

CALIFORNIA ENERGY COMMISSION1516 NINTH STREET
SACRAMENTO, CA 95814-5512

DATE: December 18, 2003

TO: Interested Parties

FROM: Ila Lewis, Compliance Project Manager

SUBJECT: **Otay Mesa Project (99-AFC-5C)
Public Review of Staff Analysis of Proposed Project Modifications
(Separate and Increase Stack Height of HRSG/Turbine, Add Duct
Firing and Small Auxiliary Boiler) - REVISED**

The Otay Mesa Generating Project is a 510 megawatt, combined cycle, natural gas-fired power plant that is under construction. The facility is located approximately 14 miles southeast of the City of San Diego in the Otay Mesa area of San Diego County.

On September 28, 2002, the California Energy Commission (Energy Commission) received a petition from the Otay Mesa Generating Company, LLC (now Calpine Corporation) to modify the Otay Mesa Generating Project (OMGP).

Calpine proposes to separate the turbine and heat recovery steam generator (HRSG) exhaust stacks and increase stack height from 144 feet to 160 feet, add duct firing capability to the HRSG to increase output during peak demand periods to 600 MW, clarify use of an oxidation catalyst for air emission reduction, add a small boiler in order to provide steam for auxiliary purposes, add a wet surface air condenser; and revise emission rates related to start up and shutdown operations. These modifications to the facility design will improve the performance and reliability of the facility.

Energy Commission staff reviewed the proposed petition and assessed the impacts of this proposal on environmental quality, public health and safety. All environmental and engineering technical areas potentially impacted by the proposed petition have been reviewed. The staff has recommended changes to conditions of certification in the areas of air quality, biological resources, and facility design. The petition seeks to modify air quality conditions of certification in order to mitigate impacts and clarify equipment changes. The petition also seeks to modify biological resources conditions to increase compensation to the Quino Checkerspot Butterfly Research Endowment, if required, due to potential increase in nitrogen deposition. In addition the petition also seeks to modify the facility design condition of certification GEN-2 to modify Table 1 (Major Structures and Equipment) to include the auxiliary boiler.

Staff proposes revisions to existing Air Quality Conditions of Certification AQ-5 through AQ-65 and the addition the San Diego County Air Pollution Control District (SDCAPCD) Conditions of Certification AQ-80 through AQ-88 and staffs recommendation for the addition of Conditions AQ-77 through AQ-79. Biological Resources staff have determined that two new Conditions of Certification need to be added, Bio-13 and Bio-

14, which address any future modeled nitrogen increases that will effect the Quino checkerspot research endowment. Facility Design staff recommends changes to Table 1 (Major Structures and Equipment) in GEN-2 to include the auxiliary boiler. It is the Energy Commission staff's opinion that, with the implementation of the revised and new conditions, the project will remain in compliance with applicable laws, ordinances, regulations, and standards and that the proposed modifications will not result in a significant adverse direct or cumulative impact to the environment (Title 20, California Code of Regulations, Section 1769).

The revisions to this petition dated December 3, 2003 are administrative as determined by the California Environmental Protection Agency, the San Diego Air Quality Control District (District), and California Energy Commission. The revisions consist of additions to the text describing the District's revised Determination of Compliance (DOC), minor revisions to AQ-39, -44, and -45, deletion of AQ-89 and -90, revisions to the numbering of Table 8 and associated text, and the addition of the new DOC reference.

The analyses for air quality, biological resources, and facility design are attached for your information and review. Energy Commission staff intends to recommend approval of the petition at the January 14, 2004 Business Meeting of the Energy Commission. If you have comments on this proposed project change, please submit them to me at the address above prior to December 31, 2003. If you have any questions, please call me at (916) 654-4678 or e-mail at ilewis@energy.state.ca.us.

Attachment

Mail List # 708 and POS

ENERGY COMMISSION STAFF ANALYSIS OF THE REQUEST TO AMEND THE OTAY MESA GENERATING PROJECT (OMGP) 99-AFC-5C Amendment Request 1B (Revised 12/16/03)

AMENDMENT REQUEST

The Otay Mesa Generating Company (OMGC) submitted the Amendment Request 1B for the Otay Mesa Generating Project (OMGP) on September 28, 2002 (OMGC 2002). Following the original notice dated October 3, 2003, OMGC requested minor changes to the San Diego Air Quality Control District's (District) Determination of Compliance (DOC). Reference to the changes to the revised Amendment Request 1B are provided below. The original amendment request is comprised of the following modifications to project equipment:

- separating the two previously collocated turbine/heat recovery steam generator (HRSG) exhaust stacks and increasing the stack heights from 144 to 160 feet;
- specifying the project turbines, which were not specified at the time of certification, as General Electric 7FA models, and specifying the associated power generator;
- adding duct firing capability (388 MMBtu/hr per HRSG) to the HRSG units and eliminating power augmentation (PAG) steam injection capability;
- adding an auxiliary boiler (87 MMBtu/hr);
- adding a wet surface air condenser; and
- modifying the equipment associated with the increase in steam production (i.e. steam condenser, steam turbine generator, air cooled condensers).

The revisions to this petition dated December 3, 2003, are administrative as determined by the California Environmental Protection Agency, the District, and California Energy Commission. The revisions consist of additions to the text describing the revised District's DOC, minor revisions to AQ-39, -44, and -45, deletion of AQ-89 and -90, revisions to the numbering of Table 8 and associated text, and the addition of the new DOC reference.

BACKGROUND

In August 1999, PG&E Generating filed an Application for Certification with the California Energy Commission to construct and operate a nominal 510 megawatt (MW) combined cycle project in Otay Mesa, California. The OMGP was certified in April 2001. The project sale to Calpine was approved October 2001. The original project design included two 7F type combustion turbine generators (CTG), a steam turbine generator, a dry cooling tower, and ancillary equipment. The project is under construction, albeit, at a measured pace. The fuel will be natural gas.

COMMISSION STAFF ANALYSIS

The analysis for facility design, biological resources and air quality are provided below.

FACILITY DESIGN ANALYSIS

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

If the proposed changes are approved, no changes to the applicable engineering LORS will result and the project will remain in compliance with all the applicable engineering LORS.

SUMMARY OF STAFF ANALYSIS

The analysis associated with the original application has not changed as a result of the above-proposed modifications except that the boiler and boiler stack will be added to the list of major structures and equipment, Table 1. This table has been provided in the California Energy Commission's approval letter to Ed Merrihew (Calpine Compliance Manager), dated December 27, 2001, to add a new Table 1 for Facility Design Condition of Certification Gen-2.

This amendment does not necessitate additional analysis or re-analysis of the project from an engineering perspective.

CONCLUSIONS, FINDINGS, AND MITIGATION MEASURES

The requested modifications in this amendment will not result in impacts on facility design. Facility Design staff recommends approval of this request and proposes the following change to the new **Table 1** of the existing Conditions of Certification.

CHANGE TO EXISTING CONDITIONS OF CERTIFICATION

Added text is **bold and double underlined**.

Facility Design Table 1: Major Structures and Equipment List

| Equipment/System | Quantity (Plant) |
|--|-------------------------|
| Combustion gas turbine (CT) Foundation & Connection | 2 |
| Steam turbine Foundation & Connection | 1 |
| Combustion Turbine Generator Foundation & Connection | 2 |
| Steam Turbine Generator Foundation & Connection | 1 |
| Heat Recovery Steam Generator (HRSG) Structure, Foundation & | 2 |

| Equipment/System | Quantity (Plant) |
|---|-----------------------------|
| Connection | |
| HRSG Stack Structure, Foundation & Connection | 2 |
| Generator Step-up Transformer | 2 |
| Auxiliary Transformer Foundation & Connection | 2 |
| Generator Breaker Foundation & Connection | 2 |
| CT Inlet Air Plenum Structure, Foundation & Connection | 2 |
| CT Inlet Air Evaporative Cooler Structure, Foundation & Connection | 2 |
| Cooling Tower/Air Cooled Condenser Structure, Foundation & Connection | 2 |
| CT & ST Building Structure, Foundation & Connection including generator auxiliary compartment (GAC), primary electrical center (PEC) & mechanical accessory compartment | 1 |
| Secondary Unit Substation/Transformer Foundation & Connection | 2 |
| Electrical Control Center (Switchgear) Structure, Foundation & Connection | 1 |
| CEMS Building Structure, Foundation & Connection | 1 |
| Boiler Feed Water Pump Foundation & Connection | 4 |
| Condenser Foundation & Connection | 2 |
| Condensate Pump Foundation & Connection | 4 |
| CT Static Starter Motor Foundation & Connection | 2 |
| Fuel Gas Compressor Building Structure, Foundation & Connection | 1 |
| ST Lube Oil Package Foundation & Connection | 1 |
| Ammonia Tank Structure, Foundation & Connection | 1 |
| Ammonia Blower Injection Skid Structure, Foundation & Connection | 1 |
| Pipe Rack Structure, Foundation & Connection | N/A |
| Stairways, Ladders & Platforms | N/A |
| Fire/Service Water Storage Tank Structure, Foundation & Connection | 2 |
| Demineralized Water Storage Tank Structure, Foundation & Connection | 2 |
| <u>Auxiliary Boiler Structure, Foundation & Connection</u> | <u>1</u> |
| <u>Auxiliary Boiler Stack Structure, Foundation & Connection</u> | <u>1</u> |
| Fire Water Pump Skid Foundation & Connection | 1 |
| Demineralized Water Treatment Building Structure, Foundation & Connection | 1 |
| Demineralized Water Pump Foundation & Connection | 2 |
| Administration Building Structure, Foundation & Connection | 1 |
| Warehouse/Mechanical Shop Structure, Foundation & Connection | 1 |
| Fire Pump Building Structure, Foundation & Connection | 1 |
| Switchyard Control Building Structure, Foundation & Connection | 1 |
| Switchyard, Busses & Towers | 1 Lot |
| Boiler Feed Pump Building Structure, Foundation & Connection | 1 Lot |
| High Pressure and Large Diameter Piping | 1 Lot |
| Potable Water Systems | 1 Lot |
| Drainage Systems (Including sanitary drain and waste) | 1 Lot |
| Building Energy Conservation Systems | 1 Lot |
| Temperature Control and Ventilation Systems (Including water and sewer connections) | 1 Lot |
| HVAC and Refrigeration Systems | 1 Lot |

| Equipment/System | Quantity (Plant) |
|---|-------------------------|
| Permanent Eye Stations | 1 Lot |
| Chemical Feed System Containment | 1 Lot |
| Water Treatment System Chemical Containment | 1 Lot |
| Ammonia System | 1 Lot |
| Electrical Systems | 1 Lot |

REFERENCE

OMGC (Otay Mesa Generating Company). 2002a. Amendment 1B to Application for Certification, Otay Mesa Generating Project (99-AFC-5). Submitted to the California Energy Commission, September 25, 2003.

BIOLOGICAL RESOURCES ANALYSIS

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The project owner will need to abide by all federal, state, or local laws, ordinances, regulations, or standards. For Biological Resources, the project will need to continue to abide by the federal Endangered Species Act and receive an amended Biological Opinion as part of the federal Section 7 consultation process.

SUMMARY OF STAFF ANALYSIS

Sensitive species impacts

All of the proposed project modifications will occur within the current project site, so there will not be any direct impacts to the Quino checkerspot butterfly (*Euphydryas editha quino*), a federally listed Endangered species, or its habitat. However, there may be indirect effects to its nearby critical habitat due to the project's proposed increase in nitrogen deposition that will result from proposed combustion equipment changes. The U. S. Fish and Wildlife Service identifies enhanced soil nitrogen along with habitat loss and fragmentation, invasion by non-native plants, off-road vehicle activity, grazing, fire, increased atmospheric carbon dioxide concentration, and climate change, as reasons for the species decline and current threats to this butterfly species.

New air modeling was done that accounts for the proposed project modifications covered for this amendment. However, the new predicted mean nitrogen deposition (calculated using the ISCST3 model in deposition mode) remains lower than the deposition predicted under the original modeling analysis (using the ISCST3 model in concentration mode). It is more appropriate to use the mean deposition of the ISCST3 model as an indicator of total N deposition, therefore, the original research and mitigation endowment of \$333,333 already established by the project owner with the San Diego Foundation for the benefit of the Quino checkerspot butterfly, that was based on the original modeling analysis, is considered adequate to cover the currently modeled nitrogen deposition.

To avoid the need for reinitiating the federal Endangered Species permit process each time there is a potential change in the nitrogen deposition, the project owner proposes that future mitigation fees be based on the nitrogen deposition modeling performed as part of this amendment (Amendment 1B). The mean nitrogen deposition rate of 0.0594 kilograms per hectare per year, averaged over the entire Quino checkerspot critical habitat area, the original fee of \$333,333 that was provided to mitigate for the indirect impacts of the modeled nitrogen deposition produces the following relationship - each future modeled deposition increase of 0.01 kilograms per hectare per year will require the project owner to add \$56,117 to the current research endowment. This calculation is independent of existing and future background nitrogen deposition rates and would be applied only to modeled increases from any future modification(s) to the Otay Mesa Generating project.

The U. S. Fish and Wildlife Service (USFWS) has determined that a depressed stock market during 2001 and 2002 produced a lower than expected annual payout for the Quino checkerspot research endowment and therefore the payout may not provide the intended mitigation funding. Once the project begins commercial operation, the project owner has agreed to pay the difference in deficit years so that the anticipated 4.5% annual payout is realized. Staff expects that any such "truing up" of the mitigation account will cease when the power plant facility is closed or when the research endowment is converted to a different use by the USFWS and the Energy Commission. Only the remaining balance that is in the account at the time of the calculation will be used to calculate the annual payout.

CONCLUSIONS, FINDINGS, AND MITIGATION MEASURES

Staff concludes that the proposed project changes will not cause any significant unmitigated biological resource impacts to state and federally listed species. However, staff also concludes that to be in compliance with the federal Endangered Species Act, the project owner will need to acquire an amended Biological Opinion from the U. S. Fish and Wildlife Service.

The project owner has provided an amended Biological Assessment for this amendment which is currently under review by the U. S. Fish and Wildlife Service. Once the Biological Assessment is deemed data adequate the U. S. Fish and Wildlife Service will provide an amended Biological Opinion to the project owner. Once the project owner receives this document, the project owner must make any necessary changes to the project's Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and provide the revised BRMIMP (per Biological Resources Condition of Certification **BIO-9**) to the Commission Compliance Project Manager (CPM) for review and approval. In addition, the project owner must also provide a copy of the amended federal Biological Opinion to the CPM, per Biological Resources Condition of Certification **BIO-6**, for review. The project owner's requested project amendment does not require that any existing Conditions of Certification be changed, however staff proposes that two new Conditions of Certification be added.

PROPOSED NEW BIOLOGICAL RESOURCES CONDITIONS OF CERTIFICATION

BIO-13 For future modeled nitrogen increases, the project owner will provide additional compensation funds to the Quino checkerspot research endowment, unless otherwise specified by the CPM.

The method to be used to calculate future mitigation fees, as proposed by the project owner and requested by the U.S. Fish and Wildlife Service, will use the following assumptions and methods.

Using the nitrogen deposition rate of 0.0594 kilograms per hectare per year, averaged over the entire critical habitat area, along with the mitigation fee of \$333,333, and normalizing the ratio of the two, produces the following mitigation calculation equation for each nitrogen deposition increase of 0.01 kilogram per hectare per year:

$$\frac{[0.0594 \text{ kilograms per hectare per year}/\$333,333]}{[0.01 \text{ kilograms per hectare per year}/X]} =$$

$$\text{Solving for } X = \$56,117$$

Thus, for each modeled increase of nitrogen deposition of 0.01 kilograms per hectare per year will require that \$56,117 be added to the research endowment by the project owner.

The ISCST3 model, or another model using similar assumptions and project parameters, will be used to calculate the deposition rate.

This calculation is independent of existing and future background nitrogen deposition rates and is only applied to modeled increases from future project related air emission modification(s).

Verification: No fewer than 30 days prior to commencement of project operation that will result in an increase in nitrogen emissions, the project owner will provide, to the CPM, written verification that the additional compensation funds have been provided to the San Diego Foundation or the current manager of the Quino checkerspot research endowment.

BIO-14 For each year that the Quino checkerspot research endowment account does not return the desired 4.5 percent payout, the project owner will 'true up' the endowment.

The project owner will begin to make required compensation payments, when appropriate, after the Otay Mesa Generating Project has started commercial operation. Only the remaining balance that is in the account at the time of the calculation will be used to calculate the annual payout. Payments will cease when the facility is closed or when the U. S. Fish and Wildlife Service and the Energy Commission convert the research endowment to a different use.

Verification: As part of the Annual Compliance Report, the project owner will provide a copy of the San Diego Foundation Fund Advisory Statement, or similar fund statement by the current fund manager, for the Quino checkerspot research endowment.

If the fund advisor statement indicates that less than the 4.5 percent payout has occurred for the calendar year, then within 30 days of filing the Annual Compliance Report, the project owner must provide written verification to the CPM that the required additional compensation has been provided to the San Diego Foundation, or the current fund manager, for the Quino checkerspot research endowment.

AIR QUALITY ANALYSIS

The amendment request includes the following changes to project emissions, and requested revisions to permit conditions:

- deleting conditions related to the potential use of SCONO_x emission controls, as the project is now defined as exclusively using selective catalytic reduction (SCR) oxides of nitrogen (NO_x) emission controls;
- modifying conditions that discuss the installation/use of an oxidation catalyst, based on the contention that the use of an oxidation catalyst will not be necessary to meet current carbon monoxide (CO) emission limits for the project;
- revising the definition of a startup and increasing the startup/shutdown emission limits;
- revising operating emission limits based on new estimates and the new duct firing operating scenario, which decrease certain pollutant limits during certain operating scenarios/timeframes and increases pollutant limits under other operation scenarios/timeframes, including a large increase in volatile organic compound (VOC) emissions; and
- minor modifications to most other existing permit conditions.

Amendment 1B provides for a significant change in the project description, would significantly increase the project's short-term NO_x and CO emission limits, would significantly increase the project's VOC and CO annual emission limits, and would significantly decrease the project's PM₁₀ and SO₂ emission limits. The amendment request also includes an impact analysis that concludes that the requested equipment modifications and emission limit revisions will not cause significant environmental impacts.

On May 22, 2003, the San Diego County Air Pollution Control District (District) issued a draft Determination of Compliance (DOC) for Amendment 1B (District 2003b). Staff, the project owner, and U.S. Environmental Protection Agency (USEPA) provided the District with comments on the draft DOC, and the District then completed a Preliminary Determination of Compliance (PDOC) for public notice and a response to comments on August 6, 2003 (District 2003c, 2003d), and subsequently addressed additional

comments from the Energy Commission staff, the project owner, California Air Resources Board and USEPA and provided a Final Determination of Compliance and a revised response to comments on September 25, 2003 (District 2003e, 2003f).

Subsequent to the publishing of the FDOC the project owner requested a few minor revisions to the District's conditions, which were integrated into a revised DOC that was published during December 2003 (District 2003g).

USEPA withdrew the District's PSD permitting authority in April 2003; however, USEPA has subsequently provided the District a limited PSD permitting authority to process the permit revisions for this project.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

LORS identified in the Energy Commission decision for the OMGP also apply to this amendment request. Additional District LORS, beyond those identified in the Energy Commission decision, that apply to the revised project equipment are discussed in the District's FDOC (District 2003e).

SUMMARY OF STAFF ANALYSIS

This analysis section is comprised of a summary of the petition as it affects air emissions. It also includes an emissions analysis of start up and shut down, normal operations emissions, and impacts analysis and mitigation assessments. The changes that affect OMGP air emissions and air dispersion modeling impacts include:

- An increase in stack height from 144 feet to 160 feet and separation of the adjacent/collocated turbine/HRSG stacks. The original modeling analysis modeled the adjacent/collocated stack as a single equivalent stack, while the revised modeling the two separated stacks;
- The addition of 388 MMBtu/hr duct firing capacity in each HRSG;
- The recalculation of NO_x, VOC, CO, and sulfur dioxide (SO₂) emissions;
- The addition of a wet surface air condenser (WSAC) structure and its 0.2 lbs/hour of PM₁₀ emissions;
- Reduction of the permitted PM₁₀ emission rates from each HRSG stack from a maximum of 19.1 lbs/hour to a new maximum of 9 lbs/hour when operating without duct firing and 11.5 lbs/hour when operating with duct firing;
- Requested changes in maximum startup emissions;
- Deletion of some diesel emergency equipment;
- Revising the project description to eliminate the potential use of SCONO_x pollution controls (SCR will be used); and
- The reconfiguration of the site, which modifies the building downwash modeling inputs, including the addition of some site structures, and revision in the size of other site structures. This includes: increasing the size and moving the air cooled condenser structures; adding the WSAC and auxiliary boiler; and changing the dimensions of the demineralized water tanks, fire water tank, services water tank, medium voltage building, the steam turbine with pedestal, and several other small buildings.

The emissions and modeling impacts analysis necessarily includes all of these changes; therefore, the analysis discusses each of these requested revisions in the context of the entire project's new emission and impacts analysis.

EMISSIONS ANALYSIS

STARTUP/SHUTDOWN

A substantial increase to the turbine/HRSG startup emissions has been proposed. **Air Quality Table 1** provides the original startup emission estimate and the Amendment 1B proposed startup emissions.

**Air Quality Table 1
Proposed Changes to the OMGP Startup Emission Limits**

| Pollutant | Permitted Turbine Startup/Shutdown Emissions (lbs/hour) | Proposed Turbine/HRSG Startup Emissions (lbs/hour) | Percent Increase (Decrease) lbs/hr basis | Original Permitted Startup Event Emissions (lbs/event) | Proposed Turbine/HRSG Startup Emissions (lbs/event) | Percent Increase (Decrease) |
|--------------------------------|---|--|--|--|---|-----------------------------|
| NO _x ^{a b} | 44/44 | 240 | 445% | 33/88 | 480 | 1,355%/445% |
| CO ^{a b} | 600/887 | 2,706 | 351%/205% | 450/1,774 | 5,412 | 1,103%/205% |
| VOC ^{a b} | 39/49 | 48 | 23%/(-2%) | 29.25/98 | 96 | 228%/(-2%) |

Source: District 2000 and 2003e

Notes:

a. Hot or warm start / cold start emissions, respectively, where applicable.

b. Revised proposal does not separate hot, warm or cold starts.

Additionally, the Project Owner has requested specific shutdown emission limits as follows:

NO_x – 80 lbs/shutdown
 CO – 902 lbs/shutdown
 VOC – 16 lbs/shutdown

The requested changes to the startup/shutdown emission levels delete the different categories of startup (hot/warm-start and cold start) and combine all starts under a single category, and provide a separate shutdown category. The requested changes increase the quantity of emission allowed under startup, with the exception of the new VOC startup limit that is slightly less than the old cold startup limit. These changes cause a significant increase to the maximum emission potentials and impact the short-term modeling results. The project owner has requested these higher levels based on their experience with the Sutter Power Plant, which has a similar configuration, including an air-cooled condenser. Staff does not have enough data to support all of these higher startup/shutdown limits; however, staff is aware of the increased startup time and emissions that seem to be associated with power plants that have air cooling versus those with once-through or evaporative cooling. Therefore, since the District has approved these new startup/shutdown limits and since the new limits were not found to result in a significant ambient air quality impact, as shown below in the Impacts Analysis section, staff will agree to revise the startup/shutdown limits as requested.

NORMAL OPERATING EMISSIONS

The project owner's requested changes in the normal operating maximum hourly and annual emissions are shown in **Air Quality Table 2** and **3**.

Air Quality Table 2
Proposed Changes to the OMGP Hourly Emission Limits

| Pollutant | Original Permitted Turbine Emissions (lbs/hour) | Proposed Turbine/HRSG Emissions (lbs/hour) | Proposed Auxiliary Boiler Emissions (lbs/hour) | Proposed WSAC Emissions | Original Facility Emissions (lbs/hour) ^d | Proposed Facility Emissions (lbs/hour) ^d | Percent Increase (Decrease) |
|------------------|---|--|--|-------------------------|---|---|-----------------------------|
| NO _x | 14.0/14.9 ^a | 13.14 ^b /15.95 ^c | 0.96 | --- | 29.8 | 32.86 | 10.3% |
| CO | 29.4/27.1 ^a | 24.00 ^b /29.13 ^c | 3.26 | --- | 58.8 | 61.52 | 4.6% |
| VOC | 3.1/3.3 ^a | 4.58 ^b /5.56 ^c | 0.37 | --- | 6.6 | 11.49 | 74.1% |
| SO _x | 3.5/4.5 ^a | 1.3 ^b /1.6 ^c | 0.06 | --- | 9.0 | 3.26 | (-63.8%) |
| PM ₁₀ | 18/19.1 ^a | 9.0 ^b /11.5 ^c | 1.65 | 0.2 | 38.2 | 24.85 | (- 34.9%) |

Source: District 2000 and 2003e

Notes:

- a. Emission limit per turbine without and with steam injection power augmentation, respectively.
- b. Non-duct firing emissions per turbine.
- c. Duct firing emissions per turbine/HRSG.
- d. Worst case hourly emissions during normal operations.

Air Quality Table 3
Proposed Changes to the OMGP Annual Emission Limits

| Pollutant | Original Permitted Turbine Emissions (tons/yr) | Proposed Turbine/HRSG Emissions (tons/yr) | Proposed Auxiliary Boiler Emissions (tons/yr) | Proposed WSAC Emissions | Proposed Facility Emissions (tons/yr) | Percent Increase (Decrease) |
|------------------|--|---|---|-------------------------|---------------------------------------|-----------------------------|
| NO _x | 100 | 100 | 4.2 | --- | 100 ^a | 0% |
| CO | 235.2 | 301.7 | 14.3 | --- | 316.0 | 34.4% |
| VOC | 27.2 | 45.9 | 1.6 | --- | 47.5 | 67.2% |
| SO _x | 39.4 | 12.6 | 0.3 | --- | 12.9 | (-67.3%) |
| PM ₁₀ | 159.6 | 91.3 | 7.2 | 1.0 | 99.5 | (- 37.7%) |

Source: District 2000 and 2003e

- ^a Annual emissions of NO_x are capped at 100 tons/year.

The requested short-term operating emission limits for NO_x, CO and VOC all increase, and the requested annual emissions of CO and VOC increase. The annual emissions of NO_x remain capped at 100 tons/year. The requested SO_x and PM₁₀ emission limits decrease. The SO_x emission decrease is based on a lower fuel sulfur assumption.

The stack and facility-wide emission rates, shown in Air Quality Tables 2 and 3, decrease for PM₁₀, even with the addition of the WSAC. Annually, PM₁₀ emissions decrease by 60.4 tpy, from 159.9 tpy to 99.5 tpy. During the OMGP siting case (CEC 2000), Staff identified the combustion turbine PM₁₀ emission factor as overly conservative. Recent PM₁₀ source tests on the same turbine model suggest that the new 9 lbs/hour and 11.5 lbs/hour PM₁₀ emission limits (without duct firing and with duct firing, respectively) are achievable with an adequate compliance margin.

The WSAC PM₁₀ emissions are from water droplets being entrained in the airflow through the WSAC. The droplets, generally referred to as "drift," contain dissolved

solids and salts that are released to the atmosphere as PM₁₀ when the droplet evaporates. The WSAC emission rate of 0.2 lbs/hour PM₁₀ is based on a total dissolved solids concentration of 3,489 ppm, a maximum circulating water flow rate of 1.2 million gallons per hour, and 0.0006% efficiency drift eliminators (OMGC 2002). However, the project owner asserts that the WSAC will be operated with a more efficient drift eliminator (OMGC 2002), suggesting that the above assumptions result in a conservative PM₁₀ emission factor for the WSAC.

The FDOC indicates that the project owner has removed the diesel-fired emergency equipment from the project description. The emergency equipment apparently will be electrically driven.

Overall, the requested changes to the emission limits provide a net reduction of annual primary PM₁₀ and secondary PM₁₀ precursor pollutant emissions. However, the requested change to the emission limit for VOC, which is based on a revised calculation approach rather than a revised emission concentration limit, provides for a net increase of annual secondary ozone precursor pollutants. More description of the ozone precursor emission impacts is provided in the Mitigation discussion.

IMPACTS ANALYSIS

The project owner and the District completed air quality modeling impact analyses for the revised project. Staff reviewed this analysis, requested that the startup CO modeling analysis be corrected, and performed limited modeling runs to confirm the results of the project owner's analysis. The results of these analyses are provided in **Air Quality Tables 4 through 7**. **Air Quality Table 4** provides the worst-case short-term impacts under worst-case normal (non-startup/shutdown) operations and worst-case annual impacts.

Air Quality Table 4
“Normal” Operational Impact ISC Modeling Results

| Pollutant | Averaging Period | Project Impact (µg/m ³) | Background (µg/m ³) | Total Impact (µg/m ³) | Limiting Standard (µg/m ³) | Type of Standard | Percent of Standard |
|------------------------------|------------------|-------------------------------------|---------------------------------|-----------------------------------|--|------------------|---------------------|
| NO ₂ ^a | 1-Hour | 95.5 | 205 | 300.5 | 470 | CAAQS | 64 |
| | Annual | 0.65 | 37.6 | 38.3 | 100 | NAAQS | 38 |
| PM ₁₀ | 24-Hour | 4.8 | 103 | 107.8 | 50 | CAAQS | 216 |
| | Annual | 0.98 | 32 | 33 | 20 | CAAQS | 165 |
| CO | 1-Hour | 182.7 | 8,245 | 8,428 | 23,000 | CAAQS | 37 |
| | 8-Hour | 76.2 ^b | 4,398 | 4,474 | 10,000 | CAAQS | 45 |
| SO ₂ | 1-Hour | 9.1 | 392.6 | 401.7 | 655 | CAAQS | 61 |
| | 3-Hour | 7.7 | 183.2 | 190.9 | 1300 | NAAQS | 15 |
| | 24-Hour | 1.5 | 62.8 | 64.3 | 105 | CAAQS | 61 |
| | Annual | 0.08 | 10.5 | 10.6 | 80 | NAAQS | 13 |

Source: OMGC 2002, District 2003a, CEC staff modeling analysis

Notes: a. No adjustment to the modeled 1-hour NO_x value was made. The annual modeled NO_x concentration value is multiplied by the Annual NO_x Ratio Method (ARM) of 0.75.

b. Does not include operation of the auxiliary boiler, which would slightly increase the results.

The startup operations worst-case modeling results are provided in **Air Quality Table 5**. The SO₂ and PM₁₀ emissions are not elevated during startup, so their startup impacts

are not considered to be higher than the maximum normal operating impacts shown in Table 4.

**Air Quality Table 5
Turbine Startup Short-Term Impact ISC Modeling Results**

| Pollutant | Averaging Period | Project Impact ($\mu\text{g}/\text{m}^3$) | Background ($\mu\text{g}/\text{m}^3$) | Total Impact ($\mu\text{g}/\text{m}^3$) | Limiting Standard ($\mu\text{g}/\text{m}^3$) | Type of Standard | Percent of Standard |
|------------------------------|------------------|---|---|---|--|------------------|---------------------|
| NO ₂ ^a | 1-Hour | 201 | 205 | 406 | 470 | CAAQS | 86 |
| CO | 1-Hour | 9,025 | 8,245 | 17,270 | 23,000 | CAAQS | 75 |
| | 8-Hour | 1,797 | 4,398 | 6,195 | 10,000 | CAAQS | 62 |

Source: District 2003a

Note:

a. Value from ISC_OLM.

The initial commissioning operations were remodeled by the District and the worst-case modeling results are provided in **Air Quality Table 6**. The SO₂ and PM₁₀ emissions are not elevated during initial commissioning, so their initial commissioning impacts are not considered to be higher than the maximum normal operating impacts shown in Table 4.

**Air Quality Table 6
Initial Commissioning Short-Term Impact ISC Modeling Results**

| Pollutant | Averaging Period | Project Impact ($\mu\text{g}/\text{m}^3$) | Background ($\mu\text{g}/\text{m}^3$) | Total Impact ($\mu\text{g}/\text{m}^3$) | Limiting Standard ($\mu\text{g}/\text{m}^3$) | Type of Standard | Percent of Standard |
|------------------------------|------------------|---|---|---|--|------------------|---------------------|
| NO ₂ ^a | 1-Hour | 405 ^a | 21 ^b | 426 | 470 | CAAQS | 91 |
| CO | 1-Hour | 8,035 | 8,245 | 16,280 | 23,000 | CAAQS | 71 |
| | 8-Hour | 3,882 | 4,398 | 8,280 | 10,000 | CAAQS | 83 |

Source: District 2003a

Notes:

a. Value from ISC_OLM.

b. Background values were adjusted by the District to show the background concentration during the hour with the highest impact (project impact plus background).

A comparison of the maximum project impacts from the original proposed project and Amendment 1B is shown in **Air Quality Table 7**.

**Air Quality Table 7
Project Amendment Impacts Comparison**

| Pollutant | Averaging Period | Original Project Impact ($\mu\text{g}/\text{m}^3$) | Amendment 1B Impact ($\mu\text{g}/\text{m}^3$) | Percent Increase (Decrease) |
|--|------------------|--|--|-----------------------------|
| Maximum "Normal" and Short-Term Turbine Startup Operating Impacts | | | | |
| NO ₂ ^a | 1-Hour | 130 | 201 | 55% |
| | Annual | 0.8 | 0.65 | (-19%) |
| PM ₁₀ | 24-Hour | 4.6 | 4.8 | 4% |
| | Annual | 0.8 | 0.98 | 23% |
| CO | 1-Hour | 2,342 | 9,025 | 285% |
| | 8-Hour | 643 | 1,797 | 179% |

Sources: District 2000 and District 2003a.

Notes:

a. The 1-hour NO_x values are from ISC_OLM. The annual NO_x value is multiplied by the ARM of 0.75.

Air Quality Table 7 shows that the maximum modeled impacts from the amended project, for NO₂, PM₁₀ and CO, are generally higher than the impacts determined for the original project. Most of the differences in the short-term (1-hour and 8-hour) impacts are due to the request to increase the maximum startup emissions limits. The increases in the PM₁₀ emission impacts are due to the new equipment proposed (WSAC and auxiliary boiler), which have lower stacks and higher near-field impact potential. The decrease in the annual NO₂ impact is due to the changes in the HRSG stack configuration and stack height.

The project's emissions do not cause new violations of ambient air quality standards, but even with the increased stack height and reduced PM₁₀ emission rates, they still contribute to existing violations of the State PM₁₀ standards (see discussion in CEC 2000). However, as noted below, the PM₁₀ emissions have been mitigated to a level of insignificance through the use of emission offsets.

The modeling performed by the project owner did not include the diesel emergency equipment that was modeled for the original licensing analysis. The District has indicated in their FDOC that these engines will now be electrically driven. However, in case the project owner decides to use diesel-fired emergency equipment, Air Quality condition **AQ-4** requires that any and all ancillary combustion equipment, including emergency engines, obtain any necessary District permits prior to on-site delivery. Additionally, **AQ-17** and **AQ-18** require NO_x emissions from all other combustion equipment and emergency generators to be included in the facility emissions and annual cap. Staff has added Condition of Certification **AQ-79** to require the project owner to provide future air permitting information to the Energy Commission for review.

MITIGATION MEASURES

Increasing stack height is often used to reduce local air emission impacts; however, separating one stack into two separate stacks for the two turbine/HRSGs will have the opposite effect, due to lower exhaust buoyancy. Therefore, the overall effect of separating the stacks and increasing their height tend to counter each other and result in very little change in impact potential. The proposed stack height of 160 feet is still less than the Good Engineering Practice (GEP) stack height, determined to be 189 feet for this facility (District 2003e).

The proposed new equipment has been determined by the District to meet Best Available Control Technology (BACT) requirements. The addition of the duct burners caused an increase in the maximum NO_x emissions of greater than 10 lbs/day; therefore, by District rule a new BACT analysis for the turbine/HRSGs was required. In re-evaluating the BACT requirements the District has revised the averaging period for the 2.0 ppm NO_x emission limit from a 3-hour rolling average to a 1-hour rolling average with 15 hours per 12-month rolling period having conditionally allowed excursions. The conditions under which these limited excursions are allowed are specifically identified in the revised Condition of Certification AQ-36. Staff agrees with this assessment and believes that the proposed project's controls are adequate and that no additional emission control mitigation is necessary.

The project changes result in decreased project annual PM₁₀ and total PM₁₀ precursor (NO_x, SO_x, VOC and ammonia) emission limits and do not cause a significant increase

in the modeled PM₁₀ impacts. Therefore, no additional PM₁₀ or PM₁₀ precursor emission mitigation (specified in Conditions of Certification AQ-55, AQ-75 and AQ-76) is warranted; and no reductions in the existing project mitigation package have been requested by the project owner. Therefore, staff finds that the existing PM₁₀ and PM₁₀ precursor mitigation is sufficient.

Ozone is not directly emitted from the OMGP facility. Rather, ozone is formed in complex reaction with NO_x, VOC and sunlight. The project will contribute to an existing violation of the state and federal 1-hour ozone standard. Therefore, emissions of the ozone precursors (NO_x and VOC) need to be mitigated. The revised annual emission limit total requested for NO_x and VOC is 147.5 tons per year. The current mitigation package, specified in Conditions of Certification AQ-55, calls for a total of 166.45 tons per year of NO_x and VOC emission reduction credits (ERCs), including the NO_x ERCs from the Alternative Mobile Source Emission Reduction Credit (MERC) program. Additionally, Condition of Certification AQ-75 requires the project owner to pay a mitigation fee of \$1.2 million to the District to allocate to emission reduction programs, such as the Lower-Emissions School Bus Retrofit Program and the Carl Moyer Program, in order to reduce PM₁₀ and PM₁₀ precursor (i.e. NO_x) emissions in the District. Finally, Condition of Certification AQ-76 requires that all VOC emission reductions that occur intentionally or incidentally during the formation of the project's NO_x MERC credits be assigned to the project. Staff believes that the existing mitigation package, considered in its entirety, will offset the project's NO_x and VOC emissions at a ratio of at least 1:1, and therefore is sufficient.

No impacts from the project's revised CO emissions have been identified; therefore, no additional CO emissions mitigation is warranted.

CONCLUSIONS AND FINDINGS

The Otay Mesa Generating Company is proposing a project Amendment 1B, which will add duct burners to the turbine/HRSGs, add an auxiliary boiler, and separate the stacks for the two turbine/HRSGs and further increase the stack heights. Additionally, as part of this amendment, staff has completed an assessment of the air quality impacts of the WSAC. The short-term startup/shutdown emission limits are requested to be substantially increased. Additionally, the assumed PM₁₀ and SO₂ emission rates for the turbine/HRSGs are being reduced and the diesel emergency equipment are being replaced with electric equipment. The proposed changes reduce turbine and facility PM₁₀ and SO₂ emission limits, increase project VOC and CO emission limits and increase short-term NO_x emission limits (maximum annual NO_x emission limits do not change).

The District does not regulate the WSAC, so staff has added recommended conditions AQ-77 and AQ-78 for the WSAC. Additionally, staff has added recommended condition AQ-79 that requires the project owner to provide the CPM with all District and USEPA permitting information for review.

The modeling analysis does not show any significant impacts from the revised project equipment modifications and requested revisions to the project's emission limits. Additionally, as previously noted the project's existing mitigation package is sufficient to

mitigate the project's revised emission limits. Therefore, staff recommends approval of OMGP Amendment 1B with changes to conditions of certification as described below.

Proposed revised Conditions of Certification are attached below.

CONDITIONS OF CERTIFICATION TABLE

Air Quality Table 8 provides the rationale for the revisions and additions to the Conditions of Certification. The revision to or addition of Conditions AQ-5 through AQ-65 and AQ-80 through AQ-88 are based on revised or added District conditions, or conforming changes necessary in the verifications of these conditions due to the changes in the project design. The addition of Conditions AQ-77 through AQ-79 are new staff recommended conditions for the WSAC (AQ-77 and AQ-78), which is not regulated by the District, and to ensure that all subsequent District or USEPA air permitting information is provided to the CEC for review (AQ-79).

Air Quality Table 8
Revisions to Conditions of Certification

| CEC Condition | District Condition | Purpose for Change |
|---------------|--------------------|---|
| AQ-5 | 5 | District change in condition timing and deletion of reference to SCONOx. |
| AQ-6 | 6 | Stack height and configuration change, and conforming change to verification deleting reference to SCONOx.. |
| AQ-7 | 7 | Conforming change to verification deleting reference to SCONOx. |
| AQ-9 | --- | Deletion of SCONOx based condition. |
| AQ-10 | 9 | Deleted reference to portable CEMS that may have been used prior to final approval of the permanent CEMS. Now the permanent CEMS will be required at the time of initial firing. |
| AQ-16 | 15 | Revision of source test report due date requirement. |
| AQ-17 | 16 | Addition of annual CO emission limit and reporting requirements, addition of the auxiliary boiler into condition, and deletion of emergency engines. |
| AQ-18 | 18 | Addition of VOC and CO into record keeping requirements of condition, and addition of auxiliary boiler into condition, and deletion of emergency engines. |
| AQ-21 | 22 | District's revision of maximum hourly combined turbine NO _x emissions limit. |
| AQ-22 | 23 | Amended to note "rolling continuous 1-hour" averaging period. |
| AQ-23 | 24 | Amended to increase CO hourly limit and to note "rolling continuous 1-hour" averaging period. Deletion of load and concentration requirements. |
| AQ-24 | 25 | Conforming condition numbering changes only. |
| AQ-25 | 26 | Editorial correction and addition of last sentence of condition. |
| AQ-26 | 27 | Deletion of optimization period (i.e. SCONOx) requirement, and replacement of power augmentation with duct firing. |
| AQ-27 | --- | Deletion of SCONOx based condition. |
| AQ-28 | --- | Deletion of SCONOx based condition. |
| AQ-29 | --- | Deletion of SCONOx based condition. |
| AQ-30 | --- | Deletion of SCONOx based condition. |
| AQ-31 | --- | Deletion of SCONOx based condition. |
| AQ-32 | --- | Deletion of SCONOx based condition. |
| AQ-33 | --- | Deletion of SCONOx based condition. |
| AQ-34 | --- | Deletion of SCONOx based condition. |
| AQ-35 | 28 | Deletion of optimization/replacement period (i.e. SCONOx) requirement. Conforming language changes. |
| AQ-36 | 31 | Revises NOx limit from 3-hour to 1-hour rolling average under non-duct firing operation and allows 15 hours of excursions per 12-month period with specified language defining what constitutes an allowable excursion. |

| | | |
|-------|-----|--|
| AQ-37 | 32 | Amended to add more description regarding requirement timing, added shutdown and non-operations exception, and conforming condition number changes. |
| AQ-38 | 33 | Revision of language governing the VOC limit compliance requirements. |
| AQ-39 | 34 | Revisions in the hourly NO _x , CO and VOC emission limits under non-duct firing conditions, and replacement of power augmentation with duct firing. |
| AQ-40 | 35 | Revisions in the hourly NO _x , CO and VOC emission limits under duct firing conditions, and replacement of power augmentation with duct firing. |
| AQ-41 | 36 | Revised to include duct firing limitation and compliance requirements and delete power augmentation limitation and compliance requirements. |
| AQ-42 | 37 | Revises condition from hot/warm startup hourly emission limit for NO _x , CO and VOC to all inclusive startup hourly emission limits for NO _x , CO and VOC. |
| AQ-43 | 38 | Revises condition from cold startup hourly emission limits for NO _x , CO and VOC to all inclusive startup event emission limits for NO _x , CO and VOC, and adds a separate new shutdown event emissions limit. |
| AQ-44 | 39 | Revises condition from providing a hot/warm startup definition to providing a revised all inclusive startup definition as requested by project owner. |
| AQ-45 | 40 | Revises condition from providing a cold startup definition to providing a shutdown definition as requested by project owner. |
| AQ-46 | 41 | Deletion of term cold in referring to startups. Auxiliary boiler startup included in non-simultaneous startup limitation. |
| AQ-47 | 42 | Revises language to include the auxiliary boiler and shutdowns in the record keeping requirements. |
| AQ-48 | 43 | Revision of hourly turbine PM ₁₀ emission limits from 19.1 lbs/hr to 9.0 lbs/hour when operating without duct firing and 11.5 lbs/hour when operating with duct firing, and other minor editorial revisions. |
| AQ-49 | 49 | Deletion of SCONOX system language, revisions to allow "equivalent" source test methods, addition of auxiliary boiler load requirement during source test, allowance of conditional lower turbine load requirements during source testing, replacement of power augmentation with duct firing and other editorial revisions. |
| AQ-50 | 50 | Deletion of SCONOX system language and revised HAP emission limits. |
| AQ-53 | 53 | Revisions to allow "equivalent" source test methods, addition of auxiliary boiler load requirement during source test, allowance of conditional lower turbine load requirements during source testing, replacement of power augmentation with duct firing and other editorial revisions. |
| AQ-59 | 59 | Conforming change in verification to delete "optimization, replacement" and add "startup/shutdown". |
| AQ-60 | 60 | Conforming change in verification to delete "optimization, replacement" and add "startup/shutdown". |
| AQ-61 | 61 | Conforming change in verification to delete "optimization, replacement" and add "startup/shutdown". |
| AQ-62 | 62 | Conforming change in verification to delete "optimization, replacement" and add "startup/shutdown". |
| AQ-65 | 65 | Editorial correction. |
| AQ-77 | --- | New CEC condition that provides a PM ₁₀ emissions limit for the WSAC. |
| AQ-78 | --- | New CEC condition that provides for WSAC circulating water testing for compliance demonstration. |
| AQ-79 | --- | New CEC condition requiring the project owner to provide air permit modification documentation to the CPM for review. |
| AQ-80 | 17 | New District condition adding annual VOC emission limit and reporting requirements. |
| AQ-81 | 19 | New District condition adding maximum auxiliary boiler NO _x and CO emission concentration limits, and deletion of emergency engines. |
| AQ-82 | 29 | New District condition with continuous monitoring requirements to record ammonia stack concentration, and ammonia injection rate. |
| AQ-83 | 30 | New District condition providing ammonia slip concentration limit. |
| AQ-84 | 44 | New District condition limiting auxiliary boiler fuel use and record keeping requirement. |

| | | |
|-------|----|--|
| AQ-85 | 45 | Requires establishment of startup/shutdown parameters for the selected boiler. |
| AQ-86 | 46 | New District condition providing auxiliary boiler NO _x emission limit, and source test requirement. |
| AQ-87 | 47 | New District condition providing auxiliary boiler CO emission limit, and source test requirement. |
| AQ-88 | 48 | New District condition providing auxiliary boiler VOC emission limit, and source test requirement. |

The conditions are revised from those provided in the original Commission Decision (CEC 2001); and include the minor revisions requested by the project owner to District Conditions 34, 39 and 40 (AQ-39, -44 and -45), as well as, the deletion of two conditions concerning the auxiliary boiler that were based on an erroneous assumption by the District (September FDOC conditions 49 and 50) and that are unnecessary due to the requirements of District condition 45 (District 2003g).

PROPOSED CONDITIONS OF CERTIFICATION

DETERMINATION OF COMPLIANCE CONDITIONS

CONSTRUCTION (AT OR PRIOR TO INITIAL FIRING) CONDITIONS

AQ-5 The project owner shall submit to the District the final selection and design details of the gas turbines and associated equipment to be installed, including all proposed post-combustion control systems and the auxiliary boiler (~~SCONO_x or SCR~~). Such information may be submitted to the District under as Trade Secret and confidential ~~provisions~~ pursuant to District Rules 175 and 176.

Verification: At least 90 days prior to on-site delivery of equipment, the project owner shall provide copies of design details of the gas turbines and associated equipment to be installed, including all proposed post-combustion control systems (~~SCONO_x or SCR~~) and the auxiliary boiler to the CPM and the District.

AQ-6 The exhaust stacks for each turbine power station shall be at least ~~131-160~~ feet (~~48.839-9~~ meters) in height ~~and shall be positioned no more than one stack diameter away from each other.~~

Verification: The project owner shall provide copies of the design details of the gas turbines and associated equipment to be installed, including all proposed post-combustion control systems (~~SCONO_x and SCR~~) to the CPM and the District at least 90 days prior to on-site delivery of equipment.

AQ-7 The exhaust stacks for each turbine power station shall be equipped with source test ports and platforms to allow for the measurement and collection of stack gas samples consistent with all approved test protocols. The ports and platforms shall be constructed in accordance with District Method 3A, Appendix Figure 2.

Verification: The project owner shall provide copies of the design details of the gas turbines and associated equipment to be installed, including all proposed post-

combustion control systems (~~SCONOx and~~ SCR) to the CPM and the District at least 90 days prior to on-site delivery of equipment.

AQ-9 ~~Deleted. In the event the applicant elects to install the SCONOx system, the applicant shall undertake all reasonable efforts to achieve continuous NOx emissions below current BACT/LAER standards. The applicant shall submit to the District a protocol for achieving optimum operation of the SCONOx system and a NOx emission concentration of 1.0 ppmvd (at 15% oxygen, 3-hour average) for each turbine. This protocol shall include, at a minimum, the following:~~

- ~~a. The initial values for the regeneration cycle times.~~
- ~~b. The amount of natural gas or other source of hydrogen for the regeneration cycle (expressed as a concentration or percentage of total regeneration gas).~~
- ~~c. The testing scheme to vary the cycle times and the monitoring that will be done to determine the effectiveness of the changes on emission rates of NOx and CO.~~
- ~~d. The testing scheme to vary the concentrations of natural gas or other source of hydrogen for the regeneration.~~
- ~~e. Additional contingency measures to be taken to address possible failure modes.~~

~~Verification: The project owner shall provide copies of the protocol for achieving optimum operation of the SCONOx system to the District and to the CPM at least 30 days prior to initial firing.~~

AQ-10 Prior to initial firing of each turbine, a Continuous Emission Monitoring System (CEMS) shall be installed and calibrated to measure the concentrations of oxides of nitrogen (NOx), carbon monoxide (CO), and oxygen (O₂) in the exhaust gas on a dry basis, corrected to 15% oxygen. Upon initial firing ~~and prior to final approval of~~ the permanent CEMS system, ~~a portable CEMS,~~ which has been properly certified and calibrated, shall be operational. At least 60 days prior to the operation of ~~both the portable and~~ permanent CEMS, the project owner shall submit an operating protocol to the District for written approval. The ~~portable~~ CEMS shall remain in full operation at all times when the turbine is in operation, ~~until~~ the permanent CEMS, which has been shall be properly installed, and certified, ~~and is~~ in full operation at all times when the turbine is in prior to on-going operations.

Verification: The project owner shall provide copies of the operating protocol for the CEMS system to the District, for written approval, and to the CPM at least 60 days prior to operation of the CEMS system.

AQ-16 No later than 90 days after each unit commences commercial operation, a Relative Accuracy Test Audit (RATA) shall be performed on the permanent CEMS in accordance with 40 CFR Part 75 Appendix A Specifications and

Test Procedures. At least 45 days prior to the test date, the project owner shall submit a test protocol to the District for approval. Additionally, the District shall be notified a minimum of 45 days prior to the test so that observers may be present. Within ~~45~~30 days of completion of the test, a written test report shall be submitted to the District for approval.

Verification: The project owner shall provide copies of the CEMS RATA test to the District and the CPM no later than 90 days after each unit commences commercial operation. The project owner shall provide notice of the CEMS RATA test date and provide a CEMS RATA test protocol to the District and the CPM at least 45 days prior to the tests. The project owner shall provide a written CEMS RATA test report to the District, for approval, and the CPM within ~~45~~30 days of the test.

AQ-17 The total aggregate annual emissions from all emission units at the stationary source shall not exceed 100 tons of oxides of nitrogen (NOx) and shall not exceed 316 tons of carbon monoxide (CO), ~~calculated as nitrogen dioxide, from all emission units at the stationary source shall not exceed 100 tons, per for~~ each consecutive 12-calendar month period. -The NOx and CO emissions shall begin accruing at the initial firing of each turbine. Compliance with this limit shall be verified using the CEMS system on each gas turbine (Application Nos. 973880 and 973881) as well as EPA- or ARB-certified NOx emissions factors, testing results, or other representative emissions information for all other combustion equipment, including ~~emergency engines~~the auxiliary boiler.

Verification: The project owner shall maintain records, at least on a calendar monthly basis, of total aggregate mass emissions of NOx and CO, in tons per year, from all equipment, excluding exempt equipment, at this stationary source for the previous 12-month period. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-18 The project owner shall maintain records, at least on a calendar monthly basis, of total aggregate mass emissions of NOx, CO, and VOC, in tons per year, from all equipment, including ~~emergency equipment~~the auxiliary boiler, at this stationary source for the previous 12-month period. These records shall be maintained on site for a minimum of five years and made available to District personnel upon request.

Verification: The project owner shall maintain records, at least on a calendar monthly basis, of total aggregate mass emissions of NOx, CO, and VOC, in tons per year, from all equipment, excluding exempt equipment, at this stationary source for the previous 12-month period. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-21 ~~When operating without any post-combustion air pollution control equipment, t~~The total emissions from both turbines combined shall not exceed ~~1649-1133~~ pounds per hour of oxides of nitrogen (NOx), calculated as nitrogen dioxide and averaged over a rolling continuous 1-hour period. ~~Additionally, when operating without any post-combustion air pollution control equipment, the total emissions when only one turbine is in operation shall not exceed 1133 pounds per hour of NOx.~~ These emissions limits shall apply during startups and shutdowns.

Verification: The project owner shall maintain records of the NOx mass emissions of each gas turbine when operating without any post-combustion air pollution control equipment. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-22 When operating with post-combustion air pollution control equipment, the total emissions from both turbines combined shall not exceed 412 pounds per hour of oxides of nitrogen (NOx), calculated as nitrogen dioxide and averaged over a rolling continuous 1-hour period. Additionally, when operating with post-combustion air pollution control equipment, the total emissions when only one turbine is in operation shall not exceed 283 pounds per hour of NOx, calculated as nitrogen dioxide and averaged over a rolling continuous 1-hour period. These emissions limits shall apply during startups and shutdowns.

Verification: The project owner shall maintain records of the NOx emission concentrations of each gas turbine when operating with post-combustion air pollution control equipment. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-23 ~~When operating at less than 40% load, t~~The total emissions from both turbines combined emissions of carbon monoxide (CO) shall not exceed ~~2738500 pounds per hour ppm~~ of carbon monoxide (CO), averaged over a rolling continuous 1-hour period. ~~nor exceed 1000 ppm averaged over an 8-hour period. When operating at 40% load or greater, the emissions of carbon monoxide shall not exceed 1000 ppm averaged over a 1-hour period nor exceed 500 ppm averaged over an 8-hour period. All concentration limits shall be corrected to 15% oxygen.~~ These limits shall apply during startups and shutdowns.

Verification: The project owner shall maintain records of the CO emission concentrations of each gas turbine when operating, including startup and shutdowns. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air

Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

COMMISSIONING PERIOD CONDITIONS

AQ-24 Beginning at initial firing of each turbine, a "Commissioning Period" for each turbine shall commence. This Commissioning Period shall end 120 days after initial firing or immediately after written acceptance of clear custody and control of the equipment is turned over to the project owner, whichever comes first. During this Commissioning Period, only the requirements ~~emission limits~~ specified in Condition Nos. AQ-10, -13, -17, -18, -19, -20, -21, -22, -23, -80 and ~~-8125~~ shall apply.

Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine when operating during the commissioning period. These records shall be included in the Commissioning Period Progress Report required in AQ-24, and maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-25 Within 30 days after initial firing of each turbine, the project owner shall install post-combustion air pollution control equipment to minimize emissions from this equipment. The ~~applicant~~ project owner may request an extension, not to exceed an additional 30 days, in writing for District approval. This request shall include all technical reasons as to why the extension is needed. Such an extension will only be granted if the ~~applicant~~ project owner can demonstrate that such extension:

- a. is not the result of neglect or disregard of any air pollution control requirement;
- b. is not intentional or the result of negligence, as defined in District Rule 98;
- c. is not the result of improper maintenance;
- d. will not cause a nuisance;
- e. is not likely to create an immediate threat or hazard to public health or safety;
- f. will not interfere with the attainment or maintenance of any National or California Ambient Air Quality Standard; and
- g. good cause is shown for the extension.

Once installed, the post-combustion air pollution control equipment shall be maintained in good condition and shall be in full operation at all times when the turbine is in operation. Note that any day in which fuel is burned in this equipment shall be considered an operating day.

Verification: The project owner shall install post-combustion air pollution control equipment to minimize emissions from this equipment within 30 days after the initial firing of the gas turbines, unless the project owner requests an extension, not to exceed an additional 30 days, in writing for District approval.

AQ-26 Within 10 days after the end of the Commissioning Period for each turbine, the project owner shall submit a written progress report to the District. This

report shall include, at a minimum, the date that the Commissioning Period ended, the periods of startup, the emissions of NOx and CO during startup, and the emissions of NOx and CO during steady state operation with and without duct firing power augmentation. Emissions shall be in both ppmv and lbs/hr. This report shall also detail any turbine or emission control equipment malfunction, upsets, repairs, maintenance, modifications, or replacements affecting emissions of air contaminants that occurred during the Commissioning Period. ~~The report shall also describe all planned actions and tests to be conducted during the Optimization Period.~~

Verification: The project owner shall submit a Commissioning Period Progress Report for each gas turbine to the District and the CPM within 10 days after the end of each gas turbine commissioning period.

OPTIMIZATION PERIOD CONDITIONS

AQ-27 ~~Deleted.~~In the event that the project owner elects to install the SCONox system, immediately upon the end of the Commissioning Period, the "Optimization Period" for each turbine shall commence. For the purposes of the District's Determination of Compliance and Authority to Construct, the Optimization Period shall be defined as a 6-calendar month period in which the facility shall undertake all reasonable efforts to achieve a NOx emission level of 1.0 ppmvd at 15% oxygen averaged over a three hour period. In the event that the project owner elects to install an SCR system, the facility shall comply with the conditions for on-going operations.

~~Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine when operating during the optimization period. These records shall be maintained on-site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-59.~~

AQ-28 ~~Deleted.~~The emissions during the Optimization Period shall not exceed any of the following concentration limits, corrected to 15% oxygen on a dry basis, as determined by the Continuous Emissions Monitoring System (GEMS) and the District approved CO/VOC surrogate relationship, as well as the limits specified in Condition Nos. 17, 18, 19, 20, 21, 22, and 23:

| <u>Pollutant</u> | <u>Emission Limit, ppmvd</u> |
|---|------------------------------|
| Oxides of Nitrogen, NOx (calculated as NO2) | 2.0 (24-hr. average) |
| Carbon Monoxide, CO | 10.0 (3-hr. average) |
| Volatile Organic Compounds, VOC | 2.0 (3-hr. average) |

~~Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine when operating during the optimization period. These records shall be maintained on-site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-59.~~

AQ-29 ~~Deleted.~~If the equipment is unable to meet the emission requirements of the Optimization Period, (with the exception of the 1.0 ppmvd target emission limit for NOx), the District or the project owner may end the Optimization

~~Period, in writing. In such case, the project owner shall replace the SCONOx system with a selective catalytic reduction (SCR) system combined with an oxidation catalyst system, as approved by the District, and enter into the Replacement Period. A District decision to end the Optimization Period may be appealed to the District Hearing Board.~~

~~Verification: The project owner shall written notice the District and the CEC CPM of termination of the Optimization Period and the intent to replace the SCONOx system with SCR/oxidation catalyst systems.~~

AQ-30 ~~Deleted.~~ During the Optimization Period, the project owner shall submit a written 60-calendar day and 120-calendar day progress report to the District. This report shall include, at a minimum, the emissions of NOx and CO during startup and continuous steady-state operation with and without power augmentation. These reports shall also detail any turbine or emission control equipment malfunction, upsets, repairs, maintenance, modifications, or replacements affecting emissions of air contaminants that occurred during the Optimization Period. These reports shall also describe all planned actions and tests to be conducted during the Optimization Period. Each report shall be submitted to the District, in writing, within 10 calendar days after the end of the 60-day and 120-day periods. In the event that the equipment cannot meet the requirements for on-going operations at the end of the Optimization Period, a final written report shall be submitted to the District within 10 calendar days after the end of the Optimization Period. This report shall include, at a minimum, the lowest sustainable NOx and CO concentrations observed during the Optimization Period and the reasons that the equipment could not meet the requirements for on-going operations.

~~Verification: The project owner shall submit an Optimization Period Progress Report for each gas turbine to the District and the CPM no later than 10 days after calendar day 60 and calendar day 120 of the optimization period of each gas turbine.~~

REPLACEMENT PERIOD CONDITIONS

AQ-31 ~~Deleted.~~ In the event that the equipment cannot meet the requirements for on-going operations, the Replacement Period shall begin immediately upon the end of the Optimization Period and shall end upon completion of the installation of the selective catalytic reduction (SCR) system and the oxidation catalyst. The Replacement Period shall not exceed 90 days.

~~Verification: The project owner shall notify the District and the CPM that the SCONOx system cannot meet permit limits no later than 10 days after calendar day 120 of the optimization period. The project owner shall install a fully operational selective catalytic reduction (SCR) system within 90 days of the notification.~~

AQ-32 ~~Deleted.~~ During the Replacement Period, the concentrations of oxides of nitrogen (NOx), calculated as nitrogen dioxide, the concentrations of carbon monoxide (CO), and the concentrations of volatile organic compounds (VOCs) shall not exceed the lowest sustainable concentrations observed during the Optimization Period, as determined by the District. Additionally, the emission limits specified in Condition Nos. AQ-17, -18, -19, -20, -21, -22, -23, -42, -43, -44, -45, -46, -47, and -48 shall apply.

~~Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine when operating during the replacement period. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-59.~~

AQ-33 ~~Deleted.~~ Before operating an SCR system, continuous monitors shall be installed on each turbine to monitor or calculate and record the following:

- ~~• ammonia stack concentration (ppmvd, corrected to 15% oxygen), and~~
- ~~• ammonia injection rate (lbs/hr).~~

~~The monitors shall be installed, calibrated, and maintained in accordance with an approved protocol. This protocol, which shall include calculation methodology, shall be submitted to the District for written approval at least 60 days prior to initial firing of the gas turbines with the SCR system. The monitors shall be in full operation at all times when the turbine is in operation.~~

~~Verification: The project owner shall provide copies of the CEMS installation, calibration and maintenance protocol, including the calculation methodology, to the District, for written approval, and the CPM at least 60 days prior to initial firing of the gas turbines with the SCR system.~~

AQ-34 ~~Deleted.~~ If an SCR system is used for emission control, the emissions of ammonia (slippage) from each gas turbine exhaust stack, if controlled with an SCR system, shall not exceed 10.0 parts per million by volume on a dry basis (ppmvd) corrected to 15% oxygen.

~~Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine when operating. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.~~

CONDITIONS FOR ON-GOING OPERATIONS

AQ-35 For the purposes of the District's Determination of Compliance and Authority to Construct, the period described as "on-going" operation of the turbines shall commence immediately following the end of the ~~Optimization Period, or Replacement Period if required, or immediately upon the end of the Commissioning Period if the applicant elects to install an SCR system.~~ Condition Nos. AQ-10, -13, -17, -18, -19, -20, -21, -22 and ~~-80, and -81~~²³ shall continue to apply during on-going operations.

Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine when operating. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-36 The emissions of oxides of nitrogen (NO_x) from each turbine, calculated as nitrogen dioxide, shall not exceed 2.0 parts per million by volume on a dry basis (ppmvd) corrected to 15% oxygen. Compliance with the limit shall be based on CEMS data for each unit and averaged over each rolling continuous ~~3-hour~~ 1-hour period, excluding ~~time~~ hours when the equipment is operated under startup or shutdown conditions and time that the equipment is not in operation. Compliance with this limit shall also be verified through an initial source test and annual source testing thereafter. This limit shall not apply to the first fifteen 1-hour average NO_x emissions measurements above 2.0 ppmvd corrected to 15% oxygen in any rolling 12-month period for each gas turbine provided the following requirements are met:

- a. This equipment operates under any one of the following:
 - i) Rapid combustion turbine load changes due to the following conditions:
 - A) Load changes initiated by the California Independent Systems Operator (ISO) or a successor entity when the plant is operating under Automatic Generation Control; or
 - B) Activation of a plant automatic safety or equipment protection system which rapidly decreases turbine load
 - ii) The first two 1-hour reporting periods following the initiation or shutdown of a system injection pump
 - iii) The first two 1-hour reporting periods following the initiation of HRSG duct burners
 - iv) Events as the result of technological limitation identified by the operator and approved in writing by the District.

- b. The 1-hour average NO_x emissions above 2.0 ppmvd corrected to 15% oxygen did not occur as a result of operator neglect, improper operation or maintenance, or qualified breakdown under District Rule 98.

- c. The qualified operating conditions described in (a) above are recorded in the plant's operating log within 24 hours of the event, and in the CEMS by 5:00 pm the next business day following the qualified operating condition. The notations in the log and CEMS shall describe the data and time of entry into the log/CEMS and the plant operating conditions responsible for NO_x emissions exceeding the 2.0 ppmvd 1-hour average limit.

d. The 1-hour average NOx concentration for periods that result from a qualified operating condition does not exceed 25 ppmvd corrected to 15% oxygen.

All NOx emissions during these events shall be included in all calculations of hourly, daily, and annual mass emission rates as required by this FDOC.

Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine when operating. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition, including documentation of compliance of any NOx limit excursions that are allowed under this condition, shall be included in the quarterly reports required in Condition AQ-62.

AQ-37 The emissions of carbon monoxide (CO) from each turbine shall not exceed 6.0 parts per million by volume on a dry basis (ppmvd) corrected to 15% oxygen. Compliance with these limits shall be based on CEMS data for each unit and averaged over each rolling continuous 3-hour period, excluding hours-time when the equipment is operated under startup or shutdown conditions and time that the equipment is not in operation. Compliance with this limit shall also be verified through an initial emissions source test and at least annual source testing thereafter.

Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine when operating. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-38 The emissions of volatile organic compounds (VOC) from each turbine, calculated as methane, shall not exceed 2.0 parts per million by volume on a dry basis (ppmvd) corrected to 15% oxygen. Compliance with this limit shall be based on the CO CEMS data for each unit, averaged over each rolling continuous 1-hour period or portion thereof, excluding time when the equipment is operated under startup or shutdown conditions and time that the equipment is not in operation, emission limits and the District approved CO/VOC surrogate relationship. The CO/VOC surrogate relationship shall be verified and/or modified, if necessary, based on an initial emissions source test and at least annual source testing thereafter, deemed compliance with the VOC emission limits.

Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine when operating. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the

Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-39 When operated without ~~duct firing power augmentation~~, the emissions from each turbine shall not exceed the following emission limits, except during startup and shutdown conditions, as determined by the Continuous Emissions Monitoring System (CEMS) and continuous monitors and/or District approved emission source testing. Compliance with the NOx and CO limits shall be based on a rolling continuous 3-hour averaging period and compliance with the VOC limit shall be based on a rolling continuous 1-hour averaging period:

| <u>Pollutant</u> | <u>Emission Limit, lbs/hr</u> |
|---|-------------------------------|
| Oxides of Nitrogen, NOx (calculated as NO2) | 13.14 14.0 |
| Carbon Monoxide, CO | 24.02 29.4 |
| Volatile Organic Compounds, VOC | 4.58 3.4 |

Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine when operating without ~~duct firing power augmentation~~. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-40 When operated with ~~duct firing power augmentation~~, the emissions from this equipment shall not exceed the following emission limits, except during startup or shutdown conditions, -as determined by the Continuous Emissions Monitoring System (CEMS), the District approved CO/VOC surrogate relationship, and continuous monitors and/or District approved emission source testing. Compliance with the NOx and CO limits shall be based on a rolling continuous 3-hour averaging period and compliance with the VOC limit shall be based on a rolling continuous 1-hour averaging period.:

| <u>Pollutant</u> | <u>Emission Limit, lbs/hr</u> |
|---|-------------------------------|
| Oxides of Nitrogen, NOx (calculated as NO2) | 15.95 14.9 |
| Carbon Monoxide, CO | 29.13 27.4 |
| Volatile Organic Compounds, VOC | 5.56 3.3 |

Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine when operating with ~~duct firing power augmentation~~. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-41 ~~This equipment shall not operate with power augmentation for more than 1800 hrs per turbine per rolling 365-day period~~Fuel consumption by the duct burners for both turbines shall not exceed 3,881,000 MMBtu (HHV) per rolling 12-month period. Each time one or both turbines are operated with duct firing the CEMS shall record the total duct burner fuel usage for each rolling 12-month period (in MMBtu). The project owner shall maintain a log that contains, at a minimum, the dates and fuel usage ~~time~~ when one or both turbines are operated with ~~power augmentation~~duct firing. ~~This log~~These records shall be maintained on site for a minimum of five years and made available to District personnel upon request.

Verification: The project owner shall maintain records of the operation of the gas turbine with duct firing~~power augmentation~~. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-42 When operated under ~~hot/warm~~ startup conditions, the emissions from each turbine shall not exceed the following emission limits, averaged over each rolling continuous 1-hour period, as determined by the Continuous Emissions Monitoring System (CEMS), the District approved CO/VOC surrogate relationship, and continuous monitors and/or District approved emission source testing:

| <u>Pollutant</u> | <u>Emission Limit, lbs/hr</u> |
|---|-------------------------------|
| Oxides of Nitrogen, NOx (calculated as NO2) | 240.044.0 |
| Carbon Monoxide, CO | 2706600 |
| Volatile Organic Compounds, VOC | 48.039.0 |

Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine when operating during startup condition~~the replacement period~~. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-43 When operated under ~~cold~~ startup or shutdown conditions, the emissions from each turbine shall not exceed the following emission limits, averaged over each rolling continuous 1-hour period~~totalled per event~~, as determined by the Continuous Emissions Monitoring System (CEMS), the District approved CO/VOC surrogate relationship, and continuous monitors and/or District approved emission source testing:

| <u>Pollutant (during startups)</u> <u>hour), lbs/event</u> | <u>Emission Limit, (first</u> |
|---|-------------------------------|
| Oxides of Nitrogen, NOx (calculated as NO2) | 48044.0 |
| Carbon Monoxide, CO | 5412887 |
| Volatile Organic Compounds, VOC | 9649.0 |

| Pollutant (during shutdowns) | Emission Limit, lbs/event |
|---|---------------------------|
| Oxides of Nitrogen, NOx (calculated as NO2) | 80 |
| Carbon Monoxide, CO | 902 |
| Volatile Organic Compounds, VOC | 16 |

Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine when operating during startup and shutdown condition~~the replacement period~~. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-44 ~~Hot/warm-s~~Startup for each gas turbine shall be defined as the period beginning with the introduction of fuel to the equipment and ending when the CEMS records two consecutive data points in compliance with the emission concentration limits of Condition AQ-36, -37 and -38 for the gas turbine, not to exceed 6.0 hours~~time necessary to meet the emission limits specified in Conditions 36 and 37, not to exceed 0.75 hours, after an initial firing following a shutdown period of less than 48 hours. The total time operating under hot/warm startup conditions shall not exceed 30 hours per calendar year for each turbine.~~

Verification: The project owner shall maintain records of the duration of ~~hot/warm~~ startups ~~and shutdowns~~ of each gas turbine. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-45 ~~Cold startup~~Shutdown for each gas turbine shall be defined as the period beginning when the CEMS records a single data point not in compliance with the emission concentration limits of Condition AQ-36, -37 and -38 and ending with the termination of fuel flow to the gas turbine, not to exceed 1.0 hours~~the time necessary to meet the emission limits specified in Conditions 36 and 37, not to exceed 2.0 hours, after an initial firing following a shutdown period of greater than or equal to 48 hours. The total time operating under cold start conditions shall not exceed 20 hours per calendar year for each turbine.~~

Verification: The project owner shall maintain records of the duration of ~~cold startup~~shutdowns of each gas turbine. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-46 Both gas turbines shall not be operated simultaneously in ~~cold~~ startup mode. Additionally, the auxiliary boiler shall not be operated in startup mode simultaneously with either turbine.

Verification: The project owner shall maintain records of the duration of ~~cold~~ startups of each gas turbine and the auxiliary boiler. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-47 The project owner shall maintain a log of all startups and shutdowns for each turbine and the auxiliary boiler. The log shall contain, at a minimum, ~~the type of startup~~, the dates and times of each startup or shutdown, and the duration of each startup or shutdown. This log shall be maintained on site for a minimum of five years and made available to District personnel upon request.

Verification: The project owner shall maintain records of the duration of all startups and shutdowns of each gas turbine. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-48 The emissions of particulate matter less than 10 microns (PM₁₀) shall not exceed ~~9.049.4~~ lbs/hr when operated without duct firing and shall not exceed 11.5 lbs/hr for each turbine when operated with duct firing. Compliance with this limit shall be based on an initial emissions source compliance test and at least annual source testing thereafter.

Verification: The project owner shall provide copies of the initial emissions source test compliance and annual source test reports to the District and the CEC CPM within 60 days after completion of the compliance or source tests.

AQ-49 Within 30 days after completion of the ~~Optimization Period or Replacement Period (if needed) if the project owner elects to install a SCONox system or within 30 days after completion of the~~ Commissioning Period ~~if the project owner elected to install an SCR system~~, an initial emissions source test shall be conducted on each turbine and on the auxiliary boiler by an independent, ARB approved tester at the project owner's expense to show compliance with all applicable emission limits. A source test protocol shall be submitted to the District for written approval at least 60 days prior to source testing. The source test protocol shall comply with the following requirements:

- a. Measurements of oxides of nitrogen (NO_x), carbon monoxide (CO), and stack gas oxygen content shall be conducted in accordance with the San Diego Air Pollution Control District Method 100, or equivalent, as approved by the U.S. Environmental Protection Agency (EPA).
- b. Measurements of particulate matter less than 10 microns shall be conducted in accordance with the U.S. Environmental Protection

- Agency (EPA) Methods 201A and 202, or equivalent, as approved by the U.S. Environmental Protection Agency (EPA).
- c. Measurements of volatile organic compounds (VOC) shall be conducted in accordance with San Diego Air Pollution Control District Methods 18 and 25A, or equivalent, as approved by the U.S. Environmental Protection Agency (EPA).
 - d. Source testing shall be performed at no less than 80% of the turbine rating ~~without power augmentation duct firing, at no less than 80% of the turbine rating with duct firing, and at not less than 80% of the auxiliary boiler rating.~~ If the project owner demonstrates to the satisfaction of the District that the turbine cannot operate at these conditions, then the source testing shall be performed at the highest achievable continuous power rating.
 - e. The following additional operating characteristics shall also be measured or calculated and recorded:
 - natural gas flow rate (scfh),
 - fuel higher heating value (Btu/scf),
 - heat input rate (MMBtu/hr),
 - exhaust gas flow rate (dscfm),
 - exhaust gas temperature (°F),
 - power output (gross MW), if applicable.

Verification: The project owner shall provide copies of the source test protocol to the District, written approval, and the CPM at least 60 days prior to source testing.

AQ-50 Within 30 days after completion of the ~~Optimization Period or Replacement Period (if needed) if the project owner elects to install a SCONox system or within 30 days after completion of the~~ Commissioning Period ~~if the project owner elected to install an SCR system,~~ an initial emissions source test shall be conducted by an independent, ARB approved tester at the project owner's expense to determine the emissions of toxic air contaminants and federal hazardous air pollutants (HAPs). A source test protocol shall be submitted to the District for written approval at least 60 days prior to source testing. The source test shall demonstrate compliance with the following limits (for each turbine):

| <u>Pollutant</u> | <u>Emission Limit, lbs/hr</u> |
|--|-------------------------------|
| Acetaldehyde | <u>0.090.08</u> |
| Acrolein | <u>0.010.03</u> |
| Benzene | <u>0.030.015</u> |
| Ethyl Benzene | <u>0.070.02</u> |
| Formaldehyde | <u>0.292.33</u> |
| Naphthalene | <u>3.66E-30.0019</u> |
| Polyaromatic Hydrocarbons (PAHs) <u>(excluding naphthalene)</u> | <u>3.4E-40.0017</u> |
| Toluene | <u>0.290.08</u> |
| Xylene | <u>0.140.03</u> |

Verification: The project owner shall provide copies of the source test protocol to the District, for written approval, and the CPM at least 60 days prior to source testing.

AQ-53 This equipment shall be source tested on at least an annual basis to show continued compliance with all applicable emission limits, unless otherwise directed in writing by the District. If this testing will be performed by someone other than the District, a source test protocol shall be submitted to the District for written approval at least 60 days prior to source testing. The source test protocol shall comply with the following requirements:

- a. Measurements of oxides of nitrogen (NO_x), carbon monoxide (CO), and stack gas oxygen content shall be conducted in accordance with the San Diego Air Pollution Control District Method 100, or equivalent, as approved by the U.S. Environmental Protection Agency (EPA).
- b. Measurements of particulate matter less than 10 microns shall be conducted in accordance with the U.S. Environmental Protection Agency (EPA) Methods 201A and 202, or equivalent, as approved by the U.S. Environmental Protection Agency (EPA).
- c. Measurements of volatile organic compounds (VOC) shall be conducted in accordance with San Diego Air Pollution Control District Methods 18 and 25A, or equivalent, as approved by the U.S. Environmental Protection Agency (EPA).
- d. Source testing shall be performed at no less than 80% of the turbine rating without ~~power augmentation~~ duct firing, at no less than 80% of the turbine rating with duct firing, and at not less than 80% of the auxiliary boiler rating. If the project owner demonstrates to the satisfaction of the District that the turbine cannot operate at these conditions, then the source testing shall be performed at the highest achievable continuous power rating.
- e. The following additional operating characteristics shall also be measured or calculated and recorded:
 - natural gas flow rate (scfh),
 - fuel higher heating value (Btu/scf),
 - heat input rate (MMBtu/hr),
 - exhaust gas flow rate (dscfm),
 - exhaust gas temperature (°F),
 - power output (gross MW), if applicable.

Verification: This project owner provide copies of the annual source test reports to the District for review and written approval, and the CPM within 60 days after the completion of the initial compliance testing.

EMISSION OFFSET CONDITIONS

AQ-59 No later than 20 years after the initial firing of the equipment, the emissions of oxides of nitrogen (NO_x) shall not exceed 1.0 parts per million by volume on a dry basis (ppmvd) corrected to 15% oxygen. Compliance with this limit shall be based on CEMS data for each unit and averaged over each 3-hour period, excluding hours when the equipment is operated under any startup

condition. Additionally, the total annual emissions of oxides of nitrogen (NOx), calculated as nitrogen dioxide, shall not exceed 50 tons per rolling 12-month period. Compliance with this limit shall be verified using the CEMS system on each gas turbine (Application Nos. 973880 and 973881)

Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine during commissioning, ~~startup/shutdown, optimization, replacement~~ and operation. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

ADDITIONAL GENERAL CONDITIONS

AQ-60 For each emission limit expressed as pounds per hour or parts per million based on a 1-hour averaging period, compliance shall be based on each rolling continuous 1-hour period using data collected at least once every 15 minutes when compliance is based on continuous emissions monitoring data.

Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine during commissioning, ~~startup/shutdown, optimization, replacement~~ and operation. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. Quarterly reports shall be sent to the CEC CPM within 60 days after each calendar quarter.

AQ-61 For each emission limit expressed as pounds per hour or parts per million based on a 3-hour averaging period, compliance shall be based on each rolling continuous 3-hour period using data collected at least once every 15 minutes when compliance is based on continuous emissions monitoring data.

Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine during commissioning, ~~startup/shutdown, optimization, replacement~~ and operation. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. Quarterly reports shall be sent to the CEC CPM within 60 days after each calendar quarter.

AQ-62 All records required by these conditions shall be maintained on site for a minimum of five years and made available to District personnel upon request. In addition, quarterly reports of information recorded by these conditions, as specified, shall be sent to the CPM.

Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine during commissioning, ~~startup/shutdown, optimization, replacement~~ and operation. These records shall be maintained on

site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. Quarterly reports shall be sent to the CEC CPM within 60 days after each calendar quarter.

AQ-65 The project owner shall submit an application to the District for a Federal (Title V) Operating Permit, in accordance with District Regulation XIV44 within 12 months of initial startup of this equipment.

Verification: The project owner shall submit an application for a Title V Operating Permit to the District, and provide a copy of the application to the CPM, within 12 months prior to the initial startup.

CONDITIONS OF CERTIFICATION numbers AQ-66 through AQ-69 are reserved for future use.

PROPOSED NEW AIR QUALITY ENERGY COMMISSION STAFF CONDITIONS OF CERTIFICATION

These conditions are not included in the District's Determination of Compliance.

AQ-77 The emissions of particulate matter less than 10 microns (PM10) from the Wet Surface Air Cooler shall not exceed 0.1 lbs/hr, based on design specifications limiting circulating water flow rates to no more than 5 million gallons per hour and warranties limiting drift to no more than 0.0006% of the circulating water flow.

Verification: The project owner shall provide copies of Wet Surface Air Cooler specifications and a vendor warranty of the drift efficiency to the CPM 60 days prior to WSAC equipment delivery on-site.

AQ-78 Compliance with the WSAC PM₁₀ emission limit shall be determined by circulating water sample analysis by independent laboratory within 60 days of initial operation and quarterly thereafter.

Verification: The results and field data collected from cooling tower blowdown water samples analysis shall be submitted to the CPM and the District as part of the quarterly reports required in Condition AQ-62.

AQ-79 The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project air permit. The project owner shall submit to the CPM any modification to any permit proposed by the District or EPA, and any revised permit issued by the District or EPA, for the project.

Verification: The project owner shall submit any proposed air permit modification to the CPM within five working days of its submittal either by 1) the project owner to an agency, or 2) receipt of proposed modifications from an agency.

The project owner shall submit all modified air permits to the CPM within 15 days of receipt.

PROPOSED NEW DISTRICT DETERMINATION OF COMPLIANCE CONDITIONS

AQ-80 The total aggregate emissions of volatile organic compounds (VOC) from all emission units at the stationary source shall not exceed 47.5 tons for each consecutive 12-calendar month period. The VOC emissions shall begin accruing at the initial firing of each piece of equipment. Compliance shall be verified using testing results, EPA- or ARB-certified VOC emissions factors, and/or other representative emissions information for all other combustion equipment, including the auxiliary boiler.

Verification: The project owner shall maintain records, at least on a calendar monthly basis, of total aggregate mass emissions of VOC, in tons per year, from all equipment, excluding exempt equipment, at this stationary source for the previous 12-month period. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-81 To ensure compliance with District Rule 69.2 and except during any period of time for which a variance from Rule 69.2 has been granted by the Air Pollution Control District Hearing Board, the emissions of oxides of nitrogen (NOx), calculated as nitrogen dioxide, from the auxiliary boiler shall not exceed 30 parts per million by volume on a dry basis (ppmvd) calculated over a 1-hour averaging period and corrected to 3% oxygen and the emissions of carbon monoxide (CO) from the auxiliary boiler shall not exceed 400 parts per million by volume on a dry basis (ppmvd) calculated over a 1-hour averaging period and corrected to 3% oxygen.

Verification: The project owner shall maintain records of the NOx and CO emission concentrations from the auxiliary boiler for all operating conditions. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-82 Continuous monitors shall be installed on each turbine to monitor or calculate and record the following:

- ammonia stack concentration (ppmvd, corrected to 15% oxygen), and
- ammonia injection rate (lbs/hr).

The monitors shall be installed, calibrated, and maintained in accordance with an approved protocol. This protocol, which shall include calculation methodology, shall be submitted to the District for written approval at least 60 days prior to initial firing of the gas turbines with the SCR system. The

monitors shall be in full operation at all times when the turbine is in operation.

Verification: The project owner shall provide copies of the CEMS installation, calibration and maintenance protocol, including the calculation methodology, to the District, for written approval, and the CPM at least 60 days prior to initial firing of the gas turbines with the SCR system.

AQ-83 The emissions of ammonia (slippage) from each gas turbine exhaust stack shall not exceed 10.0 parts per million by volume on a dry basis (ppmvd) corrected to 15% oxygen and averaged over a rolling continuous 1-hour period.

Verification: The project owner shall maintain records of the mass emissions and concentrations of each gas turbine when operating. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-84 Fuel consumption by the auxiliary boiler shall not exceed 762,120 MMBtu (HHV) per rolling 12-month period. The CEMS shall record the total auxiliary boiler fuel usage for each rolling 12-month period (in MMBtu). The project owner shall maintain a log that contains, at a minimum, the dates, times and fuel consumption during each auxiliary boiler startup and shutdown and the total auxiliary boiler fuel consumption for each rolling 12-month period. These records shall be maintained on site for a minimum of five years and made available to District personnel upon request.

Verification: The project owner shall maintain records of the operation of the auxiliary boiler. These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information gathered in this condition shall be included in the quarterly reports required in Condition AQ-62.

AQ-85 Once final selection and design details of the auxiliary boiler have been submitted to the District, specific operating parameters defining auxiliary boiler startups and shutdowns shall be established.

Verification: At least 90 days prior to on-site delivery of equipment, the project owner shall provide copies of design details of the auxiliary boiler, including any proposed post-combustion control systems, to the CPM and the District.

AQ-86 The emissions of oxides of nitrogen (NOx) from the auxiliary boiler, calculated as nitrogen dioxide, shall not exceed 9.0 parts per million by volume on a dry basis (ppmvd) corrected to 3% oxygen. Compliance with this limit shall be based on an initial emissions source test and annual

source testing thereafter. The limit shall not apply during startups and shutdowns of the auxiliary boiler.

Verification: The project owner shall provide copies of the initial emissions source test and annual source test reports to the District and the CEC CPM within 60 days after completion of the compliance or source tests.

AQ-87 The emissions of carbon monoxide (CO) from the auxiliary boiler shall not exceed 50 parts per million by volume on a dry basis (ppmvd) corrected to 3% oxygen. Compliance with this limit shall be based on an initial emissions source test and annual source testing thereafter. The limit shall not apply during startups and shutdowns of the auxiliary boiler.

Verification: The project owner shall provide copies of the initial emissions source test and annual source test reports to the District and the CEC CPM within 60 days after completion of the compliance or source tests.

AQ-88 The emissions of volatile organic compounds (VOC) from the auxiliary boiler, calculated as methane, shall not exceed 10.0 parts per million by volume on a dry basis (ppmvd) corrected to 3% oxygen. Compliance with this limit shall be based on an initial emissions source test and annual source testing thereafter. The limit shall not apply during startups and shutdowns of the auxiliary boiler.

Verification: The project owner shall provide copies of the initial emissions source test and annual source test reports to the District and the CEC CPM within 60 days after completion of the compliance or source tests.

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