and Electric Company Metcalf substation. The MEC Project was certified on September 24, 2001 (CEC 2001). MEC, LLC expects to initiate commissioning activities at the MEC in March 2005, and begin commercial operation by early summer of 2005.

Based on experience gained during the commissioning and operation of Calpine's other, similar gas turbine power plants, MEC, LLC identified several necessary permit condition changes related to turbine/heat recovery steam generator (HRSG) commissioning, cold steam turbine startup, and gas turbine combustor tuning events. This experience leads MEC, LLC to believe that the facility will violate the existing short-term commissioning, startup and shutdown emission limits. The other requested revisions are more procedural and would not have the potential to cause air quality impacts.

Laws, Ordinances, Regulations, and Standards

LORS identified in the Energy Commission decision for the MEC Project also apply to this amendment request. The project would continue to remain in compliance with all applicable LORS with the requested changes. Specific LORS compliance issues for each amendment request are discussed in the separate analyses as appropriate.

Setting

Existing Ambient Air Quality

The MEC Project is located in southern San Jose and there are currently no state or Federal certified ambient air quality monitoring stations near the project site. For the purposes of the air quality impact analysis the highest background at the Central San Jose monitoring stations between 2000 and 2003 was selected. Staff believes that this is a reasonably conservative approach for the nitrogen dioxide (NO₂) background at the site, but likely overstates the carbon monoxide (CO) background conditions at the site due to the location and date of the background concentrations being used. Central San Jose routinely has the highest monitored CO concentrations within the San Francisco Bay Area, and the use of 2000 data for the background neglects the considerable reduction in the concentrations in Central San Jose over the past four years. While staff has not revised the background ambient air quality concentrations used by the project owner in its air quality modeling analysis, we do note that we consider the CO background values to be overly conservative for the project site.

The project owner is currently monitoring ambient air quality near the project site. However, this monitoring station has only been operational since November 2004 and

equipment and data quality checks have not been completed. Therefore, no data from that station was provided to the CEC for review.

Project Description Changes

MEC, LLC is requesting the following changes to the existing permit conditions related to startup, shutdown, turbine combustor tuning, and commissioning:

- Eliminate the current hourly limits on NO_x, CO, and (precursor organic compound (POC) emissions during startup, while retaining the overall emissions limits for the three-hour startup periods;
- Increase the NO_x, CO and POC emission limits during shutdowns;
- Add new definitions for cold startup and combustor tuning periods, with durations of six hours per period;
- Add new NO_x, CO, and POC mass emission limits (480 lb/period, 5,028 lb/period, and 96 lb/period, respectively) that will apply during steam turbine cold startup and gas turbine combustor tuning periods;
- Change the current CO limits during commissioning from 930 lb/hr to 5,000 lb/hr and from 11,498 lb/day to 20,000 lb/day;
- Reduce the allowable total NO_x emissions during the first year of project operation from 185 to 150 tons.

MEC, LLC is not proposing to increase any of the post-commissioning twelve month period daily or twelve-month period emission limits for the MEC Project. MEC, LLC is also proposing to add definitions and add new record keeping requirements that will apply during cold startup and gas turbine combustor tuning.

Analysis

The analysis has been divided into three specific topics:

- 1) Commissioning Related Requests
- 2) Startup, Shutdown, and Combustor Tuning
- 3) Miscellaneous Requested Revisions to the CoCs

Commissioning Related Requests

Commissioning - Annual NO_x Emission Revision

Calpine has developed procedures that will reduce the number of fired commissioning hours prior to adding pollution controls, and expects to use those procedures to lower the overall commissioning period emissions. Due to this anticipated reduction in uncontrolled operating hours during commissioning MEC, LLC is proposing to reduce the allowable NO_x emissions from the facility during the first twelve months of operation from 185 tons to 150 tons (CoC **AQ-10**) and proposing to reduce the required corresponding emission offsets, using the 1 to 1.15 offset ratio, from 212.75 to 172.5 tons (CoCs **AQ-40** and **AQ-41**). This revision to the first year NO_x ERC requirement is calculated as follows: 150 tons NO_x emissions x 1.15 offset ratio = 172.5 tons NO_x ERCs.

The identified change in the commissioning procedures is to conduct an air blow rather than a steam blow to clean out the steam piping prior to steam being sent through the steam turbine. This change in procedure means that the steam does not have to be produced during this commissioning event, lowering the number of commissioning hours needed before the installation of control equipment. While Calpine has committed to using this procedure, they have withdrawn their original request to conditionally (**AQ-8** and **AQ-9**) reduce the maximum operating hours prior to the installation/operation of the NOx reduction catalyst controls (MEC 2005, Data Response 2-5). Since the NOx emissions will be monitored throughout the commissioning and subsequent operation, compliance with the NOx limit will be able to be demonstrated and any risk of having to curtail operations to maintain the revised limit will lie with the project owner. Therefore, staff recommends acceptance of the requested changes to CoCs **AQ-10** and **AQ-40**. However, the requested revision to CoC **AQ-41** is not recommended since that condition requiring that the ERCs be provided prior to construction has been complied with and which has lapsed.

Commissioning - Definitions

MEC, LLC is proposing to include “air pollution control systems” in the list of equipment that is included in the definition of commissioning activities, and to add the word “successfully” to the commissioning period definition to note that the end of commissioning period is defined in part after the performance testing has been successfully completed. Staff recommends acceptance of these revisions to the definitions that precede the CoCs.

Commissioning - Hourly and Daily Emission Limits

Emissions Evaluation

Calpine’s experience from other, similar gas turbine power plants indicates that the hourly and daily CO emissions limits during commissioning for the MEC Project are likely too restrictive. Data from Calpine’s Hermiston Power Partnership (HPP) Oregon facility was provided to show experience in both anticipated cold startup and commissioning emissions. A summary of this data is provided in Table 1.

**Table 1
HPP Single Turbine Cold Startup Emissions**

	NO _x	CO
Peak Instantaneous Rate, lbs/hr ¹	97	5,598
Peak Hour, lbs/hour	85	4,718
Cold Startup, lbs/event	142	7,663

Source: (CEC 2001). MEC 2005b.
Note: 1) Measured as a minute average lb/hr rate.

HPP does not have an oxidation catalyst, so a cold start will be similar to conditions during commissioning when the CO catalyst has not yet been installed at MEC.

Table 2 shows the requested revision to the turbine emission limits currently allowed during commissioning (CoC **AQ-11**). The previous emission rate limits in the Commission Decision are shown in parentheses for those quantities that have changed as a result of this amendment.

**Table 2
MEC Turbine Emission Limits During Commissioning**

	NO_x	CO
Commissioning, lb/hour (total, two turbines/HRSGs)	381.2	5,000 (930)
Commissioning, lb/day (total, two turbines/HRSGs)	4,805	20,000 (11,498)

Source: (CEC 2001). MEC 2004a, Table 3.

Only the commissioning CO emission limits are requested to be revised, and comparing Table 1 and Table 2, staff believes that the revised values appear to be reasonable based on the cold startup emission rates monitored at the HPP facility.

Air Quality Analysis

The proposed modifications affect maximum hourly emissions during the commissioning period, as well as maximum daily CO emissions during the commissioning period. Maximum daily and annual emissions are otherwise unchanged. Additionally, sulfur dioxide (SO₂) and particulate matter (PM₁₀) emissions are not elevated above normal operating limits during commissioning activities. Therefore, only the 1-hour average NO_x and CO impacts and the 8-hour average CO impacts have been reevaluated. Maximum ground-level impacts for allowable operation of the facility are shown together with the ambient air quality standards in Table 3. Implementation of the proposed new permit limits for commissioning will not cause any new violations of the ambient air quality standards.

**Table 3
Applicant Commissioning Modeling Results**

Pollutant	Averaging Period	Project Impact (mg/m³)	Background Concentration (mg/m³)^a	Total Impact (mg/m³)	Limiting Standard (mg/m³)	Type of Standard	Percent of Standard (%)
NO ₂ ^b	1-Hour	192.8	214	407	470	CAAQS	87
CO	1-Hour	11,106	11,125	22,231	23,000	CAAQS	97
	8-Hour	1,926	7,811	9,755	10,000	CAAQS	98

Source: MEC 2004a, 2005a.

Note(s):

- a. Background concentration values have been updated to reflect the highest monitored concentrations from the San Jose monitoring stations for 2000, 2001, and 2003. The San Jose 4th Street station was shut down in early 2002 and the Jackson Street station did not start up until late 2002, so data for 2002 are incomplete.
- b. NO_x converted to NO₂ using ISC_OLM and concurrent ozone data from San Jose.

The worst-case impacts, NO₂ and CO, are shown to occur in elevated terrain. The worst-case NO₂ impacts are shown to occur anywhere from approximately 100 to 700 feet above the base facility elevation, with the top fifty modeled impact locations ranging

from 1,300 feet to the northwest of the site (Tulare Hill) to over 10,000 feet to the southwest of the site. The maximum predicted impacts found at elevations less than 25 feet higher than the elevation of the project site were less than one-half of the impacts predicted at the higher elevations.

The worst-case CO impacts are shown to occur over 400 feet above the facility elevation base to the northwest just less than a mile from the facility for the maximum 1-hour impacts and just greater than a mile for the maximum 8-hour impacts. The maximum predicted 1-hour CO impacts found at elevations less than 50 feet higher than the elevation of the project site were less than one-quarter of the impacts predicted at the higher elevations.

The commissioning period will only occur for a limited time, which will limit the likelihood of the coincidence of worst-case meteorology, worst-case ambient background concentrations, and worst-case emissions. Additionally, there is a considerable margin for error considering the conservative assumptions used in the modeling analysis, which include: 1) the conservative modeling impact results obtained by the air quality dispersion modeling program ISCST3; 2) the addition of worst-case background to worst-case impacts even though these two events would occur under different ambient conditions; and 3) the use of what staff considers to be an overly conservative background CO concentration for this project site. Therefore, staff agrees with the project owner's conclusion that the revised worst-case startup emissions will not result in an exceedance of any ambient air quality standard.

Staff reviewed the project owner's modeling files and did not find any errors in the modeling inputs or errors in presenting the modeling results.

The data presented by the project owner shows that the requested revision to the commissioning CO hourly and daily emission limits are reasonable and warranted. Additionally, the air quality modeling analysis shows that the increased commissioning emission rates will not result in any new ambient air quality exceedances. Therefore, staff recommends that the requested revisions to **AQ-11** be approved.

Startup, Shutdown, and Combustor Tuning

MEC's Authority to Construct (ATC) allows the turbines to exceed their standard hourly emissions limitations during routine startups and shutdowns. The conditions in the ATC limit the maximum duration of each startup period to 180 minutes and limit the hourly and total pounds of NO_x, CO, and POC that may be emitted during each startup. The project owner is requesting to modify these conditions to: 1) recognize the difference between a cold start and warm/hot (i.e. routine) startups and provide for increased emission rates during a limited number of cold starts; 2) recognize that combustor tuning events will be occasionally necessary and that they would be similar to a cold start and are requested to have the same requested emission limits as a cold start; 3) to delete the hourly emission rate requirements for routine startups; and 4) increase the allowable shutdown event emissions. The CoCs affected are **AQ-21**, **AQ-22** and two new conditions (**AQ-56** and **AQ-57**) relating to a proposed limitation of the number of hours allowed in cold startup or combustor tuning mode.

Cold Startup and Combustor Tuning

The project owner is requesting the addition of a definition for a cold startup period and new emission limits for a cold startup. Based on Calpine's experience, a cold startup may take as long as 360 minutes to complete, longer than the current duration of 180 minutes allowed for a startup. The limited cold startup data provided for Calpine's Sutter facility reported elevated emission periods of almost five hours, and the single cold startup event provided for the HPP facility also showed an elevated emission period of over three hours. Additionally, as shown by the HPP facility cold startup data presented in Table 1, Calpine's experience indicates that the emissions during a cold startup will likely exceed the current startup emission limits.

The project owner has also identified that periodic combustor tuning events will be necessary, and that these events are recommended to occur over a roughly six hour period. The Siemens-Westinghouse emission tuning guidelines identify the following tuning steps (MEC 2003):

- Ignite and accelerate to full speed no load (FSNL)
- Load engine to 50% combustion turbine (CT) load and begin tuning at that load. Approximately 30 minutes
- Raise load to 60% CT load. Begin emissions/dynamics tuning. Approximately 1 hr.
- Raise load to 70% CT load. Begin emissions/dynamics tuning. Approximately 1 hr.
- Raise load to 80% CT load. Begin emissions/dynamics tuning. Approximately 1 hr.
- Raise load to 90% CT load. Begin emissions/dynamics tuning. Approximately 1 hr.
- Raise load to baseload. Begin emissions/dynamics tuning. Approximately 1 hr.
- Reduce the load down to 50% and then raise back to baseload to verify combustor settings are acceptable. Tuning complete.

Combustor tuning events could be necessary for many reasons, including equipment replacement, seasonal changes, and as an annual regular maintenance event. During combustor tuning events, the load conditions will be varied, and emissions are expected to be similar to startup emissions. Since the potential duration of a combustor tuning event is six hours, as recommended by the turbine manufacturer, the project owner is requesting that the event emissions for combustion tuning be twice that of a routine startup event, which is the same event emissions limit being requested for cold startups.

Table 4 shows the new NO_x, CO, and POC emission limits requested during steam turbine cold startup and gas turbine combustor tuning activities compared to the existing startup emission limits. The previous emission rate limits in the Commission Decision are shown in parentheses for those quantities that have changed as a result of this amendment.

The project owner is proposing to limit the combined cold startup and combustor tuning events to a maximum of 30 hours per year for each gas turbine.

**Table 4
MEC Turbine Emission Limits During Cold Startup and
Combustor Tuning Periods**

	NO_x	CO	POC
Cold Startup or Combustor Tuning, lb/period ^a	480 (240)	5,028 (2,514)	96 (48)

Sources: (CEC 2001, MEC 2004a).

Note(s):

- a. Definition of cold startup and combustor tuning event limits each to a six hour period per event. Only one gas turbine will be supporting a steam turbine cold startup or gas combustor tuning operation at a time.

Air Quality Impact Analysis for Cold Startup and Combustor Tuning

The proposed condition modifications affect maximum short-term emissions during cold startup and combustor tuning periods. Post-commissioning maximum daily and annual emissions are unchanged. Additionally, SO₂ and PM₁₀ emissions are not elevated above normal operating limits during startup and tuning activities. Therefore, only the 1-hour average NO_x and CO impacts and the 8-hour average CO impacts have been reevaluated.

For the 1-hour averaging period, emissions for the modeling analysis have been calculated assuming only one gas turbine will be in be startup mode at a time. Further, only one gas turbine will be supporting a steam turbine cold startup or gas combustor tuning operation at a time. For the 8-hour averaging period, emissions for the modeling analysis have been calculated assuming that one turbine initiates a 6-hour steam turbine cold startup or gas turbine combustor tuning period at the beginning of the 8-hour period and the second turbine initiates a routine startup during the last two hours of the 8-hour scenario.

Maximum ground-level impacts for allowable operation of the facility are shown together with the ambient air quality standards in Table 5. Implementation of the proposed new permit limits for startup and combustor tuning will not cause any new violations of the ambient air quality standards.

**Table 5
Applicant Startup/Combustor Tuning Modeling Results**

Pollutant	Averaging Period	Project Impact (mg/m³)	Background Concentration (mg/m³)^a	Total Impact (mg/m³)	Limiting Standard (mg/m³)	Type of Standard	Percent of Standard (%)
NO ₂ ^b	1-Hour	187.9	214	402	470	CAAQS	87
CO	1-Hour	10,882	11,125	22,007	23,000	CAAQS	96
	8-Hour	495	7,811	8,306	10,000	CAAQS	83

Source: MEC 2004a, 2005b.

Note(s):

- a. Background concentration values have been updated to reflect the highest monitored concentrations from the San Jose monitoring stations for 2000, 2001, and 2003. The San Jose 4th Street station was shut down in early 2002 and the Jackson Street station did not start up until late 2002, so data for 2002 are incomplete.
- b. NO_x converted to NO₂ using ISC_OLM and concurrent ozone data from San Jose.

Similar to the commissioning modeling results, the worst-case impacts from cold startup or combustor tuning events are predicted to occur at elevated terrain. The worst-case

impacts to locations below or near the elevation of the MEC facility will be considerably lower than the maximum impacts shown in Table 5.

BAAQMD's Prevention of Significant Deterioration (PSD) Rule 2-2-233 requires that pollutants modeled above the significant impact levels undergo additional analysis, or in the case of the 8-hour CO significant impact level, also require that pre-construction monitoring be performed. Table 6, and a comparison of the modeled impact values presented in Table 3, shows that the maximum 1-hour modeled impacts during startup/combustor tuning events and during initial commissioning will exceed significance levels, while the 8-hour CO significant impact level is not exceeded.

Exceeding the 1-hour significant impact levels require that the modeled impacts be added to background levels to ensure that the project will not cause new ambient air quality exceedances. Table 3 and Table 7 show that the impacts from the cold startups/combustor tuning events and initial commissioning will not cause a new exceedance. Therefore, compliance with the PSD rule has been demonstrated. It should be noted that the PSD significant impact levels are not CEQA significance levels, which as defined by CEC staff would be causing or significantly contributing to an exceedance of an ambient air quality standard. Since this is not the case, staff concludes that the revisions to these short-term emission rates will not cause any significant air quality impacts.

Table 6
MEC Comparison of Maximum Modeled Cold Steam Turbine
Startup/Combustor Tuning Impacts with Significance Thresholds

Pollutant	Averaging Period	Maximum Modeled Impact (mg/m ³)	Significant Air Quality Impact Level (mg/m ³)
NO ₂	1-Hour	187.9	19
CO	1-Hour	10,882	2,000
	8-Hour	495	500

Source: MEC 2004a, MEC 2005.

The project owner averaged the worst-case startup scenario for an eight-hour period, which was found to be an acceptable approach by BAAQMD for compliance with BAAQMD PSD regulations. There is a considerable margin for error considering the conservative assumptions used in the modeling analysis, which include: 1) the conservative modeling impact results obtained by the air quality dispersion modeling program ISCST3; 2) the addition of worst-case background to worst-case impacts even though these two events would occur under different ambient conditions; and 3) the use of what staff considers to be an overly conservative background concentration for this project site. Therefore, staff agrees with the project owner's conclusion that the revised worst-case startup emissions will not result in an exceedance of any ambient air quality standard.

Routine Turbine Startup and Shutdown Emissions

The project owner's experience at its other similar gas turbine plants indicates that the current routine startup and shutdown emission limits likely could not be met consistently. The project owner is proposing to eliminate the hourly startup emission limits and leave the emission limits per startup event unchanged; and is also proposing to increase the shutdown emission limit to the hourly emission limit value currently allowed for startups. The requested revisions to the startup limits are consistent with the existing limits for several other similar Calpine facilities under BAAQMD jurisdiction (LMEC, Delta, Russell City). Table 7 compares the requested revisions to the NO_x, CO, and POC routine startup and shutdown emission limits with the current emission limits. The previous emission rate limits in the Commission Decision are shown in parentheses for those quantities that have changed as a result of this amendment.

**Table 7
MEC Turbine Emission Limits During Startup and Shutdown**

	NO_x	CO	POC
Startup, lb/hour and lb/start ^a	NA / 240 (80/240)	NA / 2,514 (902/2,514)	NA / 48 (16/48)
Shutdown, lb/shutdown ^b	80 (18)	902 (43.8)	16 (5)

Sources: (CEC 2001, MEC 2004a)

Note(s):

NA = Not Applicable

a. Eliminate hourly limits.

b. Maximum of one hour for shutdown.

Table 8 provides a list of routine startup and shutdown emissions monitored at other Calpine facilities compared to the current emission limits.

**Table 8
Monitored Routine Startup and Shutdown Emission Rates**

Facility/Event	NO_x		CO	
	Monitored	Current Limit	Monitored	Current Limit
Sutter/Startup	104.1 lbs/hr	80 lbs/hr	--	--
HPP/Startup ^a	--	--	1,820 – 2,426 lbs/hr	902 lbs/hr
Sutter Shutdown ^b	19 – 26 lbs/hr ^b	18 lbs/hr	--	--

Source: (CEC 2001). MEC 2005b.

Note(s):

a. Total of three event in this emission range occurred during July and August 2004. Also note that the HPP facility does not have a CO catalyst and therefore should provide somewhat conservative routine startup CO emission values.

b. Total of nine events in this emission range occurred between 6/2004 and 12/2004.

As Table 8 shows, it is a reasonable expectation that the current routine startup and shutdown emission limits are not sufficient and it is prudent to revise those limits to values that should guarantee compliance with the CoCs.

The impacts associated with the proposed revisions to the routine startup and shutdown emission limits would be less than those presented for commissioning and cold startup/combustor tuning events, which were not found to cause significant impacts. Therefore, the requested revisions to the routine startup and shutdown emission limits would also not cause significant impacts. Post-commissioning maximum daily and annual emissions are unchanged. Additionally, SO₂ and PM₁₀ emissions are not elevated above normal operating limits during startup and tuning activities. Therefore, only the one-hour average NOx and CO impacts and the eight-hour average CO impacts have been reevaluated.

Conclusion

The requested revisions to the startup and shutdown conditions will not result in significant air quality impacts. Additionally, these revisions will not increase the daily or annual emission limits for the facility; which can be maintained by proper startup sequencing and through the expected lower than permitted normal operating emissions, and the daily and annual emission limits will be verified by the CEMs and the annual source tests. Staff agrees that the revisions to the startup/shutdown conditions are prudent and reasonable and recommends approval of the requested revisions to CoCs **AQ-21** and **AQ-22**, and the new CoCs **AQ-56** and **AQ-57**.

Miscellaneous Requested Revisions to the CoCs

Testing and Reporting Deadlines

Based on Calpine's experience, it has not proven possible for a source test team to complete the data analysis, sample analysis, quality assurance and report preparation necessary to produce a thorough and accurate source test report within 30 days of the source test date. Therefore, MEC, LLC is requesting that the deadline for *submitting* source test results to the District be extended from the current 30 days to 60 days after the source testing date (Condition of Certification **AQ-30**, **AQ-31**, and **AQ-33**).

Initial performance and certification testing (source testing) is currently required to be *performed* within 60 days of startup (**AQ-30**, **AQ-31**, and **AQ-47**), which is inconsistent with the requirement to perform the testing within 120 days of startup in **AQ-12**. Furthermore, it has been found that 60 days may not be adequate time to complete all the required commissioning activities. Therefore, MEC, LLC is requesting that the initial performance and certification testing be changed to 90 days so that all testing deadlines are consistent.

Staff agrees that the revisions to make these deadlines consistent are reasonable and recommends approval of the requested deadline revisions to CoCs **AQ-12**, **AQ-30**, **AQ-31**, **AQ-33** and **AQ-47**.

Ammonia Slip Calculation

MEC, LLC is requesting a modification to the current CoC **AQ-30** that describes the method of calculating the ammonia slip emissions. The current condition requires the continuous recording of the ammonia injection rate and the determination of a

correlation between the heat input rate and ammonia injection rate with the resulting ammonia slip concentrations determined through a source test. It is proposed to modify this condition to allow ammonia slip to be calculated using a District-approved ammonia slip calculation, where the correction factor in the calculation will be established using a District-approved source test, which is related to inlet/outlet NOx concentrations rather than heat input rate. This revision conforms to current District ammonia slip calculation methods and should provide for a more accurate method for determining the ammonia slip emissions. Staff agrees that this request is reasonable and recommends approval of the requested revision to CoC **AQ-30**.

Editorial or Conforming Revisions to the CoCs

The requested revisions to CoCs **AQ-1**, **AQ-13**, **AQ-16**, **AQ-20**, **AQ-24**, **AQ-25**, **AQ-27**, **AQ-28**, **AQ-34**, and **AQ-46** are editorial corrections or are necessary only to conform to the substantial revisions requested for other CoCs and are not in themselves substantial changes. Staff agrees that these requested revisions are reasonable and appropriate and recommends the approval of these requested revisions to the CoCs.

Conclusions and Recommendations

Staff's review of the requested amendment has determined that the requested revisions to the definitions and conditions are prudent and would not cause any significant air quality impacts or revise staff's original finding that the project impacts are properly mitigated. Staff has also reviewed and, as necessary, incorporated condition revisions proposed in an internal draft of the PDOC conditions prepared by BAAQMD. Staff recommends that the revised definitions and CoCs be approved as shown below, including the minor editorial changes that have been proposed by staff or by BAAQMD.

It is possible that after further review the District may revise the definitions and/or conditions prior to publishing the PDOC, or that the District and CEC may find that revisions are necessary to address comments received by the project owner or the public during public review period. If necessary, an amendment to this analysis will be prepared that provides any additional revisions to the definitions and CoCs.

Definitions

New definitions have been added to define cold startup and combustor tuning periods, with durations of six hours per period. Other editorial changes have been made as well. Below are the revised and new definitions, with additions shown in bold, underlined text and deletions shown in strikethrough text.

Gas Turbine Cold Startup 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 condition 20(b), following a shutdown of at least 72 hours.

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 startup 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, and 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 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.

Conditions of Certification

As a result of project operational changes and changes to the testing and reporting deadlines and ammonia slip calculation, and to address editorial and continuity issues, the project owner has requested the following conditions of certification to be revised: **AQ-1, AQ-10 to AQ-13, AQ-16, AQ-20 to AQ-22, AQ-24, AQ-25, AQ-27, AQ-28, AQ-30, AQ-31, AQ-33, AQ-34, AQ-40, AQ-41, AQ-46, and AQ-47.** Two new conditions, **AQ-56** and **AQ-57** (new BAAQMD conditions 48 and 49), were also proposed by the project owner to limit the number of hours operating in cold startup and combustor turning modes.

CONDITIONS FOR THE COMMISSIONING PERIOD

AQ-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. Conditions 1 through 12 shall only apply during the commissioning period as defined above. Unless otherwise indicated, Conditions 13 through 47, **56, and 57** shall apply after the commissioning period has ended. **(PSD for NOx and CO)**

Verification: The owner/operator shall submit a monthly compliance report to the California Energy Commission Compliance manager (CPM). In this report the owner/operator shall indicate how this Condition is being implemented.

AQ-10 The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM₁₀, 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 25, except that total, cumulative NOx mass emissions from S-1, S-2, S-3, and S-4 shall not exceed 485 **150** tons during any consecutive twelve-month period which includes a portion of the Commissioning Period. **(Offsets)**

Verification: In the monthly compliance report the owner/operator shall indicate the cumulative number of firings **hours** without SCR. The owner/operator shall submit a copy of the completion notice to the CPM.

AQ-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)

NOx (as NO ₂)	4,805 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)

Verification: In the monthly compliance report the owner/operator shall indicate any violations of the above emission limits.

AQ-12 Prior to the end of the Commissioning Period **and not later than 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 Condition 21. The source test shall determine NOx, 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 (3) start-up and three (3) shutdown periods. Twenty (20) 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 twenty (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 ~~thirty (30)~~ **sixty (60)** days of the source testing date. **(PSD for NOx and CO)**

Verification: Approval of the source test plan and receipt of the source test reports is the verification of compliance with this Condition.

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

AQ-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. (BACT for SO₂ and PM₁₀)

Verification: As part of the semiannual Air Quality Reports (~~as required by AQ-43~~), the project owner shall indicate the date, time, and duration of any violation of this Condition.

AQ-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 per year. (Offsets)

Verification: As part of the Air Quality monthly Reports, the owner/operator shall include information on the date and time when the daily **annual** fuel consumption exceeded this daily **annual** limit.

AQ-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 a Gas Turbine shutdown, a Gas Turbine cold startup, or a combustor tuning period. (BACT, PSD, and Toxic Risk Management Policy)

- (a) Nitrogen oxide mass emissions (calculated as NO₂) 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 NO₂) 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% O₂, 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% O₂, 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) 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% O₂. If this limit is reduced, the corresponding mass emission rate limit specified in Condition 20(c) shall also be modified to reflect this reduction. (BACT for CO)

- (e) Ammonia (NH₃) emission concentrations at P-1 and P-2 each shall not exceed 5 ppmv, on a dry basis, corrected to 15% O₂, 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 District-approved ammonia slip calculation method in effect February 2005.** ~~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 NH₃)
- (f) Precursor organic compound (POC) mass emissions (as CH₄) 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 (SO₂) 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 (PM₁₀) mass emissions at P-1 and P-2 each shall not exceed 9 pounds per hour or 0.00452 lb PM₁₀/MM BTU of natural gas fired when HRSG duct burners are not in operation. Particulate matter (PM₁₀) mass emissions at P-1 and P-2 each shall not exceed 12 pounds per hour or 0.00565 lb PM₁₀/MM BTU of natural gas fired when HRSG duct burners are in operation. (BACT)
- (i) Testing to confirm the PM₁₀ emissions levels shall occur at least three (3) times per year during each of the first two (2) years of operation. Each year, at least one (1) monitoring test shall occur during winter months.

Verification: As part of the semiannual Air Quality Reports, the owner/operator shall indicate the date, time, and duration of any violation of this Condition. The owner/operator shall also include quantitative information on the severity of the violation.

AQ-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 **or during a combustor tuning period** shall not exceed the limits established below. (PSD)

	Start-Up (lb/start-up)	Start-Up (lb/hr)	<u>Cold Startup or Combustor Tuning (lb/period)</u>	Shutdown (lb/shutdown)
Oxides of Nitrogen (as NO ₂)	240	80	<u>480</u>	<u>1880</u>
Carbon Monoxide (CO)	2,514	902	<u>5,028</u>	<u>43,890</u>
Precursor Organic Compounds (as CH ₄)	48	16	<u>96</u>	<u>516</u>

Verification: As part of the semiannual Air Quality Reports, the owner/operator shall indicate the date, time, and duration of any violation of this Condition. The owner/operator shall also include quantitative information on the severity of the violation.

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

Verification: In the monthly compliance report the owner/operator shall indicate any violations of this Condition.

AQ-24 Total combined emissions from the Gas Turbines and HRSGs (S-1, S-2, S-3, and S-4), including emissions generated from the cooling tower and 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 NO₂) per day (CEQA)
- (b) 7,891.1 pounds of CO per day (PSD)
- (c) 230.2 pounds of POC (as CH₄) per day (CEQA)
- (d) 571.4 pounds of PM₁₀ per day (PSD)
- (e) 57.9 pounds of SO₂ per day (BACT)

Verification: As part of the semiannual Air Quality Reports, the owner/operator shall indicate the date of any violation of this Condition including quantitative information on the severity of the violation.

AQ-25 Cumulative combined emissions from the Gas Turbines and HRSGs (S-1, S-2, S-3, and S-4), including emissions generated from cooling towers and 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 NO₂) per year (Offsets)
- (b) 588 tons of CO per year (Cumulative Increase, PSD)
- (c) 28 tons of POC (as CH₄) per year (Offsets)
- (d) 91.3 tons of PM₁₀ per year (Offsets)
- (e) 10.6 tons of SO₂ per year (Cumulative Increase)

Verification: As part of the annual Air Quality Reports, the owner/operator shall indicate the date of any violation of this Condition including quantitative information on the severity of the violation.

AQ-27 The owner/operator shall demonstrate compliance with conditions 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 (O₂) 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 NO₂), 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 conditions 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 NO₂), 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 NOx mass emissions (as NO₂) 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 NOx emission concentrations, NOx mass emissions (as NO₂), corrected CO emission concentrations, and CO mass emissions for each Gas Turbine and associated HRSG combined.
- (l) on a daily basis, the cumulative total NOx mass emissions (as NO₂) 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)

Verification: As part of the annual Air Quality Reports, the owner/operator shall indicate the date of any violation of this Condition including quantitative information on the severity of the violation.

AQ-28 To demonstrate compliance with conditions 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 (PM₁₀) mass emissions (including condensable particulate matter), and Sulfur Dioxide (SO₂) mass emissions from each power train. The owner/operator shall use the actual Heat Input Rates calculated pursuant to Condition 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, PM₁₀, and SO₂ 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, PM₁₀, and SO₂ mass emissions, for each year for all four sources (S-1, S-2, S-3, and S-4) combined.

(Offsets, PSD, Cumulative Increase)

Verification: As part of the monthly Air Quality Reports, the owner/operator shall indicate the date of any violation of this Condition including quantitative information on the severity of the violation.

AQ-30 Within ~~sixty (60)~~ **ninety (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 (NH₃) emission concentration~~ **establish the factors to be used** to determine compliance with Condition 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 NH₃ 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 100% full load, and steam injection power augmentation mode) to establish the ~~range of ammonia injection rates necessary to achieve NOx emission reductions while maintaining~~ correction factors that will be used to calculate ammonia slip levels. This source test shall be repeated on an annual basis thereafter. Continuing compliance with Condition 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)

Verification: At least ninety (90) days before start-up, the owner/operator shall provide a copy of the source test protocols. Approval of the source test protocols and the source test reports shall be deemed as verification for this Condition. The owner/operator shall notify the District and the CEC CPM within seven (7) working days before the execution of the source tests required in this Condition. Source test results shall be submitted to the District and to the CEC CPM within ~~thirty (30)~~ sixty (60) days of the date of the tests.

AQ-31 Within ~~sixty (60)~~ ninety (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 Conditions 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 Conditions 20(c) and (d), and to verify the accuracy of the continuous emission monitors required in Condition 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 NO₂), carbon monoxide concentration and mass emissions, sulfur dioxide concentration and mass emissions, methane, ethane, and particulate matter (PM₁₀) emissions including condensable particulate matter. (BACT, offsets)

Verification: At least ninety (90) days before start-up, the owner/operator shall provide a copy of the source test protocols. Approval of the source test protocols, as required in Condition 58, and the source test reports shall be deemed as verification for this Condition. The owner/operator shall notify the District and the CEC CPM within seven (7) working days before the execution of the source tests required in this Condition. Source test results shall be submitted to the District and to the CEC CPM within ~~thirty (30)~~ sixty (60) days of the date of the tests.

AQ-33 Within ~~sixty (60)~~ ninety (90) days of start-up of the MEC and on a 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 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 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)

Verification: The owner/operator shall notify the District and the CEC CPM at least seven (7) working days before the owner/operator plans to conduct source testing as required by this Condition. Source test results shall be submitted to the District and the CEC CPM within ~~thirty (30)~~ **sixty (60)** days of conducting the test.

AQ-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, equipment breakdown reports, etc.) 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. (Regulation 2-6-502)

Verification: At least ninety (90) days before start-up, the owner/operator shall provide a copy of the test protocols. Submittal of the reports to the CEC CPM constitutes verification of compliance with this Condition. All reports shall be submitted to the CEC CPM ~~within~~ when they are due according to District Rules and Regulations.

AQ-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)

Verification: No more than thirty (30) days after the issuance of an Authority to Construct, the Owner/Operator shall provide a copy of the ATC to the CEC CPM for review.

AQ-46 The owner/operator ~~cooling towers~~ shall be properly installed and the cooling towers and shall maintained 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 ppm ~~wv~~ (mg/l). The owner/operator shall sample the water at least once per day. (PSD)

Verification: At least thirty (30) days prior to installation, the owner/operator shall submit to the CEC CPM a performance guarantee letter from the cooling tower

manufacturer. As part of the compliance record, the owner/operator shall keep records on-site on the TSG **TDS** content of water in the cooling tower.

AQ-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 ~~sixty (60)~~ **ninety (90)** days of the initial operation of the cooling tower, the owner/operator shall perform an initial performance source test to determine the PM₁₀ emission rate from the cooling tower to verify compliance with the vendor-guaranteed drift rate specified in Condition 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 46. (PSD)

Verification: As part of the monthly Air Quality Reports, the owner/operator shall indicate the date of any violation of this Condition including quantitative information on the severity of the violation.

AQ-56 The total number of hours during which the Gas Turbines (S-1 and S-3) may be operated in cold startup mode or may undergo combustor tuning shall not exceed 30 hours per calendar year total for each Gas Turbine. (cumulative increase)

Verification: As part of the annual Air Quality Report, the project owner shall indicate the date, time, and duration of any violation of this Condition.

AQ-57 To demonstrate compliance with condition 56, the owner/operator shall record the start time, end time and duration of each Gas Turbine Cold Startup and each Combustor Tuning Period. On an annual basis, the owner/operator shall record the total number of hours during which each turbine (S-1 and S-3) the Gas Turbines operated in cold startup mode or combustor tuning mode for each calendar year. (cumulative increase)

Verification: During site inspection, the owner/operator shall make all records and reports available to the District, California Air Resources Board, and CPM.

References

California Energy Commission (CEC). 2001. Commission Decision on the Metcalf Energy Center Project (Docket No. 99-AFC-3). September 24, 2001.

Metcalf Energy Center, LLC (MEC). 2003. Letter from David Ziegler, Calpine, to Mr. Kelly Wee, BAAQMD. October 6, 2003.

Metcalf Energy Center, LLC (MEC). 2004a. Metcalf Energy Center, Amendment 1, November 17, 2004.

Metcalf Energy Center, LLC (MEC). 2005. Metcalf Energy Center, Response to Data Requests, January 18, 2005; and Additional Response to Data Requests, various dates January, 2005.

Metcalf Energy Center, LLC (MEC). 2005b. Metcalf Energy Center, Revisions to CO Startup Modeling. January 7, 2005.

_____. 1999. Application for Certification for Metcalf Energy Center. April 30, 1999.