# AIR QUALITY

Matt Layton

## INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the construction and operation of the proposed combined cycle units at the Otay Mesa Generating Project (OMGP). Criteria air pollutants are defined as those for which a state or federal ambient air quality standard has been established to protect public health. They include nitrogen dioxide (NO2), sulfur dioxide (SO2), carbon monoxide (CO), ozone (O3), volatile organic compounds (VOC) and particulate matter less than 10 microns in diameter (PM10).

In carrying out this analysis, the California Energy Commission staff evaluated the following major points:

- whether the combined cycle units at the Otay Mesa Generating Project are likely to conform with applicable Federal, State and San Diego County Air Pollution Control District air quality laws, ordinances, regulations and standards, as required by Title 20, California Code of Regulations, section 1742.5 (b);
- whether the combined cycle units at the Otay Mesa Generating Project are likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards, as required by Title 20, California Code of Regulations, section 1742 (b); and
- whether the mitigation proposed for the combined cycle units at the Otay Mesa Generating Project are adequate to lessen the potential impacts to a level of insignificance, as required by Title 20, California Code of Regulations, section 1744 (b).

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

## FEDERAL

Under the Federal Clean Air Act (40 CFR 52.21), there are two major components of air pollution law, New Source Review (NSR) and Prevention of Significant Deterioration (PSD). NSR is a regulatory process for evaluation of those pollutants that violate federal ambient air quality standards. Conversely, PSD is a regulatory process for evaluation of those pollutants that do not violate federal ambient air quality standards. The NSR and PSD analyses have been delegated by the United States Environmental Protection Agency (EPA) to the San Diego County Air Pollution Control District (District). The PSD requirements apply only to those projects (known as major sources) that exceed 100 tons per year for any pollutant.

## STATE

The California State Health and Safety Code, section 41700, requires that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerate number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property."

## LOCAL

The proposed project is subject to the San Diego County Air Pollution Control District (District) rules and regulations. The rules and regulations are discussed in the Preliminary Determination of Compliance (PDOC) issued June 22, 2000 (District 2000b). Rules that apply to the Project are summarized below. The rules and the project's compliance with them are described more fully in the PDOC.

### *RULE 20.1 AND 20.3 - NEW SOURCE REVIEW (MAJOR STATIONARY SOURCES AND PSD SOURCES):*

#### RULE 20.3(D)(1) - BEST AVAILABLE CONTROL TECHNOLOGY/LOWEST ACHIEVABLE EMISSION RATE:

This subsection of the rule requires that Best Available Control Technology (BACT) be installed on a pollutant specific basis if emissions exceed 10 lbs/day for each criteria pollutant (except for CO for which the PSD BACT threshold is 100 tons/yr). This subsection also requires that Lowest Achievable Emission Rate (LAER) be installed on a pollutant specific basis if the emissions exceed 50 tons/yr for NOx (oxides of nitrogen which is the sum of NO2 and nitrogen oxide [NO] emissions) or VOC emissions.

Because the District is in attainment status for the national ambient air quality standards for CO, SOx (SO2 and sulfur compounds), and PM10, LAER does not apply to these particular pollutants (District Rule 20.3(d)(1)(v)). However, BACT does apply for NOx, VOC, SOx, and PM10 since the District is in non-attainment for the state ambient air quality standards for ozone, for which NOx and VOC emissions are precursors, and PM10 (District Rule 20.3(d)(1)(i)). Additionally BACT applies for CO and PM10 if they trigger PSD major source thresholds of 100 tons/yr (District Rule 20.3(d)(1)(vi)).

Based on emission estimates for the OMGP, LAER is triggered for NOx and BACT is triggered for CO, VOC, SOx, and PM10.

#### RULE 20.3(D)(2) - AIR QUALITY IMPACT ANALYSIS (AQIA):

This portion of the rule requires that an AQIA be performed for air contaminants which exceed the trigger levels of Table 20.3-1 of the District's Rules and Regulations. An AQIA is triggered for NOx, CO, and PM10 for this project.

**RULE 20.3(D)(3) - PREVENTION OF SIGNIFICANT DETERIORATION (PSD):**

This portion of the rule requires that a PSD evaluation be performed for all contaminants which exceed PSD major source trigger levels. PSD is triggered for $NO_2$, CO, and $PM_{10}$ for the OMGP.

**RULE 20.3(D)(4) - PUBLIC NOTICE AND COMMENT:**

This portion of the rule requires the District to publish a notice of the proposed action in at least one newspaper of general circulation in San Diego County as well as send notices to the EPA and the California Air Resources Board (CARB). The District must allow at least 30 days for public comment and consider all comments submitted. The District must also make all information regarding the evaluation available for public inspection. The public notice and comment period was initiated on June 22, 2000 when the Preliminary Determination of Compliance (PDOC) was submitted to the CEC.

**RULE 20.3(D)(5) - EMISSION OFFSETS:**

This portion of the rule requires that emissions of any federal non-attainment criteria pollutant or its precursors which exceed major source thresholds be offset with actual emission reductions. Of the six criteria pollutants, ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, PM10, and lead, the District is a federal non-attainment area only for ozone. Therefore, offsets are potentially only required for NOx and VOC emissions, as ozone precursors. However, VOC emissions are expected to be below major source levels (50 tons/yr). Therefore, only offsets for NOx emissions are required for the OMGP per the District rules.

**RULE 20.5 - POWER PLANTS:**

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

**RULE 50 - VISIBLE EMISSIONS:**

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

**RULE 51 - NUISANCE:**

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

**RULE 53 - SPECIFIC AIR CONTAMINANTS:**

This rule limits emissions of sulfur compounds (calculated as SO2) to less than or equal to 0.05%, by volume, on a dry basis. This rule also limits particulate matter emissions from gaseous fuel combustion to less than or equal to 0.1 grains per dry standard cubic foot of exhaust calculated at 12% CO2.

**RULE 68 - OXIDES OF NITROGEN FROM FUEL BURNING EQUIPMENT:**

This rule limits NOx emissions from any fuel burning equipment to less than 125 parts per million by volume (ppmv) calculated as $NO_2$ at 3% oxygen on a dry basis.

**RULE 69.3 - STATIONARY GAS TURBINES - REASONABLY AVAILABLE CONTROL TECHNOLOGY:**

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

**RULE 69.3.1 - STATIONARY GAS TURBINES - BEST AVAILABLE RETROFIT CONTROL TECHNOLOGY:**

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

**RULE 1200 - TOXIC AIR CONTAMINANTS, NEW SOURCE REVIEW:**

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

## ENVIRONMENTAL SETTING

## METEOROLOGICAL CONDITIONS

The semi-permanent Pacific High over the eastern Pacific Ocean dominates the climate at the project site. San Diego County has a subtropical climate. The summers are typically cool and winters warm in comparison. Ambient temperatures are rarely below freezing or over 100$^{o}$F. Peak temperatures increase as you move away from the coast. During the winter months, the Pacific High weakens and migrates to the south allowing Pacific storms into California. Most of the annual rainfall of 10.6 inches occurs between November and March (OMGP 1999).

Wind and sunlight affect dispersion of onsite air pollutant emissions and the transport of air pollution to and from the site. Quarterly wind roses can be found in the Application for Certification (OMGP 1999). Winds are generally from the northwest quadrant year round. This wind pattern and upper level transport are the dominant transport mechanism for air pollution from the South Coast (Los Angeles) air basin to the San Diego air basin. There are occasional easterly winds occurring in the 4$^{th}$ and 1$^{st}$ quarters. Occasional southerly winds in the 1$^{st}$ quarter can transport air pollution from Mexico.

Along with the winds, another climatic factor is atmospheric stability and mixing height. Atmospheric stability is an indicator of the air turbulence and mixing. During the daylight hours of the summer when the earth is heated and air rises, there is more turbulence, more mixing and thus less stability. During these conditions there is more air pollutant dispersion and therefore usually fewer direct[1] air quality impacts from a single air pollution source like the OMGP. During the winter months between storms, very stable atmospheric conditions can occur, resulting in very little mixing. Under these conditions, little air pollutant dispersion occurs, and consequently higher air quality impacts can result from stationary and mobile source emissions. Mixing heights are generally lower during the winter, along with lower mean wind speeds and less vertical mixing.

## EXISTING AIR QUALITY

The Federal Clean Air Act and the California Air Resources Board (CARB) both required the establishment of allowable maximum ambient concentrations of air pollutants, called ambient air quality standards (AAQS). The state AAQS, established by CARB, are typically lower (more protective) than the federal AAQS, which are established by the federal Environmental Protection Agency (USEPA). The state and federal air quality standards are listed in Air Quality Table 1. As indicated in Air Quality Table 1, the averaging times for the various air quality standards (the duration over which they are measured) range from one-hour to an annual average. The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per a volume of air, in milligrams or micrograms of pollutant in a cubic meter of air ($mg/m^3$ and $\mu g/m^3$).

In general, an area is designated as attainment for a specific pollutant if the measured concentrations of that air contaminant do not exceed the standard. Likewise, an area is designated as non-attainment for an air contaminant if that standard is violated. Where not enough ambient data are available to support designation as either attainment or non-attainment, the area can be designated as unclassified. Unclassified areas are normally treated the same as attainment areas for regulatory purposes. An area can be attainment for one air contaminant while non-attainment for another, or attainment for the federal standard and non-attainment for the state standard for the same contaminant. The entire area within the boundaries of a district is usually evaluated to determine the district's attainment status.

[1] Direct impacts refer to those impacts from air pollutants in the plume. Ozone is not directly emitted from a power plant.

**Air Quality Table 1**
**Federal and State Ambient Air Quality Standards**

| Pollutant | Averaging Time | Federal Standard | California Standard |
|---|---|---|---|
| Ozone (O3) | 1 Hour | 0.12 ppm (235 μg/m$^3$) | 0.09 ppm (180 μg/m$^3$) |
| Carbon Monoxide (CO) | 8 Hour | 9 ppm (10 mg/m$^3$) | 9 ppm (10 mg/m$^3$) |
| | 1 Hour | 35 ppm (40 mg/m$^3$) | 20 ppm (23 mg/m$^3$) |
| Nitrogen Dioxide (NO2) | Annual Average | 0.053 ppm (100 μg/m$^3$) | --- |
| | 1 Hour | --- | 0.25 ppm (470 μg/m$^3$) |
| Sulfur Dioxide (SO2) | Annual Average | 80 μg/m$^3$ (0.03 ppm) | --- |
| | 24 Hour | 365 μg/m$^3$ (0.14 ppm) | 0.04 ppm (105 μg/m$^3$) |
| | 3 Hour | 1300 μg/m$^3$ (0.5 ppm) | --- |
| | 1 Hour | --- | 0.25 ppm (655 μg/m$^3$) |
| Respirable Particulate Matter (PM10) | Annual Geometric Mean | --- | 30 μg/m$^3$ |
| | 24 Hour | 150 μg/m$^3$ | 50 μg/m$^3$ |
| | Annual Arithmetic Mean | 50 μg/m$^3$ | --- |
| Sulfates ($SO_4$) | 24 Hour | --- | 25 μg/m$^3$ |
| Lead | 30 Day Average | --- | 1.5 μg/m$^3$ |
| | Calendar Quarter | 1.5 μg/m$^3$ | --- |
| Hydrogen Sulfide ($H_2S$) | 1 Hour | --- | 0.03 ppm (42μg/m$^3$) |
| Vinyl Chloride (chloroethene) | 24 Hour | --- | 0.010 ppm (26 μg/m$^3$) |
| Visibility Reducing Particulates | 1 Observation | --- | In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent. |

The OMGP is located in the southern portion of San Diego County near the border with Mexico and Tijuana. San Diego County is under the jurisdiction of the San Diego County Air Pollution Control District. The District collects ambient air quality data at monitoring sites throughout the air basin. The data is used to determine attainment status and define air quality trends. This area is designated attainment for the state's CO, NO2, SO2, SO4 and lead standards, and attainment for the federal SO2 standard, and unclassified/attainment for the federal PM10 and CO standards (ARB 2000).

## *AMBIENT OZONE*

Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between directly emitted air

pollutants. Nitrogen oxides (NOx) and hydrocarbons (Volatile Organic Compounds [VOCs]) interact in the presence of sunlight to form ozone. The reaction can take several hours to occur, so ozone generally forms downwind and/or lags the timing of the emissions peaks, as shown by the data in Air Quality Table 2 for air monitoring stations at Alpine and El Cajon.

The San Diego area is non-attainment for the federal and state 1-hour ozone standards. As shown by the data in Air Quality Table 2, there are infrequent measurements above the federal standard of 0.12 ppm, but there are consistent measurements above the state standard of 0.09 ppm. The Chula Vista and San Diego air monitoring stations are to the west north west of the OMGP, 12 and 15 miles respectively. The Otay Mesa air monitoring station is approximately 1 mile to the south. The El Cajon air monitoring station is 15 miles north of the plant site. These monitoring stations should provide representative ambient air quality data (i.e., at or downwind of the plant site) for the plant site during the prevailing westerly winds and during the winter easterly wind shifts.

**Air Quality Table 2**
**San Diego Air Basin State 1-hour Ozone Ambient Air Quality Data (ppm)**

| Monitoring Station | 1-hour Measurements | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|
| Chula Vista | Max. concentration (ppm) | 0.14 | 0.098 | 0.117 | 0.099 | 0.105 |
| | # days exceed standard | 7 | 1 | 10 | 2 | 4 |
| Otay Mesa – Paseo International | Max. concentration (ppm) | 0.162 | 0.111 | 0.122 | 0.094 | 0.101 |
| | # days exceed standard | 17 | 6 | 7 | 0 | 1 |
| San Diego – 12th Avenue | Max. concentration (ppm) | 0.130 | 0.105 | 0.117 | 0.098 | 0.091 |
| | # days exceed standard | 3 | 1 | 5 | 1 | 0 |
| Alpine – Victoria | Max. concentration (ppm) | 0.146 | 0.138 | 0.136 | 0.164 | 0.124 |
| | # days exceed standard | 77 | 45 | 29 | 47 | 21 |
| El Cajon – Redwood Ave | Max. concentration (ppm) | 0.135 | 0.111 | 0.111 | 0.127 | 0.103 |
| | # days exceed standard | 17 | 8 | 7 | 14 | 3 |
| California Ozone Ambient Air Quality Standard: 0.09 ppm (1-hour average) | | | | | | |

Source: CARB 2000

In the most recent CARB report on the contribution of various districts to ozone violations in other districts (CARB 1998), CARB found that the South Coast Air Basin and Mexico contribute measurably to ambient ozone levels in the San Diego Air Basin, a downwind district. The contribution of South Coast is overwhelming on some days, significant on some other days, and inconsequential on others. Therefore, some of the ozone violations in the District are due to transported air pollutants. This widespread contribution from one geographic area to another demonstrates the regional and temporal nature of the ozone problem and ozone formation.

In 1997, the US EPA proposed a new 8-hour ozone standard of 0.08 ppm, in addition to the federal 1-hour standard of 0.12 ppm. Legal challenges have placed the new standard in the federal courts. Pending appeals, the current federal 1-hour ozone standard remains in place and 8-hour ozone data is being collected and reported. Air Quality Table 3 shows some representative 8-hour ozone data for the San Diego Air Basin. The San Diego region is non-attainment of the 1-hour standard, and will probably be non-attainment of the proposed 8-hour standard.

The US EPA remains convinced that there is not a disconnect between controls for the 1-hour standard and the more stringent 8-hour standard. Whatever progress is made now toward attaining, or maintaining, the 1-hour federal standard will only speed attainment of the more protective 8-hour standard since planning for the 8-hour standard does not have to be completed until 2003 and attainment not reached until 2005 at the earliest.

**Air Quality Table 3**
**San Diego Air Basin State 8-hour Ozone Ambient Air Quality Data (ppm)**

| Monitoring Station | 1-hour Measurements | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|
| Chula Vista | Max. concentration (ppm) | 0.098 | 0.080 | 0.099 | 0.079 | 0.080 |
| | # days exceed standard | 1 | 0 | 3 | 0 | 0 |
| Otay Mesa – Paseo International | Max. concentration (ppm) | 0.084 | 0.089 | 0.082 | 0.078 | 0.077 |
| | # days exceed standard | 0 | 1 | 0 | 0 | 0 |
| San Diego – 12th Avenue | Max. concentration (ppm) | 0.075 | 0.084 | 0.084 | 0.073 | 0.068 |
| | # days exceed standard | 0 | 0 | 0 | 0 | 0 |
| El Cajon – Redwood Ave | Max. concentration (ppm) | 0.089 | 0.092 | 0.089 | 0.102 | 0.085 |
| | # days exceed standard | 3 | 5 | 1 | 5 | 1 |
| Alpine-Victoria | Max. concentration (ppm) | 0.122 | 0.117 | 0.112 | 0.141 | 0.100 |
| | # days exceed standard | 44 | 27 | 11 | 32 | 15 |
| Proposed Federal Ozone Ambient Air Quality Standard: 0.08 ppm (8-hour average) | | | | | | |

Source: CARB 2000

## *AMBIENT NO2*

While the San Diego region is attainment of the state and federal 1-hour and annual NO2 standards, NO2 is still a concern for the region as a precursor pollutant of ozone and PM10. Air Quality Table 4 shows recent 1-hour NO2 measurements compared to the state 1-hour standard. Annual NO2 measurements have not exceeded 0.025 ppm since 1995, which is well below the federal annual NO2 standard of 0.053 ppm. Ambient NO2 is generally the result of fossil fuel combustion. A large combustion source or high vehicle traffic can create a localized spike of NO2 levels compared to regional NO2 levels, as can be seen by the high NO2 values from the Otay Mesa air monitoring station located at the Paseo International border truck crossing.

Air Quality Table 4 also shows the effect of ozone scavenging of NO2. Ozone scavenging occurs as ambient ozone reacts with NO2 in ambient air and emission plumes, achieving an equilibrium. Both Alpine and El Cajon experience high levels of ozone due to the prevailing winds in the San Diego air basin and transport aloft of air pollutants from adjacent air basins, but generally have lower NO2 measurements compared to the region. This is the same concept as the Ozone Limiting Method (OLM) and Ambient Ratio Method (ARM) used by air dispersion modelers. These methods correct (lower) NO2 impacts from an emissions source like a power plant for the effects of ambient ozone.

**Air Quality Table 4**
**San Diego Air Basin State 1-hour NO2 Ambient Air Quality (ppm [a])**

| Monitoring Station | Standard | 1995 | 1996 | 1997 | 1998 | 1999 | CAAQS[b] |
|---|---|---|---|---|---|---|---|
| Chula Vista | 1-hour max. | 0.098 | 0.079 | 0.109 | 0.104 | 0.100 | 0.25 |
| Otay Mesa – Paseo International | 1-hour max. | 0.114 | 0.117 | 0.107 | 0.132 | 0.172 | 0.25 |
| San Diego – 12th Avenue | 1-hour max. | 0.140 | 0.112 | 0.142 | 0.094 | 0.122 | 0.25 |
| El Cajon – Redwood Ave | 1-hour max. | 0.114 | 0.093 | 0.111 | 0.110 | 0.091 | 0.25 |
| Alpine-Victoria | 1-hour max. | 0.108 | 0.095 | 0.059 | 0.071 | 0.079 | 0.25 |

a. To convert from NO2 ppm to NO2 $\mu g/m^3$, multiply ppm by 1880.
b. There were no measured violations of the NO2 standards at the ambient air monitoring stations in San Diego.

Source: ARB 2000

## *AMBIENT CARBON MONOXIDE*

The San Diego region is attainment of the state and federal CO standards. Air Quality Table 5 shows recent 8-hour CO measurements compared to the state and federal 8-hour standard. Ambient CO is generally the result of fossil fuel combustion. A large combustion source or high vehicle traffic can create localized spikes of CO levels compared to regional CO levels. This can be seen by the high CO values from the Otay Mesa air monitoring station located at the Paseo International border truck crossing and the San Diego air monitoring stations located in vehicle-dense urban settings.

## *AMBIENT PM10*

PM10 can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NOx, SOx and VOC from turbines, and NH3 from NOx control equipment can, given the right meteorological conditions, form particulate matter known as nitrates (NO3), sulfates (SO4), and organics. These pollutants are known as secondary particulates, because they are not directly emitted but are formed through complex chemical reactions in the atmosphere.

**Air Quality Table 5**
**San Diego Air Basin State 8-hour CO Ambient Air Quality (ppm [a])**

| Monitoring Station | Standard | 1995 | 1996 | 1997 | 1998 | 1999 | AAQS[b] |
|---|---|---|---|---|---|---|---|
| Chula Vista | 8-hour max. | 3.84 | 3.43 | 3.76 | 2.73 | 3.04 | 9 |
| Otay Mesa – Paseo International | 8-hour max. | 6.34 | 5.81 | 4.63 | 3.95 | 4.93 | 9 |
| San Diego – 12th Avenue | 8-hour max. | 5.85 | 5.44 | 5.39 | 4.74 | 4.64 | 9 |
| San Diego – Union Street | 8-hour max. | 5.53 | 6.26 | 5.31 | 4.61 | 6.01 | 9 |
| San Diego – Overland Ave | 8-hour max. | 3.53 | 3.25 | 2.96 | 2.76 | 1.60 | 9 |
| El Cajon – Redwood Ave | 8-hour max. | 3.37 | 4.00 | 4.27 | 4.10 | 3.76 | 9 |

a. To convert from CO ppm to CO $\mu g/m^3$, multiply ppm by 1150.
b. There were no measured violations of the CO standards at the ambient air monitoring stations in San Diego. The state and federal 8-hour CO AAQS is 9 ppm.

Source: ARB 2000

PM10 ambient air quality data presented in Air Quality Table 6 shows that there have been violations of the state 24-hr standard. The basin has not recently experienced any violations of the state and federal annual and the federal 24-hour PM10 ambient air quality standards. Therefore, the area is non-attainment of the state PM10 24-hour standard, and attainment of the state and federal annual, and the federal 24-hour PM10 standards.

Both the Otay Mesa and El Cajon ambient air monitoring stations report higher numbers of violations of the state 24-hour PM10 standards than the Chula Vista and San Diego ambient air monitoring stations. These stations are “downwind,” or inland, from the majority of the emissions for the San Diego region. As the mixture of ambient air and air pollutants move away from the coast, under prevailing winds, secondary PM10 air pollutants are formed and additional directly emitted PM10 can be added to the mixture, thereby increasing ambient PM10 levels. This is also illustrated by the relatively clean coastal air quality as measured at Oceanside and the change in air quality as measured at Escondido to the east.

However, the magnitude and the frequency of the Otay Mesa PM10 measurements, suggests that the Otay Mesa area has an ambient, or local, PM10 problem. Discussions with the District suggest that the proximity of the Paseo International border crossing to the ambient air monitor is causing elevated readings. CO, PM10 and NO2 measurements at the Otay Mesa air monitoring station tend to support the contention that the border crossing has an effect on local air quality, as measured by the monitor located in the parking lot of the border crossing. However, staff believes that the station is representative of air quality, including PM10, in the Otay Mesa area because it does reflect the air pollutant emissions from the truck traffic and spillover from Tijuana.

**Air Quality Table 6**
**San Diego Air Basin State 24-hour PM10 Ambient Air Quality (µg/m3)**

| Monitoring Station | Standard | 1995 | 1996 | 1997 | 1998 | 1999 | CAAQS |
|---|---|---|---|---|---|---|---|
| Chula Vista | 24-hour max. | 103 | 62 | 58 | 39 | 59 | 50 |
| | # of days above [a] | 5 | 2 | 2 | 0 | 2 | --- |
| Otay Mesa – Paseo International | 24-hour max. | 121 | 93 | 125 | 89 | 121 | 50 |
| | # of days above [a] | 20 | 15 | 21 | 18 | 21 | --- |
| San Diego – 12th Avenue | 24-hour max. | 115 | 92 | 74 | 48 | 69 | 50 |
| | # of days above [a] | 9 | 1 | 3 | 0 | 4 | --- |
| El Cajon – Redwood Ave | 24-hour max. | 82 | 67 | 76 | 54 | 60 | 50 |
| | # of days above [a] | 6 | 2 | 1 | 1 | 4 | --- |
| Escondido – East Valley Parkway | 24-hour max. | 70 | 53 | 63 | 51 | 52 | 50 |
| | # of days above [a] | 5 | 2 | 3 | 1 | 1 | --- |
| Oceanside – Mission Ave | 24-hour max. | 80 | 63 | 50 | 36 | --- | 50 |
| | # of days above [a] | 4 | 1 | 0 | 0 | -- | --- |

a. PM10 measurements only occur every 6 days, so the actual number of days that violate the standard can be 6 times greater than the number shown here.

Source: ARB 2000

San Diego and Tijuana are expected to continue to grow, creating additional sources of PM10 and precursor emissions. Traffic volume is expected to increase and in the 10 to 15 year time frame an additional border crossing will be built to the east of the existing Paseo crossing. The Otay Mesa air monitoring station is representative of the project site, which is located downwind of two major urban areas and near a large air pollutant emission source such as a diesel truck corridor.

## *AMBIENT SO2*

The San Diego region is attainment of the state and federal SO2 standards. Air Quality Table 7 shows recent 24-hour SO2 measurements compared to the state 24-hour standard. Ambient SO2 is generally the result of combustion of fossil fuel, and, in particular, fuel oil. San Diego is a large port for the US Navy, which continues to use fuel oil in its ships. Additionally, the existing South Bay and Encina power plants can use fuel oil during natural gas curtailments. Therefore, staff does not expect SO2 levels to change significantly. Since SO2 is a precursor to PM10, its relative contribution to PM10 will continue.

Recent concerns about electricity and natural gas supplies in the San Diego area have raised the likelihood of either the Encina or South Bay power plants switching to fuel oil for limited intervals. The switch would be temporary to ease immediate shortages of either electricity or natural gas in the region. The increased sulfur

emissions would not cause the region to exceed the SO2 standards, but would contribute to PM10 levels in the region.

**Air Quality Table 7**
**San Diego Air Basin State 24-hour SO2 Ambient Air Quality (ppm [a])**

| Monitoring Station [c] | Standard | 1995 | 1996 | 1997 | 1998 | 1999 | CAAQS [c] |
|---|---|---|---|---|---|---|---|
| Chula Vista | 24-hour max. | 0.021 | 0.024 | 0.021 | 0.020 | 0.017 | 0.04 |
| Otay Mesa – Paseo International | 24-hour max. | 0.016 | 0.020 | 0.013 | 0.013 | 0.014 | 0.04 |
| San Diego – 12th Avenue | 24-hour max. | 0.018 | 0.012 | 0.014 | 0.011 | 0.008 | 0.04 |

a. To convert from SO2 ppm to SO2 $\mu g/m^3$, multiply ppm by 2620.
b. Only three stations in San Diego measure ambient SO2 levels.
c. There were no measured violations of the SO2 standards at the ambient air monitoring stations in San Diego.

Source: ARB 2000

## PROJECT DESCRIPTION AND EMISSIONS

The Otay Mesa Generating Company (OMGC) proposed Otay Mesa Generating Project (OMGP) consists of two combined cycle combustion turbine generator sets generating 510 MW total. The combustion turbines exhaust to two un-fired heat recovery steam generators, which generate steam for two steam turbines. The steam turbines exhaust to an air-cooled condenser. The applicant is still considering up to three (3) different combustion turbine manufacturers. If ABB or Siemens/Westinghouse combustion turbines are used at the facility, the applicant is proposing to inject steam into the combustor cans for power augmentation for up to 1800 hours per year. Both combustion turbines will have inlet air evaporative coolers installed. The project configuration includes a diesel fire pump and two diesel emergency engines.

From an air pollutant emissions perspective, the OMGP will be one of the cleanest fossil-fueled power plants in the world. The project's use of the SCONOx catalyst system will control NOx emissions to 2 ppm, while also controlling CO and VOC emissions to 6 ppm and 2 ppm, respectively. OMGC will demonstrate the feasibility of SCONOx operation at levels as low as 1 ppm NOx. The project's use of a direct air-cooled condenser avoids PM10 emissions common to wet cooling towers.

## CONSTRUCTION

The construction of the new combustion turbine combined cycle power plant will include the following ancillary facilities and activities, either in series or parallel with the construction activities associated with the combustion turbines:

- Preparation of construction laydown and parking areas,
- Construction of a natural gas, water, and sewer pipelines,
- Construction of a short access road, and
- Construction of transmission lines.

## *PROJECT SITE*

The combustion turbine combined cycle power plants will take approximately two years to construct. The power plant project construction itself consists of three major areas of activity: 1) the civil/structural construction 2) the mechanical construction, and 3) the electrical construction. The largest air emissions are generated during the civil/structural activity, where work such as grading, site preparation, foundations, underground utility installation and building erection will occur. These types of activities require the use of large earth moving equipment, which generate considerable combustion emissions themselves, along with creating fugitive dust emissions. The mechanical construction includes the installation of the heavy equipment, such as the combustion and steam turbines, the heat recovery steam generators, condenser, pumps, piping and valves.

Although not a large fugitive dust generation activity, the use of large cranes to install such equipment generates significantly more emissions than other construction equipment onsite. Finally, the electrical equipment installation occurs, involving such items as transformers, switching gear, instrumentation and wiring, and are relatively small emissions generating activities in comparison to the early construction activities. Not surprisingly, the largest level of construction emissions for the project will occur from the project site activity, most of it due to earth moving and grading activities and large crane operations. The construction of facilities will generate air emissions, primarily fugitive dust from earth moving activities and combustion emissions generated from the construction equipment and vehicles.

The projected highest hourly emissions over the 25-month construction activity are shown in Air Quality Table 8. The construction of the pipelines includes activities such as clearing and grading, trenching, stringing the pipes and fittings, lining and connecting, and backfill and clean-up. The exhaust emissions generated by equipment during these activities are included in the emissions in Air Quality Table 10. SO2 and VOC are not included in the estimates since VOCs do not have an ambient air quality standard and SO2 emissions are not likely to cause a violation of the SO2 standards.

Note that AFC Section 3.8 describes a 4 X 10 work schedule (OMGC 1999a), while the air quality analysis in AFC Section 5.2.3.1.1 was done assuming a 8-hour construction day. The difference in length of the construction day does not have an effect on the hourly emissions or the grams per second used in the modeling.

**Air Quality Table 8**
**Maximum Daily Construction Emissions**

| | NOx | VOC | CO | PM10 | SO2 |
|---|---|---|---|---|---|
| Project Construction (lbs/hour) [a b] | 27.8 | --- | 135.1 | 3.1 | --- |

a. All emissions based on an 8-hour workday
b. Maximum hourly emissions are worst case of site construction and pipeline/linear activities.

Source: OMGC 1999a

# OPERATIONAL PHASE

## *EQUIPMENT DESCRIPTION*

The major components of the OMGP consists of the following:

- Two combustion turbine generators (CTG) equipped with evaporative inlet air coolers;
- Two unfired heat recovery steam generators (HRSG) and ancillary equipment;
- A diesel fire pump;
- Two diesel emergency engines;
- Two steam turbines with air cooled condensers; and
- Auxiliary cooling water heat exchangers to reject heat from equipment

## *EQUIPMENT OPERATION*

The new CTGs will burn only natural gas, and there are no provisions for an alternative back-up fuel.

The applicant analyzed the project with one turbine in start-up and one turbine at low load, both operating concurrently with the testing of the diesel fire pump for the maximum 1-hr NO2 and CO impacts. Other operating configurations and ambient temperatures were analyzed to determine the maximum 3-hour, 8-hour, 24-hour and annual scenarios. The worst case emissions profiles for modeling purposes included emissions from the testing and operation of the diesel emergency engines.

There are various durations of start-up of the CTGs, depending on length of time that the turbine has been shutdown and the temperatures and pressures on the steam turbine side of the power generation block. Because of the thermal efficiency of the project, it is highly likely that the combustion turbines will operate extensively, therefore extended shutdowns are not likely to occur. The applicant based their emissions estimates on 10 cold and 40 warm start-up per turbines (OMGC 1999a). The expected capacity factors of the combustion turbine units will be close to 100 percent.

The usual practice is to define start-ups as either a hot start, a warm start or a cold start, with the start-up period being defined as the length of time until the gas turbine is fully loaded, that is, producing baseload electrical power. A hot start would occur after an overnight turbine shutdown. The duration of a hot start is relatively short, approximately half an hour. A warm start-up is also approximately 30 to 60 minutes in duration, although the steam turbine ramping up period would be longer than a hot start. A warm start-up would occur after a typical weekend shutdown (approximately 60 to 72 hours). A cold start takes considerably longer, on the order of two hours. However, this type of start-up would be very rare, occurring only after the turbines have been under extended shutdown, such as the annual maintenance inspection that the manufacturer may require (OMGC 1999a and Kehlhofer 1999).

### *EMISSION CONTROLS*

The exclusive use of an inherently clean fuel, natural gas, will limit the formation of SO2 and PM10 emissions. Natural gas contains very small amounts of a sulfur compound known as mercaptan, which when combusted, results in sulfur compound emissions in the flue gas. However, in comparison to other fuels used in power plants, such as fuel oil or coal, the sulfur dioxide emissions from the combustion of natural gas are very low. A sulfur content of 0.25 grains of sulfur per 100 standard cubic feet of natural gas was assumed for the SO2 emission calculations. Although the sulfur content of natural gas in the San Diego area is usually about 0.20 grains, the regulatory limit is 0.75 grains. SO2 emissions may be adjusted to reflect the higher potential

Like SO2, the emissions of PM10 from natural gas combustion are very low compared to the combustion of fuel oil or coal. Natural gas contains very little noncombustible gas or solid residue, and therefore it is a relatively clean-burning fuel.

To minimize NOx, CO and VOC emissions during the combustion process, the turbine is equipped with the latest dry low-NOx combustors. A more detailed discussion of this combustion technology is presented in the Mitigation section of this analysis. After combustion, the flue gases pass through the heat recovery steam generator (HRSG), where catalyst systems are placed to further reduce NOx, CO and VOC emissions. OMGP is proposing to use a SCONOx adsorption/oxidation system to reduce NOx, CO and VOC emissions. A more complete discussion of these catalyst technologies is included in the Mitigation section.

## PROJECT OPERATING EMISSIONS

A single CTG's criteria air pollutant 1-hour emissions are shown in Air Quality Table 9. The highest emissions are from the combustion turbine during startup compared to emissions during steady state, full load operation. Most notable, emissions of NOx, VOC and CO are significantly higher during startup. These higher emissions occur because the turbine combustor technology is designed for maximum efficiency during full load steady state operation, not start-up.

Emission rates also increase during power augmentation. Steam or water is injected into the combustor cans. The steam or water reduce the temperature in the combustor cans and increase the mass of hot gases expanding through the power turbine. Because of the quenching action, additional fuel can be fired, increasing the mass flow of air pollutants. The OMGP will power augment up to 1800 hours per year.

During startup and shutdown, combustion temperatures and pressures are rapidly changing, which results in less efficient combustion and higher emissions. Also, the flue gas controls, such as the catalyst discussed above, operate most efficiently when the turbine operates near or at full load, at which the catalysts are at or near design temperatures. Those flue gas controls are not as effective during the transitory temperature changes that occur during startup and shutdown.

**Air Quality Table 9**
**CTG Hourly (unless noted) Emissions (pounds per hour [lbs/hr])**

| Operational Profile | NOx | SO2 | PM10 | VOC | CO |
|---|---|---|---|---|---|
| CTG Start-up cold start | 44 | --- | --- | 49 | 887 |
| CTG Start-up warm start | 44 | --- | --- | 39 | 600 |
| CTG Start-up hot start | 21 | --- | --- | 15 | 150 |
| CTG Steady State @ 100% load | 12.8 | 3.5 | 18 | 2.8 | 23.4 |
| CTG Steady State w/power augmentation | 14.0 | 4.5 | 19.1 | 3.3 | 24.4 |

Source: District 2000a

The worst case hourly and daily emissions from the project (both turbines) are shown in Air Quality Table 10. The table includes start-ups and different operating scenarios, and the resultant emissions. The hourly and daily emissions do not include potential emissions from the testing of the diesel fire pump and emergency generators.

Annual emissions are also summarized in the Air Quality Table 10. OMGP has requested that the project be limited to 100 tons per year of NOx. Initial commissioning air emissions, which not surprisingly, can be significant in comparison to the likely commercial operation annual emissions, are to be included in the annual emissions caps. Actual commissioning emissions will be reported as part of the commissioning activities at the OMGP. The annual emissions do not yet include potential emissions from the limited annual testing of the diesel fire pump and emergency generators.

**Air Quality Table 10**
**Worst Case Project Emissions (hourly, daily and annual)**

| Operational Profile | NOx | SO2 | PM10 | VOC | CO |
|---|---|---|---|---|---|
| Hourly : 1 turbine start-up and 1 turbine steady state operation (lbs/hour) | 58 | 9 | 38.2 | 52.3 | 911.4 |
| Daily: 1 turbine start-up and 1 turbine steady state operation (lbs/day) | 716 | 216 | 916.8 | 223.8 | 2,307.4 |
| Annual: Start-up and steady state operation (tons per year) | 100 | 39.4 | 159.6 | 27.2 | 235.2 |

Source: District 2000a

## *INITIAL COMMISSIONING PHASE OPERATION AND EMISSIONS*

A temporary HRSG boilout chemical cleaning boiler will be used prior to the first firing of the combustion turbines. The combustion turbines will then undergo the initial firing and commissioning phase of the project schedule. Over the 120 day commissioning phase for each turbine, each OMGP combustion turbine will be limited to no more than 30 days of operation without the SCONOx system installed . Additionally, NOx will monitored with a Continuous Emission Monitoring (CEM)

system (either the permanent or a temporary CEM system) and included in the annual emissions.

It should be noted that it is in the owner's best interest to minimize this initial commissioning phase in order for the project to be declared ready for commercial operation and thus able to generate revenues. Therefore, it is expected that this initial commissioning phase will, to the extent feasible, be as short as possible and thus minimize the higher than normal operations emissions that are inevitable during the necessary testing.

OMGC faces several issues during the commissioning of the OMGP. First and foremost, the OMPP is using a new NOx control system unproven at this scale. This project also uses an air-cooled condenser, which to date, is a relatively new component of power plants and has caused some commissioning delays at other power plants (Tater 2000). Commissioning of a modern combined cycle power plant is already a significant undertaking, as the commercial operation of the plant requires the complex integration of multiple systems. The inclusion of two new systems will complicate the process.

The District and OMGC have discussed the commissioning of the OMGP. The proposed PDOC conditions of certification outline a schedule and emission limits for the project during commissioning. After no more 120 day of commissioning activities, the project will enter a 180 day optimization period during which the applicant will undertake all reasonable efforts to achieve a NOx emission level of 1.0 ppm, at 15 O2 over a 3-hour rolling average.

## FACILITY CLOSURE

Eventually the OMGP will close, either as a result of the end of its useful life (which is expected to be 30 years), or through some unexpected situation such as a natural disaster or catastrophic facility breakdown. When the facility closes, then all sources of air emissions would cease and thus all impacts associated with those emissions would no longer occur. If OMGC were to decide to dismantle the project, there would likely be fugitive dust emissions associated with this dismantling effort. The Facility Closure Plan to be submitted to the Energy Commission Compliance Project Manager should include the specific details regarding how OMGC plans to demonstrate compliance with District rules and fugitive dust and construction emission control measures.

## PROJECT INCREMENTAL IMPACTS

## MODELING APPROACH

The applicant performed an air dispersion modeling analysis to evaluate the project's potential impacts on the existing ambient air pollutant levels, both during construction and operation. An air dispersion modeling analysis usually starts with a conservative screening level analysis. Screening models use very conservative assumptions, such as the meteorological conditions, which may or may not actually

occur in the area. The impacts calculated by screening models, therefore, can be double or more than the actual or expected impacts. If the screening level impacts are significant, refined modeling analysis is performed. A major difference in the refined modeling is that hour-by-hour meteorological data collected in the vicinity of the project site is used. Two models were used. The Industrial Source Complex Short-Term model, Version 3, known as the ISCST3 model was used for the screening and refined modeling. AERMOD was used for refined PM10 and NO2 modeling.

## CONSTRUCTION IMPACTS

OMGC performed air dispersion modeling analyses of the potential construction impacts at the project site. The analyses included fugitive dust generated from the project site construction activity (modeled as an area source) and combustion emissions from the equipment (modeled as an area source). The emissions used in the analysis were the highest emissions of a particular pollutant during a one-month period, converted to a gram per second emission rate for the model. The results of this modeling effort are shown in Air Quality Table 11. They show that the construction activities would worsen existing violations of the state and federal 24-hour PM10 standard, the 1-hour NO2 standard, and the 8-hour CO standard.

**Air Quality Table 11**
**Maximum Project Site Construction Impacts**

| Pollutant | Averaging Time | Impact ($\mu g/m^3$) | Background ($\mu g/m^3$) [b] | Total Impact ($\mu g/m^3$) | Limiting Stnd ($\mu g/m^3$) | Percent of Standard |
|---|---|---|---|---|---|---|
| NO2 [a] | 1-hour | 611.5 | 323.4 | 935 | 470 | 199 |
| CO | 8-hour | 6221.7 | 7,291 | 13,512 | 10,000 | 135 |
| PM10 | 24-hour | 110.0 | 121 | 231 | 50 | 462 |

a. Ozone limiting method applied to the one-hour impacts.
b. From the Otay Mesa Monitoring station.

Source: OMGC 1999a

These predicted impacts are of such a high magnitude for a number of reasons. First, the model itself calculates impacts that are very conservative, usually exceeding actual impact levels by a considerable margin. Second, some of the sources of combustion emissions (the bulldozers and trucks) are mobile sources, not stationary sources as input into the model. Therefore, as mobile sources, the air quality impacts would not always be at the same locations, so the model results are overstated. Fourth, it was assumed that all the equipment identified for the modeling evaluation would be running simultaneously. It is doubtful that all the major equipment would all be operating at one time, and thus the impacts are overstated.

Finally, the emissions inputs to the model were from the highest monthly emissions assumed during the 25-month construction period. The levels of emissions used reflect a period of activity of approximately one year, not the entire construction period. During the other months of construction work, considerably fewer emissions-generating equipment will be used and thus the impacts will be lower.

Although construction of the OMGP and ancillary facilities will result in unavoidable short-term impacts, it is doubtful that the general public would be exposed to the construction impacts associated with the project. This is because of the project's rather isolated location away from any population centers in a heavily industrial area where the impacts would actually occur. Nevertheless, staff believes that the impact from the construction of the project could have a significant and unavoidable impact on the CO, PM10 and NO2 ambient air quality standards, and should be avoided or mitigated, to the extent feasible.

## PROJECT OPERATION IMPACTS

The air quality impacts of project operation are shown in the following sections for combustion turbine steady-state operations, and the transitory conditions during turbine start-up and the special meteorological conditions associated with fumigation. The modeling analysis not only includes the combustion turbines, but also includes the diesel fire pump and the two emergency lube oil pumps.

OMGC provided a refined modeling analysis, using the ISCST3 and AERMOD models to quantify the potential impacts of the project during normal steady state operation and conditions. The analysis assumes worst case ambient temperatures during steady state operation to predict the highest impacts possible.

OMGC also provided a refined modeling analysis, using the ISCST3 model to quantify the potential impacts of the project during start-up conditions. The start-up emissions for NOx and CO are generally higher since the combustion turbine and downstream components, including the SCONOx, are not at design (elevated) temperatures. This results in less complete combustion (i.e., increased CO emissions) and relatively uncontrolled NOx emissions. The modeling assumes these higher emission rates with stack parameters for turbine operation at 60 percent load. The low load conditions can cause higher impacts since the flue gas temperature and velocity are relatively low, resulting in less plume rise away from the facility.

The results of these two modeling analyses are included in Air Quality Table 12. The maximum impacts for NO2 and CO are due to start-up emissions, which are relatively high during start-up. The maximum PM10 impacts are from steady state operation.

### *FUMIGATION MODELING*

During the early morning hours before sunrise, the air is usually very stable. During such stable meteorological conditions, emissions from elevated stacks rise through this stable layer and are dispersed. When the sun first rises, the air at ground level is heated, resulting in a vertical (both rising and sinking air) mixing of air for a few hundred feet or so. Emissions from a stack that enter this vertically mixed layer of air will also be vertically mixed, bringing some of those emissions down to ground level. Later in the day, as the sun continues to heat the ground, this vertical mixing layer becomes higher and higher, and the emissions plume becomes better dispersed. The early morning air pollution event, called fumigation, usually lasts

approximately 30 to 90 minutes. Because of the short duration of fumigation events, only 1-hour impacts are calculated. The modeling results for are shown in Air Quality 12.

**Air Quality Table 12**
**Summary of Refined Modeling Maximum Impacts**

| Pollutant | Averaging Time | Maximum Modeled Concentrations (µg/m3) | |
|---|---|---|---|
| | | Normal operation and start-ups | Fumigation |
| NO2 | 1-hour | 130 [a] | 6.9 |
| | Annual | 0.8 [b] | --- |
| CO | 1-hour | 2,342 | 127.1 |
| | 8-hour | 643 | --- |
| PM10 | 24-hour | 4.6 [c] | --- |
| | Annual | 0.8 | --- |

a. Using the ozone limiting method.
b. Using ARM default value of 0.75.
c. AERMOD refined modeling result.

Source: OMGC 2000a and OMGC 2000b

## *PROJECT IMPACTS*

OMGC provided a refined modeling analysis, using the ISCST3 model to quantify the potential impacts of the project during normal steady state operation and during start-up and fumigation conditions. The results of these modeling analyses were summarized in Air Quality Table 13. Using the highest impacts from Air Quality Table 13 and the highest measured ambient air quality levels (Air Quality Tables 2, 4, 5 and 6), the predicted the worst case impacts for the various operating scenarios for the project are calculated and shown in Air Quality Table 13.

The project's PM10 impacts could contribute to existing violations of the state 24-hour and annual PM10 standards. The highest 24-hour PM10 impacts (4.6 $\mu g/m^3$) are relatively large, about 1/10 the state standard itself. These impacts from OMGP directly emitted PM10 emissions could be significant if left unmitigated.

Start-up circumstances can be troublesome for significant air quality impacts for the following reasons. First, emissions (particularly of NOx and CO) can be high and often uncontrolled because emission control equipment is not operating at optimum temperature ranges. Second, low volumetric flow rates and exhaust gas temperatures can result in low exhaust plume rise and consequently higher ground level impacts, as found in the total 1-hour impacts for NO2 and CO in Air Quality Table 13. For this reason, the two combustion turbines will not be started simultaneously, but sequentially. This modeling analysis reflected the use of the Ozone Limiting Method (OLM) and Ambient Ratio Method (ARM) to provide a more refined estimate of NO2 impacts.

**Air Quality Table 13**
**Combustion Turbine Refined Modeling Maximum Impacts**

| Pollutant | Averaging Time | Impact (µg/m$^3$) [a] | Back-Ground (µg/m$^3$) [d] | Total Impact (µg/m$^3$) | Limiting Standard (µg/m$^3$) | Percent of Standard |
|---|---|---|---|---|---|---|
| NO2 | 1-hour | 130 [b] | 323.3 | 453 | 470 | 96 |
| | Annual | 0.8 [e] | 43.2 | 44 | 100 | 44 |
| CO | 8-hour | 643.2 | 7,823 | 8,466 | 10,000 | 85 |
| PM10 | 24-hour | 4.6 | 121 | 125.6 | 50 | 251 |
| | Annual [c] | 0.8 | 32.4 | 33.2 | 30 | 111 |

a. The worst case impacts from Air Quality Table 12.
b. Using the ozone limiting method.
c. Annual Arithmetic mean.
d. Background PM10, NO2, and CO data was collected between 1994 and 1999 at the Otay Mesa ambient air monitoring station.
e. Using the ARM default value of 0.75.

Source: OMGC 2000a and OMGC 1999a

## *SECONDARY POLLUTANT IMPACTS*

The project's emissions of gaseous emissions, primarily NOx, SO2 and VOC, can contribute to the formation of secondary pollutants, namely ozone and PM10, particularly ammonium nitrate PM10 and sulfate. There are air dispersion models that can be used to quantify ozone impacts, but they are used for regional planning efforts where hundreds or even thousands of sources are input into the modeling to determine ozone impacts. There are no regulatory agency models approved for assessing single source ozone impacts. However, because of the known relationship of NOx and VOC emissions to ozone formation, it can be said that the emissions of NOx and VOC from the OMGP do have the potential (if left unmitigated) to contribute in some unquantified way to higher ozone levels in the region.

Concerning secondary PM10 (primarily ammonium nitrate) formation, the process of gas-to-particulate conversion is complex and depends on many factors, including local humidity and the presence of other compounds. Currently, there is not an agency (EPA or CARB) recommended model or procedure for estimating nitrate or sulfate formation.

Staff believes that the emissions of NOx, SOx and VOC from OMGP do have the potential (if left unmitigated) to contribute, to higher secondary PM10 (particularly of ammonium nitrate) levels in the region.

## *COMMISSIONING MODELING*

OMGC provided a refined modeling analysis using the AERMOD model to quantify the maximum emissions during the commissioning periods. The analysis used the 1-hour NO2 standard (470 µg/m$^3$) and the 1-hour CO standard (23,000 µg/m$^3$) to back-calculate the worst case emissions rates allowable during the commissioning

periods. Air pollutant emissions can be higher during these periods as the post-combustion catalysts are initially not installed while the combustion turbine is first optimized.

The results of this modeling analysis are summarized in Air Quality Table 14. However, because staff believes ambient air quality at the project site is better represented by the Otay Mesa monitoring station, the maximum allowable NO2 and CO emissions during commissioning have to be recalculated for the Final Staff Assessment.

**Air Quality Table 14**
**Commissioning/Optimization Period Maximum NO2 and CO Emissions**

| **Pollutant** | | **Commissioning/ Maximum Allowable Emissions** | | | |
|---|---|---|---|---|---|
| | | **Without SCONOx installed** | | **With SCONOx installed** | |
| | | Two Turbines | **One Turbine** | Two Turbines | **One Turbine** |
| NO2 | **Lbs/hour** | 1,649 | 1,133 | 412 | 283 |
| CO | **Lbs/hour** | 2000 | N/A | N/A | N/A |
| | | | | | |

Source: OMGC 2000a, OMGC 2000b, and District 2000a

## CUMULATIVE IMPACTS

To evaluate reasonably foreseeable future impacts as part of the project impacts analysis, the applicant performed a cumulative modeling analysis. The cumulative analysis included potential and/or permitted projects located up to nine miles from the proposed facility site, which is greater than the six mile radius generally specified by staff. The applicant worked with the District to identify potential and/or permitted projects. None were identified, so cumulative modeling was not done.

## PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

The PSD modeled impacts of the OMGC project were below allowable District and federal increments, as shown in Air Table 15. The impacts were significantly below allowable increments.

**Air Quality Table 15**
**PSD Increments and Modeled Project Impacts**

| **Pollutant** | **Averaging Time** | **Class II Impact ($\mu g/m^3$)** | **Agua Tibia Maximum Modeled Impact ($\mu g/m^3$)** | **Class I Increment ($\mu g/m^3$)** | **Class II Increment ($\mu g/m^3$)** |
|---|---|---|---|---|---|
| NO2 | 24-hour | N/A | 0.04 | N/A | N/A |
| NO2 | Annual | 0.8 | 0.0006 | 2.5 | 25 |
| PM10 | 24-hour | 4.6 | 0.064 | 8 | 30 |
| PM10 | Annual | 0.8 | 0.0021 | 4 | 17 |

Source: District 2000a

## VISIBILITY IMPACTS

A visibility analysis of the project's gaseous emissions is required under the Federal Prevention of Significant Deterioration (PSD) permitting program. The analysis addresses the contributions of gaseous emissions (primarily NOx) and particulate (PM10) emissions to visibility impairment on the nearest Class 1 PSD areas, which are national parks and national wildlife refuges. The nearest Class 1 area to the OMGP is the Agua Tibia National Wilderness Area. OMGC used the EPA approved model VISCREEN to assess the project's visibility impacts. The results from the VISCREEN modeling analysis indicated that the project's visibility impacts would be below the significance criteria for contrast and perception (OMGC 1999a and District 2000a). Therefore the project's visibility impacts on Class 1 areas are considered insignificant.

## MEXICO IMPACTS

The applicant analyzed whether there would be any significant air quality impacts in Mexico. The modeling found the maximum impacts from the project would occur on the terrain to the east of the project. Project impacts in Mexico were generally one-half to one-tenth of the maximums on the San Diego County side of the border, and are not considered significant.

## MITIGATION

## APPLICANT'S PROPOSED MITIGATION

### *CONSTRUCTION MITIGATION*

OMGC is proposing a number of control measures to limit fugitive dust during the construction phase of a project (OMGC 1999a). These include the use of chemical stabilizing agents and dust suppressants or gravel areas on site, and the wetting or covering of stored earth materials on site. These proposed measures also require that the transporting of borrow fill dirt material be wetted, covered, or that sufficient freeboard be allowed. They also require the use of paved access aprons, gravel strips, wheel washing or other means to limit mud or dirt carry-out onto paved public roads.

To minimize combustion emissions such as NOx, CO and PM10, OMGC is proposing to require that contractors properly maintain vehicle/equipment engines to control exhaust emissions.

### *OPERATIONS MITIGATION*

The OMGP air pollutant emissions impacts will be reduced by using emission control equipment on the project and by providing emission offsets. To reduce NOx emissions, OMGC proposes to use dry-low NOx combustors in the CTGs. In addition, each combustion turbine will use a SCONOx oxidation/adsorption catalyst system to achieve a NOx concentration of 2.0 ppm, corrected to 15 percent excess oxygen averaged over a 3-hour period. The District and the applicant will develop a plan to reduce NOx emissions from the OMGP to as low as 1 ppm.

To reduce CO and VOC emissions, OMGC proposes to use good combustion and maintenance practices and the SCONOx system. PM10 emissions will be limited by the use of a clean burning fuel (natural gas) and the efficient combustion process of the CTGs. The use of natural gas as the only fuel will limit SO2 emissions.

#### DRY LO-NOX COMBUSTORS

Over the last 20 years, combustion turbine manufacturers have focused their attention on limiting the NOx formed during combustion. Because of the expense and efficiency losses due to steam or water injection into the combustor cans to reduce combustion temperatures and the formation of NOx, CTG manufacturers are presently choosing to limit NOx formation through the use of dry low-NOx technologies. In this process, firing temperatures remain somewhat low, thus minimizing NOx formation, while thermal efficiencies remain high. At steady state CTG loads greater than 40 percent load, NOx concentrations entering the HRSG are 25 ppm corrected to 15 percent O2. CO concentrations are more variable, with concentrations greater than 100 ppm at 50 percent load, dropping to 5 ppm at 100 percent load.

#### FLUE GAS CONTROLS

To further reduce the emissions from the combustion turbines before they are exhausted into the atmosphere, a catalyst system will be installed in the HRSGs. OMGC is proposing the SCONOx system to reduce NOx, VOC, and CO emissions. SCONOx refers to a proprietary system developed by Goal Line Environmental Technologies and currently being marketed by ABB Alstom, under license, for large combustion turbine projects. It is an oxidation/absorption catalyst system that controls NOx, CO and VOC emissions in combustion flue gases.

OMGC proposes to use the SCONOx system in combination with the dry low-NOx combustors and a NOx concentration of 2.0 ppm. The District and the applicant will develop a plan to demonstrate the ability of SCONOx reduce NOx emissions from the OMGP to as low as 1 ppm.

Several reactions occur in the SCONOx catalyst banks. A proprietary catalyst absorbs sulfur compounds to prevent masking and degradation of oxidation/absorption catalysts, which oxidize NO to NO2, CO to CO2, and VOCs. NO2 is then adsorbed by the catalyst while CO2 and oxidized VOC compounds are emitted out the stack. Prior to saturation with NO2, catalyst regenerated is required. The catalysts are sealed off from the exhaust stream by of a pair of mechanical louver doors and subjected to a hydrogen rich/oxygen lean mixture of natural gas and steam. This regeneration removes the captured NO2 and produces elemental nitrogen, water, and the sulfur compounds, which are emitted through the stack.

The catalysts in each module must be removed and put through a cleaning process to maintain reactivity. It is anticipated that this would occur annually, but the NOx control levels desired and the levels of contaminants in the fuel and ambient air may dictate a different washing frequency. There is some concern that this washing solution may be an additional hazardous waste stream from the project, however, it

can be disposed of properly under Title 22 of the California Code of Regulations. The time required for the washing process is likely to be 1-2 weeks.

The SCONOx system differs from the selective catalytic reduction (SCR) systems generally used to control NOx emissions for large combustion turbine projects. SCR catalysts generally operate between 600 to 750$^{o}$F (ARB 1992), and are normally placed in the middle of the HRSG to achieve this optimum temperature window. SCONOx catalysts are believed to have a wider temperature window, allowing more design flexibility. However, for the OMGP, the SCONOx system will be placed where an SCR system normally would be located to allow the use of SCR on the OMGP if the SCONOx system does not achieve the level of NOx control required by the permit.

Additionally, SCONOx does not require the use of ammonia and an ammonia injection system. Therefore, SCONOx projects will not have ammonia slip, which is the result of un-reacted ammonia in an SCR system. However, the SCONOx system does require a system to produce the hydrogen rich/oxygen lean mixture of natural gas and steam. Depending on the operating temperature of the catalyst, this regeneration system could include a steam reformer to increase the free hydrogen in the regeneration gas mixture.

SCR systems are generally ineffective during turbine start-up or when catalyst temperatures are lower than 600$^{o}$F. The SCONOx system, with it wider temperature window and absorption mechanism, promises to be effective for NOx control during start-ups and process upsets. This is contingent on the system being designed with a sufficient capacity to adsorb NOx emissions spikes until such time that the regeneration cycle can be increased to or keep up with NOx emissions.

If the SCONOx system does not perform as designed, the applicant has agreed to install a selective catalytic reduction system to control NOx. Without the SCONOx system, the project may also have to use an oxidization catalyst to achieve the permitted VOC and CO levels.

### *EMISSION OFFSETS*

District Rule 20.1 requires that OMGC provide emission offsets, in the form of emission reductions or banked Emission Reduction Credits (ERC), for the project's emissions increases of NOx. Other air pollutant emissions (such as VOC, SO2 and PM10) do not trigger offset requirements per District rules. The NOx offsets must be federally enforceable (i.e., meet federal requirements for offsets), provided on a tons per year basis, and from San Diego County. Additionally, if the NOx offsets are provided as an interpollutant trade, the trade must be federally enforceable (i.e., meet federal requirements for offsets). Offsets for NOx increases with VOC are to be provided at a ratio of 2 lbs. VOC to 1 lb. NOx (District 2000b).

The total potential annual NOx air emissions for the OMGP at 2.0 ppm could be as high as 116 tons per year (District 2000a). However, OMGC is requesting a permit limit of 100 tons per year of NOx, which will include commissioning emissions, start-up emissions and shutdown emissions. It is anticipated that OMGC can operate

below the permit level through over-control of NOx emissions with the SCONOx system and/or curtailed operation.

OMGC is required to provide NOx offsets for the project's 100 tons per year NOx liability at the offset ratio of 1.2 to 1. VOC offsets will be provided at the offset ratio of 2.4 to 1 (an interpollutant trading ratio of 2:1 and an offset ratio of 1.2:1). (District 2000a). OMGC has carried out a herculean effort to secure NOx offsets in the San Diego area. The offset market is very limited and prices are high. OMGC has negotiated contracts and option agreements with numerous ERCs holders. They have also identified other emission reduction opportunities and are pursuing banking of these credits. The NOx offsets will be a combination of traditional emission reduction credits (ERC) and relatively untried mobile emission reduction credits (MERC), as shown in Air Quality Table 16.

OMGC has proposed to use emission reduction credits generated from the mobile sector. One set of MERCs will be a replacement of diesel engines in a fleet of harbor excursion boats. The difference in the NOx emissions from the existing diesel engines and the new clean diesel engines, multiplied by use factors , will be the amount of NO2 reductions banked. Since the new engines are not certified by CARB or EPA to a PM10 or VOC performance level, OMGC is not proposing to formally bank or use the reductions of these pollutants. Staff is interested in using the reductions as mitigation for project PM10 and PM10 precursor emissions.

The second set of MERCs may consist of a conversion of a diesel truck fleet to natural gas engines. The difference in the NOx emissions from the existing diesel engines and the new, natural gas engines, multiplied by use factors, will be the amount of NO2 reductions banked. Again, since the natural gas engines are not certified by CARB or EPA to a PM10 or VOC performance level, OMGC is not proposing to formally bank or use the reductions of these pollutants. Staff is interested in securing the reductions as mitigation for project PM10 and PM10 precursor emissions.

Both sets of MERCs are being banked under the District's Rule 27, Banking of Mobile Source Emission Reduction Credits. The applicant, the District, CARB, and the EPA have worked diligently to craft the framework necessary to bank the OMGC MERCs under the rule. The District prepared and issued an EIR on the framework for public comment period, which ended August 1, 2000. Agencies have already provided comments. Pending resolution of any public comments, the District's MERCs framework should provide viable offsets for the OMGP.

OMGC is still negotiating with some ERC and MERC holders. Additionally, since the MERC framework is draft, and issues may arise during the implementation of the fleet conversion, MERC quantities may change. Given these uncertainties, the offset package may still change significantly prior to the Final Determination of Compliance and the Final Staff Assessment. Therefore, the ERC and MERC values, and NOx equivalent tonnage applicable to OMGP identified in Air Quality Table 16 are still tentative.

**Air Quality Table 16**
**OMGP NOx and VOC Offsets (tons per year)**

| Offset source | NOx | VOC | Interpollutant Trading Ratio [a] | Offset Ratio [a] | Tonnage Applicable to OMGP |
|---|---|---|---|---|---|
| **ERCs** | | | | | |
| US Foam | | 30.2 | 2:0 | 1.2 | 12.6 |
| US Foam | 1.3 | | | | 1.1 |
| National Offset | 4.4 | | | | 3.7 |
| Alcoa | 1.21 | | | | 1.0 |
| Napp Systems | | 17.05 | | | 7.1 |
| Solar Turbines | | 25 | | | 10.4 |
| General Dynamics | | 48 | | | 20.0 |
| Confidential Source A [b] | 5 – 20 | | | | ≈4.2 – 16.7 |
| Confidential Source B [b] | ? | ? | | | ? |
| Subtotal | | | | | ≈60 – 72.5 |
| | | | | | |
| **MERCs** | | | | | |
| San Diego Harbor Excursion: diesel to diesel conversion | ≈25 | | 2.0 | 1.2 | ≈20.8 |
| Fleet conversion: diesel engines to natural gas engines [b] | ≈35 | | | | ≈29.2 |
| Subtotal | | | | | ≈50 |
| | | | | | |
| **TOTAL** | | | | | ≈110 - 122.5 |

a. Per District rules.
b. Submitted under confidential cover pending negotiations. Staff is uncertain of negotiation status.

Source: District 2000a

# ADEQUACY OF PROPOSED MITIGATION

## *CONSTRUCTION MITIGATION*

OMGC will be required to comply with the proposed control measures for limiting fugitive dust emissions during construction. In addition, OMGC has proposed that they will require contractors to maintain their vehicles and equipment to limit exhaust emissions. Staff believes that additional measures are necessary to mitigate potential construction impacts (refer to staff proposed mitigation below).

## *OPERATIONS MITIGATION*

### EMISSION CONTROLS

OMGC has proposed to limit NOx emissions from the combustion turbines to 2.0 ppm at 15 percent O2 over a 3-hour rolling average. This complies with the ARB Power Plant Siting Guidelines and other projects being certified by the Energy Commission.

OMGC proposes VOC concentrations of less than 2.0 ppm at 15 percent O2 over a 1-hour rolling average, and CO concentrations of less than 6.0 ppm at 15 percent O2 over a 3-hour rolling average. Again, these emission rates are due to the

SCONOx system, and without the use of an oxidizing catalyst traditionally used in a SCR system. The emission rates for NOx, CO and VOC agree with the recommendations provided in the ARB Guidance Document on Power Plant Siting.

If the SCONOx system does not perform as designed, the applicant has agreed to install a selective catalytic reduction system to control NOx. Without the SCONOx system, the project may have to use an oxidization catalyst to achieve the permitted VOC and CO levels.

#### OFFSETS

OMGC has identified an incomplete offset package that, on an annual basis, does not yet offset the potential NOx air emissions increases (District 2000a). The adequacy of the offset package is pending completion of the environmental review of the MERC framework and completion of final, negotiated ERC and MERC agreements or contracts. The District has not prepared a Condition of Certification requiring the surrender of specific (or any) ERCs and MERCs.

The proposed emission offsets for NOx do not adequately mitigate the project's potential emissions of VOC (as precursor to O3 and secondary PM10), SO2 (as precursor to secondary PM10) and directly emitted PM10. Staff, as discussed in the impacts section, believes that those emissions of VOC, SO2 and PM10 constitute and significant, unmitigated impact.

## STAFF PROPOSED MITIGATION

### *CONSTRUCTION MITIGATION*

The modeling assessment for the combined cycle project shows that the construction activities and the PM10 from combustion sources used for heavy construction have the potential for causing significant PM10 and NO2 air quality impacts. The most feasible mitigation measure to limit these emissions is to have fugitive dust measures in place. As stated above, OMGC has proposed a number of control measures that will minimize fugitive dust emissions. Staff proposes that prior to the commencement of construction, that OMGC provide a fugitive dust maintenance plan that specifically spells out the mitigation measures that OMGC will employ to limit fugitive dust during construction. It is anticipated that the fugitive dust measures be implemented for all construction activities at the project site and associated linear facilities such as transmission lines and gas pipelines.

In order to address the PM10 and NO2 emissions in equipment exhaust, OMGC has proposed that they will require contractors to maintain their vehicles and equipment to limit exhaust emissions. Staff is recommending the diesel fuel be limited to no greater than 50 ppm sulfur to achieve further reductions in PM10 and PM10 precursors from construction equipment exhaust. Staff proposes that prior to the commencement of construction, that OMGC provide a construction equipment maintenance plan that specifically spells out the mitigation measures that OMGC will employ to limit construction equipment emissions. It is anticipated that the equipment exhaust mitigation measures be implemented for all construction activities at the project site and associated linears.

The current California standard for diesel fuel limits sulfur to 500 ppm. California on-road diesel averages 130 ppm sulfur, with some fuel distribution terminals selling 50 ppm or less sulfur diesel fuel. The ARB predicted as much as a 25 percent reduction of directly emitted PM10 and an 80 percent reduction of SO2, a PM10 precursor, with the implementation of the 500 ppm sulfur diesel standard ( ARB 1988). Staff believes that the use of 50 ppm sulfur diesel instead of 130 ppm diesel will reduce SO2 emission by as much as 60 percent, and reduce PM10 between 5 percent (Clean 2000) and 10 percent. Reducing sulfur in diesel fuel helps extend engine life by reducing corrosive wear. Additionally, lower sulfur diesel ensures a greater compatibility with post-combustion catalysts and soot filters, where they are appropriate (ARB 1998).

The oxidizing soot filter is a device that replaces the muffler of the construction equipment. It reduces CO and hydrocarbon (VOC) emissions by approximately 80-90% and PM10 emissions by approximately 90-99%. This technology has several operational constraints and the Conditions of Certification will be written to give the on-site engineer the latitude to remove the oxidizing soot filters when it is determined that they are not appropriate for the specific construction activity or equipment application.

### *OPERATIONS MITIGATION*

Staff is concerned that the project's PM10 and PM10 precursor (SO2 and VOC) emissions will contribute to existing violations of the state 24-hour and annual PM10 standards. Staff will work with the applicant to determine appropriate mitigation. Staff believes that there are opportunities for PM10 mitigation by:

- Pursuing a lower PM10 emission rate from the combustion turbines. Most projects under review or permitted by the CEC have PM10 emission rates one-half of that proposed for OMGP;
- Securing the PM10, SO2 and VOC reductions that will occur during the creation of the MERCs (NO2 emission reductions from the conversion of diesel engines to clean diesel and natural gas engines) and ERCs ( the "diesel to clean diesel" engine conversions);
- Adding oxidizing soot filters to the marine fleet engines (the "diesel to clean diesel" engine conversions for NO2 MERCs and ERCs) to create PM10 reductions;
- Fugitive dust control on dirt roads in the vicinity of the project site, and;
- Finalizing the NOx offset package.

Staff will work with the applicant and the District to identify and quantify PM10 mitigation for the OMGP.

## COMPLIANCE WITH LORS

### FEDERAL

The District's NSR permit process, which generated the PDOC (District 2000a), includes a Prevention of Significant Deterioration (PSD) permit process. The District is not doing a separate PSD permit review. Based on recent conversations with District and EPA staff, we are still uncertain how the timing of the biological assessment and opinion regarding endangered species will correlate to the finalization of the Final Determination of Compliance/PSD permit. However, we do not believe at this time that the biological portion of the PSD permit will affect project emissions or the air quality conditions of certification. The District will also issue a Title V permit for the facility upon operation of the project.

### STATE

The project, with the anticipated offsets that will be necessary to secure an Final Determination of Compliance from the San Diego County APCD, should comply with Section 41700 of the California State Health and Safety Code.

### LOCAL

The District issued a Preliminary Determination of Compliance (District 2000a) June 22, 2000. The District plans to issue their Final Determination of Compliance pending:

- a 30-day public review of the PDOC and resolution of comments;
- addition of the permit review and conditions for the diesel pump and the emergency diesel generators as part of the project DOC;
- completion of the applicant's negotiations to secure the necessary NOx offsets, or their equivalent; and
- final approval of the MERC environmental document and banking program.

The District has provided conditions of certification in the PDOC, which are included below with some modifications. Conditions will be added to require the surrender of the ERCs and MERCs by the applicant, and for the diesel engines at the project site. Other conditions may be modified based on comments received by the District on the PDOC and the MERC framework environmental report.

## CONCLUSIONS AND RECOMMENDATIONS

Based on the District's Preliminary Determination of Compliance, staff concludes that the project should comply with the District's Rules and Regulations, pending resolution of the MERC program environmental review, identification of a complete offset package, and resolution of comments on the PDOC.

Staff cannot recommend approval of the Otay Mesa Generation Company's OMGP at this time. Several issues critical to a complete air quality analysis are still unresolved. These include:

- Completion of the District's environmental review of the proposed mobile emission reduction credit banking program;
- Identification of a complete NOx offset package by the applicant;
- Release of the Final Determination of Compliance that should include permit conditions on the diesel engines;
- Calculation of the worst case commissioning CO and NO2 emissions based on Otay Mesa ambient air quality data.

Additionally, the proposed emission offsets for NOx do not adequately mitigate the project's potential emissions of VOC (as precursor to O3 and secondary PM10), SO2 (as precursor to secondary PM10) and directly emitted PM10. Staff, as discussed in the impacts section, believes that those emissions of VOC, SO2 and PM10 constitute and significant, unmitigated impact.

Staff is confident that they can work with the applicant, the District, and interested agencies to resolve these issues for inclusion in the Air Quality Final Staff Analysis. Staff believes that there are opportunities for PM10 and PM10 precursor mitigation by:

- Pursuing a lower PM10 emission rate from the combustion turbines. Most projects under review or permitted by the CEC have PM10 emission rates one-half of that proposed for OMGP;
- Securing the PM10, SO2 and VOC reductions that will occur during the creation of the MERCs (NO2 emission reductions from the conversion of diesel engines to clean diesel and natural gas engines);
- Adding oxidizing soot filters to the marine fleet engines (the "diesel to clean diesel" engine conversion for NO2 MERC and ERCs) to create PM10 reductions;
- Fugitive dust control on dirt roads in the vicinity of the project site and;
- Finalizing the NOx offset package.

## CONDITIONS OF CERTIFICATION

## DETERMINATION OF COMPLIANCE CONDITIONS

### *GENERAL CONDITIONS*

**AQ-1** Operation of this equipment shall be conducted in accordance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

**AQ-2** This equipment shall be properly maintained and kept in good operating condition at all times.

**Verification:** The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

**AQ-3** The project owner shall provide access, facilities, utilities, and any necessary safety equipment for source testing and inspection upon request of the Air Pollution Control District.

**Verification:** The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

## *CONSTRUCTION (AT OR PRIOR TO INITIAL FIRING) CONDITIONS*

**AQ-4** At least 90 days prior to the start of construction, 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 (SCONOx and SCR). Such information may be submitted to the District under Trade Secret and confidential provisions pursuant to District Rules 175 and 176.

**Verification:** 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 (SCONOx and SCR) to the CPM and the District at least 90 days prior to commencement of construction.

**AQ-5** The exhaust stacks for each turbine power station shall be at least 131 feet (39.9 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 (SCONOx and SCR) to the CPM and the District at least 90 days prior to commencement of construction.

**AQ-6** 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 commencement of construction.

**AQ-7** This equipment shall be fired using Public Utility Commission (PUC) quality natural gas only. The project owner shall maintain quarterly records of fuel

sulfur content (grains of sulfur compounds per 100 scf of natural gas) and higher heating value (Btu/scf) and shall make these records available to District personnel upon request.

**Verification:** These records shall be maintained on site for a minimum of three 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-8** 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 ($O_2$) 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 properly installed and certified, is in full operation at all times when the turbine is in operation.

**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-9** At least 60 days prior to initial firing of the gas turbines, the project owner shall submit a protocol to the District, for written approval, that shows how both the portable and permanent CEMS will be able to meet all District monitoring requirements and measure NOx emissions at a level of 1.0 ppmv plus or minus 10%. In the event that CEMS technology to measure NOx emissions at a level of 1.0 ppmv is not commercially available 60 days prior to initial startup, the project owner shall submit a report to the District regarding the status of the development of such technology and proposing an alternative measurement technique, for District approval, by which the project owner will monitor NOx emissions.

**Verification:** The project owner shall provide copies of the operating protocol for the CEMS system or a CEMS development status to the District, for written approval, and the CPM at least 60 days prior to the initial startup.

**AQ-10** At least 60 days prior to initial firing of the gas turbines, the project owner shall submit a protocol to the District for approval which shall specify a method for determining the CO/VOC surrogate relationship that shall be used to demonstrate compliance with all VOC emission limits.

**Verification:** The project owner shall provide copies of the operating protocol for the CO/VOC surrogate relationship used to demonstrate compliance with all VOC

limits to the District, for written approval, and the CPM at least 60 days prior to the initial firing of the gas turbines.

**AQ-11** Prior to initial firing, each turbine shall be equipped with continuous monitors to measure or calculate and record the following operational characteristics of each unit:

- natural gas flow rate (scfh),
- heat input rate (MMBtu/hr),
- exhaust gas flow rate (dscfm),
- exhaust gas temperature ($^{o}$F), and
- power output (MW).

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

**Verification:** The project owner shall provide copies of the operating protocol, including the calculation methodology for the CEMS system or a CEMS development status to the District, for written approval, and the CPM at least 60 days prior to initial firing of the gas turbines.

**AQ-12** All CEMS shall be certified, calibrated, maintained, and operated for the monitoring of NOx and CO in accordance with applicable regulations including the requirements of Sections 60.7(c), 60.7(d), and 60.13 of Title 40 Code of Federal Regulations Part 60 (40 CFR 60), Performance Standards of Appendix B of 40 CFR 60, Quality Assurance Procedures of Appendix F of 40 CFR 60 and 40 CFR 75, and a protocol approved in writing by the District.

**Verification:** These records shall be maintained on site for a minimum of three 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-13** The District shall be notified in writing at least two (2) weeks prior to any proposed changes to be made in any Continuous Emission Monitor (CEM) software which affects the value of data displayed on the CEM monitors with respect to the parameters measured by their respective sensing devices.

**Verification:** The project owner shall provide notices of any proposed changes made to the CEM software, which affects the value of data displayed on the CEM monitors with respect to the parameters measured by their respective sensing devices, to the District and the CPM at least two (2) weeks prior to the changes.

**AQ-14** 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 30 days of completion of this 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 30 days of the test.

**AQ-15** The total annual emissions of oxides of nitrogen (NOx), calculated as nitrogen dioxide, shall not exceed 100 tons per each consecutive 12-calendar month period. The NOx 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).

**Verification:** The project owner shall maintain records, at least on a calendar monthly basis, of total aggregate mass emissions of NOx, 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 three 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-16** The project owner shall maintain records, at least on a calendar monthly basis, of total aggregate mass emissions of NOx, 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 three 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, 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 three 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-17** When operating without any post-combustion air pollution control equipment, the emissions of oxides of nitrogen (NOx), calculated as nitrogen dioxide, from each turbine shall not exceed 19.8 parts per million by volume on a dry basis (ppmvd) calculated over a 1-hour averaging period and corrected to 15% oxygen, excluding startups and shutdowns as defined in District Rule 69.3.1.

**Verification:** The project owner shall maintain records of the NOx emission concentrations 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 three 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-18** When operating with post-combustion air pollution control equipment, emissions of oxides of nitrogen (NOx), calculated as nitrogen dioxide, shall not exceed 11.8 parts per million by volume on a dry basis (ppmvd) calculated over a 1-hour averaging period and corrected to 15% oxygen, excluding startups and shutdowns as defined in District Rule 69.3.1.

**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 three 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-19** When operating without any post-combustion air pollution control equipment, the total emissions from both turbines combined shall not exceed 1649 pounds per hour of oxides of nitrogen (NOx), calculated as nitrogen dioxide. 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 three 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-20** 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. 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. 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 three 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-21** When operating at less than 40% load, the emissions of carbon monoxide (CO) shall not exceed 2500 ppm averaged over a 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 three 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.

## *COMMISSIONING PERIOD CONDITIONS*

**AQ-22** 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 emission limits specified in Condition Nos. 15, 17, 18, 19, 20 and 21 shall apply. 1

**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 three years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

**AQ-23** 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. 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.

**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.

**AQ-24** 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 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-25** 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 three 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-26** 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 (CEMS) and the District approved CO/VOC surrogate relationship, as well as the limits specified in Condition Nos. 15, 17, 18, 19, 20 and 21:

| Pollutant | Emission Limit, ppmvd |
|---|---|
| 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 three 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-27** If the equipment is unable to meet the emission requirements of the Optimization Period, 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 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.

**AQ-28** 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.

**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-29** 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. 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-30** 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. 15, 17, 18, 19, 20 and 21 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 three 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-31** 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-32** 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 three 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-33** For the purposes of the District's Determination of Compliance and Authority to Construct, on-going operation of the turbines shall commence immediately following the end of the Optimization Period unless a Replacement Period is required or immediately upon the end of the Commissioning Period if the project owner elects to install an SCR system. In such case, on-going operations shall commence immediately following

the Replacement Period. Condition Nos. 15, 17, 18, 19, 20 and 21 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 three 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-34** The emissions of oxides of nitrogen (NOx) 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 this limit shall be based on CEMS data for each unit and averaged over each continuous 3-hour period, excluding hours when the equipment is operated under startup conditions. Compliance with this limit shall also be verified through an initial source test and 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 three 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-35** In the event the project owner elects to install the SCONOx system, the project owner shall undertake all reasonable efforts to achieve continuous NOx emissions below current BACT/LAER standards. At least 30 days prior to initial firing, the project owner shall submit to the District a protocol for achieving optimum operation of the SCONOx system and a NOx emission concentration of 1.0 ppm. 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 to achieve maximum operation of the SCONOx system and 1.0 ppm NOx concentration to the District and the CPM at least 30 days prior to initial firing of the gas turbines.

**AQ-36** 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 continuous 3-hour period, excluding hours when the equipment is operated under startup conditions. Compliance with this limit shall also be verified through an initial source test and 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 three 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-37** The emissions of volatile organic compounds (VOC) 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 CO emission limits and the District approved CO/VOC surrogate relationship shall be 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 three 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-38** When operated without power augmentation, the emissions from each turbine shall not exceed the following emission limits as determined by the Continuous Emissions Monitoring System (CEMS) and continuous monitors:

| Pollutant | Emission Limit, lbs/hr |
|---|---|
| Oxides of Nitrogen, NOx (calculated as NO2) | 12.8 |
| Carbon Monoxide, CO | 23.4 |
| Volatile Organic Compounds, VOC | 2.8 |

**Verification:** The project owner shall maintain records of the mass emissions and concentrations of each gas turbine when operating without power augmentation. These records shall be maintained on site for a minimum of three 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-39** When operated with power augmentation, the emissions from this equipment shall not exceed the following emission limits as determined by the Continuous Emissions Monitoring System (CEMS), the District approved CO/VOC surrogate relationship, and continuous monitors:

| Pollutant | Emission Limit, lbs/hr |
|---|---|
| Oxides of Nitrogen, NOx (calculated as NO2) | 14.0 |
| Carbon Monoxide, CO | 29.4 |
| Volatile Organic Compounds, VOC | 3.8 |

**Verification:** The project owner shall maintain records of the mass emissions and concentrations of each gas turbine when operating with power augmentation. These records shall be maintained on site for a minimum of three 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-40** This equipment shall not operate with power augmentation for more than 1800 hrs per turbine per rolling 365-day period. The project owner shall maintain a logbook, which shall contain, at a minimum, the dates and time when one or both turbines are operated with power augmentation. This log shall be maintained on site for a minimum of three years and made available to District personnel upon request.

**Verification:** The project owner shall maintain records of the operation of the gas turbine with power augmentation. These records shall be maintained on site for a minimum of three 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-41** When operated under hot/warm startup conditions, the emissions from each turbine shall not exceed the following emission limits as determined by the Continuous Emissions Monitoring System (CEMS), the District approved CO/VOC surrogate relationship, and continuous monitors:

| Pollutant | Emission Limit, lbs/hr |
|---|---|
| Oxides of Nitrogen, NOx (calculated as NO2) | 44.0 |
| Carbon Monoxide, CO | 600 |
| Volatile Organic Compounds, VOC | 39.0 |

**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 three 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-42** When operated under cold startup conditions, the emissions from each turbine shall not exceed the following emission limits as determined by the

Continuous Emissions Monitoring System (CEMS), the District approved CO/VOC surrogate relationship, and continuous monitors:

| Pollutant | Emission Limit (first hour), lbs/hr |
|---|---|
| Oxides of Nitrogen, NOx (calculated as NO2) | 44.0 |
| Carbon Monoxide, CO | 887 |
| Volatile Organic Compounds, VOC | 49.0 |

**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 three 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-43** Hot/warm startup shall be defined as the time, 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 three 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-44** Cold startup shall be defined as the time, 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 startups of each gas turbine. These records shall be maintained on site for a minimum of three 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-45** Both gas turbines shall not be operated simultaneously in cold startup mode.

**Verification:** The project owner shall maintain records of the duration of cold startups of each gas turbine. These records shall be maintained on site for a minimum of three 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-46** The project owner shall maintain a log of all startups. The log shall contain, at a minimum, the type of startup, the dates and times of each startup, and the duration of each startup. This log shall be maintained on site for a minimum of three years and made available to District personnel upon request.

**Verification:** The project owner shall maintain records of the duration of all startups of each gas turbine. These records shall be maintained on site for a minimum of three 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-47** The emissions of particulate matter less than 10 microns ($PM_{10}$) shall not exceed 18.0 lbs/hr. Compliance with this limit shall be based on an initial compliance test and annual source testing thereafter.

**Verification:** The project owner shall provide copies of the initial 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-48** 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 source test shall be conducted 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 (NOx), carbon monoxide (CO), and stack gas oxygen content shall be conducted in accordance with the San Diego Air Pollution Control District Method 100, 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.

c. Measurements of volatile organic compounds (VOC) shall be conducted in accordance with San Diego Air Pollution Control District Methods 18 and 25A.

d. Source testing shall be performed at no less than 80% of the turbine rating without power augmentation.

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 (MW),

**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-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 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):

| Pollutant | Emission Limit, lbs/hr |
|---|---|
| Acetaldehyde | 0.08 |
| Acrolein | 0.03 |
| Benzene | 0.015 |
| Ethyl Benzene | 0.02 |
| Formaldehyde | 2.33 |
| Naphthalene | 0.0019 |
| Polyaromatic Hydrocarbons (PAHs) | 0.0017 |
| Toluene | 0.08 |
| Xylene | 0.03 |

**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-50** Within 60 days after completion of the initial source tests, a final test report shall be submitted to the District for review and approval. The testing contractor shall include, as part of the test report, a certification that to the best of his knowledge the report is a true and accurate representation of the test conducted and the results.

**Verification:** The project owner shall provide copies of the final source test report to the District, for review and written approval, and the CPM within 60 days after the completion of the initial compliance test testing.

**AQ-51** The final test report for the initial source tests shall also include a method for establishing a VOC/HAP surrogate relationship. This relationship, in

conjunction with the CO/VOC surrogate relationship, shall be used to show continued compliance with all HAPs emission limits.

**Verification:** The project owner shall provide copies of the of the final source test report with a method to establish a VOC/HAP surrogate relationship to the District, for review and written approval, and the CPM within 60 after the completion of the initial compliance test testing.

**AQ-52** This equipment shall be source tested on an annual basis to show continued compliance with all applicable emission limits, using District approved methods, unless otherwise directed in writing by the District.

**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.

**AQ-53** The emissions of any single federal hazardous air pollutant, and the aggregate of all federal hazardous air pollutants, shall not equal or exceed 10 tons or 25 tons, respectively, in any continuous 12 calendar month period. If emissions exceed these limits, the permittee shall apply to amend these limits and conduct a case-by case Maximum Achievable Control Technology (MACT) analysis in accordance with applicable federal EPA regulations.

**Verification:** The project owner shall maintain records of the mass emissions of the hazardous air pollutants of each gas turbine when operating. These records shall be maintained on site for a minimum of three 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.

## *EMISSION OFFSET CONDITIONS*

**AQ-54** Prior to the initial firing of this equipment, the project owner shall surrender to the District Class A Emission Reduction Credits (ERCs) or Mobile Emission Reduction Credits (MERCs) in an amount equivalent to 120 tons per year of NOx to offset the maximum potential to emit NOx emissions from this facility.

**Verification:** The project owner shall provide copies of the ERC or MERC certificates to the District and the CPM prior to the combustion of fuel in the gas turbines.

**AQ-55** Beginning with the start of the ongoing emission reduction monitoring period, the owner or operator shall, on or before the last day of the second calendar month following the end of each ongoing emission reduction monitoring year:

(a) For each ongoing emission reduction monitoring year, based on the quarterly activity levels submitted by the mobile source owners and the applicable calculation method specified in “Alternative Mobile Source

Emission Reduction Programs for Replacing Heavy-Heavy and Medium-Heavy Duty Diesel Powered Vehicles and Repowering of Marine Vessels" as it exists on [date of approval], perform a calculation of the annual average and annual aggregate ongoing emission reductions and the ongoing emission reduction deficit, if any, for the MERCs surrendered to offset the facility's emissions;

(b) Provide an annual report to the District that summarizes the annual average ongoing emission reductions for each MERC, aggregate ongoing emission reductions, and the ongoing emission reduction deficit, if any, and provides supporting calculations and documentation; and

(c) If the calculated annual ongoing emission reduction deficit is positive, notify the District, provide a compliance schedule to correct the ongoing emission reduction deficit, and correct the ongoing emission reduction deficit in accordance with Subsection (h)(4) of "Alternative Mobile Source Emission Reduction Programs for Replacing Heavy-Heavy and Medium-Heavy Duty Diesel Powered Vehicles and Repowering of Marine Vessels" as it exists on [date of approval] unless the deficit correction is waived pursuant to Subsection (h)(5).

**Verification:** The project owner shall submit an annual MERC report to the District and the CPM on or before the last day of the second calendar month following the end of each ongoing emission reduction monitoring year.

**AQ-56** Beginning with the second calendar year following the calendar year that the facility commences operations, the owner or operator shall, on or before March 1 of each calendar year:

(a) Based on information supplied by the mobile source owners for each MERC surrendered to the District, notify the District if the MERC fractional employment is less than 0.8;

(b) Based on information supplied by the mobile source owners for each MERC surrendered to the District, notify the District if the MERC fractional employment in primary service is less than 0.8; and

(c) If one or more MERCs fractional employment or fractional employment in primary service is less than 0.8, provide a compliance schedule to correct any MERC shortfall and correct any MERC shortfall in accordance with Subsection (j)(4) of "Alternative Mobile Source Emission Reduction Programs for Replacing Heavy-Heavy and Medium-Heavy Duty Diesel Powered Vehicles and Repowering of Marine Vessels" as it exists on [date of approval] unless the shortfall correction is waived pursuant to Subsection (j)(5).

**Verification:** The project owner shall submit a report on MERC monitoring to the District and the CPM on or before March 1 of each calendar year.

**AQ-57** The permittee may apply for the refund of any unneeded ERCs or MERCs, or portion thereof, surrendered to the District to provide offsets for the facility's NOx emissions. To obtain such a refund the permittee must demonstrate a lower emission rate than the emission rate on which the total offset amount was based and accept practicably enforceable permit conditions that reduce potential NOx emissions to that lower level and apply for the refund within 3 calendar years of the District's approval of the initial permit to operate. Any MERCs or portions thereof, shall be refunded and have their lifetimes and lifetime beginning date adjusted in accordance with Section (m) and Subsection (f)(5), respectively, of "Alternative Mobile Source Emission Reduction Programs for Replacing Heavy-Heavy and Medium-Heavy Duty Diesel Powered Vehicles and Repowering of Marine Vessels" as it exists on [date of approval], respectively.

**Verification:** The project owner shall submit any request for a refund of any unneeded NOx ERCs or MERCs or portion thereof to the District and the CPM within three (3) calendar years of the District's approval of the initial permit to operate.

**AQ-58** Twenty (20) years after the initial firing of the equipment, the emissions of oxides of nitrogen (NOx) 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, optimization, replacement and operation. These records shall be maintained on site for a minimum of three 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.

## *ADDITIONAL GENERAL CONDITIONS*

**AQ-59** All records required by these conditions shall be maintained on site for a minimum of three 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, optimization, replacement and operation. These records shall be maintained on site for a minimum of three 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-60** Pursuant to 40 CFR 72.30(b)(2)(ii) of the Federal Acid Rain Program, the project owner shall submit an application for a Title IV Operating Permit at least 24 months prior to the initial startup of this equipment.

**Verification:** The project owner shall submit an application for a Title IV Operating Permit to the District, and provide a copy of the application to the CPM, at least 24 months prior to the initial startup.

**AQ-61** The project owner shall comply with the continuous emission monitoring requirements of 40 CFR Part 75.

**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 three 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-62** The project owner shall submit an application to the District for a Federal (Title V) Operating Permit, in accordance with District Regulation 14 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-63 through AQ-69 are reserved for future use.

# ENGERY COMMISSION STAFF CONDITIONS

## *CONDITIONS OF CERTIFICATION – CONSTRUCTION*

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

For the purposes of these conditions, the following definitions apply:

(1) ACTIVE OPERATIONS shall mean any activity capable of generating fugitive dust, including, but not limited to, earth-moving activities, construction/demolition activities, or heavy- and light-duty vehicular movement.

(2) CHEMICAL STABILIZERS mean any non-toxic chemical dust suppressant which must not be used if prohibited for use by the Regional Water Quality Control Boards, the California Air Resources Board, the U.S. Environmental Protection Agency (U.S. EPA), or any applicable law, rule or regulation; and should meet any specifications, criteria, or tests required by any federal, state, or local water agency. Unless otherwise indicated, the use of a non-toxic

chemical stabilizer shall be of sufficient concentration and application frequency to maintain a stabilized surface.

(3) CONSTRUCTION/DEMOLITION ACTIVITIES are any on-site mechanical activities preparatory to or related to the building, alteration, rehabilitation, demolition or improvement of property, including, but not limited to the following activities; grading, excavation, loading, crushing, cutting, planing, shaping or ground breaking.

(4) DISTURBED SURFACE AREA means a portion of the earth's surface which has been physically moved, uncovered, destabilized, or otherwise modified from its undisturbed natural soil condition, thereby increasing the potential for emission of fugitive dust.

(5) DUST SUPPRESSANTS are water, hygroscopic materials, or non-toxic chemical stabilizers used as a treatment material to reduce fugitive dust emissions.

(6) EARTH-MOVING ACTIVITIES shall include, but not be limited to, grading, earth cutting and filling operations, loading or unloading of dirt or bulk materials, adding to or removing from open storage piles of bulk materials, landfill operations, or soil mulching.

(7) FUGITIVE DUST means any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of man.

(8) INACTIVE DISTURBED SURFACE AREA means any disturbed surface area upon which active operations have not occurred or are not expected to occur for a period of ten consecutive days.

(9) STABILIZED SURFACE means:
(A) any disturbed surface area or open storage pile which is resistant to wind-driven fugitive dust;
(B) any unpaved road surface in which any fugitive dust plume emanating from vehicular traffic does not exceed 20 percent opacity.

(10) VISIBLE ROADWAY DUST means any sand, soil, dirt, or other solid particulate matter which is visible upon paved road surfaces and which can be removed by a vacuum sweeper or a broom sweeper under normal operating conditions.

**AQ-70** The project owner shall implement a CEC CPM approved fugitive Dust Control Plan.

Protocol: The plan shall include the following:
1. A description of each of the active operation(s) which may result in the generation of fugitive dust;
2. An identification of all sources of fugitive dust (e.g., earth-moving, storage piles, vehicular traffic, etc.

3. A description of the control measures to be applied to each of the sources of dust emissions identified above (including those required in AQ-47 below). The description must be sufficiently detailed to demonstrate that the applicable best available control measure(s) will be utilized and/or installed during all periods of active operations;
4. In the event that there are special technical (e.g., non-economic) circumstances, including safety, which prevent the use of at least one of the required control measures for any of the sources identified, a justification statement must be provided to explain the reason(s) why the required control measures cannot be implemented.

**Verification:** Not later than sixty (60) days prior to the commencement of construction, the project owner shall submit the plan to the CEC CPM for review and approval. The project owner shall maintain daily records to document the specific actions taken pursuant to the plan. A summary of the monthly activities shall be submitted to the CPM via the Monthly Compliance Report.

**AQ-71** During the construction phase of the project, the project owner shall:

1. Prevent or remove within one hour the track-out of bulk material onto public paved roadways as a result of their operations, or take at least one of the actions listed in Table 2 (attached) to prevent the track-out of bulk material onto public paved roadways as a result of their operations and remove such material at anytime track-out extends for a cumulative distance of greater than 50 feet on to any paved public road during active operations;
2. Install and use a track-out control device to prevent the track-out of bulk material from areas containing soils requiring corrective to other areas within the project construction site and laydown area;
3. Minimize fugitive particulate emissions from vehicular traffic on paved roads and paved parking lots on the construction site by vacuum mechanical sweeping or water flushing of the road surface to remove buildup of loose material. The project owner shall inspect on a daily basis the conditions of the paved roads and parking lots to determine the need for mechanical sweeping or water flushing.

**Verification:** The project owner shall maintain a daily log during the construction phase of the project indicating: 1) the manner in which compliance with this condition is achieved and 2) the date and time when the inspection of paved roads and parking lots occurs and the date and time(s) when the cleaning operation occurs. The logs shall be made available to the California Energy Commission CPM upon request.

**AQ-72** At any time when fugitive dust from OMGP project construction is visible in the atmosphere beyond the property line, the project owner will identify the source of the fugitive dust and implement one or more of the appropriate control measures specified in Table 3 (attached)

**Verification:** The project owner will maintain a daily log recording the dates and times that measures in Table 3 (attached) have been implemented and make them available to the CPM upon request.

**AQ-73** The project owner shall implement an approved Construction Equipment Plan. The Plan shall identify how the project owner will ensure that all heavy equipment, that includes, but is not limited to, bulldozers, backhoes, compactors, loaders, motor graders and trenchers, and cranes, dump trucks and other heavy duty construction related trucks, used on-site by construction contractors and subcontractors:

a. are properly maintained;
b. use low sulfur diesel fuel;
c. limit idling times; and
d. meet federal emission standards for construction equipment.

**Verification:** Not later than sixty (60) days prior to the commencement of construction, the project owner shall submit the plan to the California Energy Commission CPM for review and approval. The project owner shall maintain records to document the specific actions taken pursuant to the plan. A summary of the monthly activities shall be submitted to the CPM via the Monthly Compliance Report.

**AQ-74** The project owner shall ensure that all heavy earthmoving equipment including, but not limited to, bulldozers, backhoes, compactors, loaders, motor graders and trenchers, and cranes, dump trucks and other heavy duty construction related trucks, have been properly maintained and the engines tuned to the engine manufacturer's specifications. The project owner shall also install oxidizing soot filters on all suitable construction equipment used either on the power plant construction site or associated linear construction sites. Where the oxidizing soot filter is determined to be unsuitable, the owner shall install and use an oxidizing catalyst. Additionally, the project owner shall employ high pressure fuel injection, timing retardation, and reduced idle time on all suitable construction equipment. Suitability is to be determined by an independent California Licensed Mechanical Engineer or a Qualified Environmental Professional who will stamp and submit for approval an initial and all subsequent Suitability Reports as necessary containing at a minimum the following:

Initial Suitability Report:

- The initial suitability report shall be submitted to the CPM for approval 60 days prior to the relevant equipment being used at the project site.
- A list of all fuel burning, construction related equipment used,
- a determination of the suitability of each piece of equipment to work appropriately with an oxidizing soot filter, or an oxidizing catalyst,
- if a piece of equipment is determined to be suitable, a statement by the equipment or catalyst manufacturers, the independent California Licensed

Mechanical Engineer, or a Qualified Environmental Professional that the oxidizing soot filter has been installed and is functioning properly,

- if a piece of equipment is determined to be unsuitable, an explanation by the equipment or catalyst manufacturers, the independent California Licensed Mechanical Engineer, or a Qualified Environmental Professional as to the cause of this determination, and
- a statement by the equipment or catalyst manufacturers, the California Licensed Mechanical Engineer, or a Qualified Environmental Professional as to the suitability of using high-pressure fuel injectors, timing retardation and/or reduced idle time on all construction equipment after the installation of either oxidizing soot filters or oxidizing catalysts.

Subsequent Suitability Reports

- If a piece of construction equipment is subsequently determined to be unsuitable for an oxidizing soot filter after such installation has occurred, the filter may be removed immediately. However notification must be sent to the CPM for approval containing an explanation for the change in suitability within 10 days.
- Changes in suitability are restricted to three explanations, which must be identified in any subsequent suitability report. Changes in suitability may not be based on the use of high-pressure fuel injectors, timing retardation and/or reduced idle time.

  1. The oxidizing soot filter is reducing normal availability of the construction equipment due to increased downtime, and/or power output due to increased back pressure by 20% or more.
  2. The oxidizing soot filter is causing or reasonably expected to cause significant damage to the construction equipment engine.
  3. The oxidizing soot filter is causing or reasonably expected to cause a significant risk to nearby workers or the public.

  Changes in suitability may not be based on the use of high-pressure fuel injectors, timing retardation and/or reduced idle time.

**Verification:** The project owner shall submit to the CPM, via the Monthly Compliance Report, documentation, which demonstrates that the contractor's heavy earthmoving equipment is properly maintained and the engines are tuned to the manufacturer's specifications. The project owner shall maintain all records on the site for six months following the start of commercial operation. The project owner will submit to the CPM for approval, the initial suitability report stamped by an independent California Licensed Mechanical Engineer or a Qualified Environmental Professional, 60 days prior to breaking ground on the project site. The project owner will submit to the CPM for approval, subsequent suitability reports as required, stamped by an independent California Licensed Mechanical Engineer or a Qualified Environmental Professional, no later than 10 working day following a change in the suitability status of any construction equipment.

## TABLE 1
## BEST AVAILABLE FUGITIVE DUST CONTROL MEASURES

| FUGITIVE DUST SOURCE CATEGORY | CONTROL ACTIONS |
|---|---|
| Earth-moving (except construction cutting and filling areas, and mining operations) | Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the CEC CPM. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; OR |
| | For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction. |
| Earth-moving: Construction fill areas: | Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the CEC CPM. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the CEC CPM, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations. |
| Earth-moving: Construction cut areas and mining operations: | Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors. |
| Disturbed surface areas (except completed grading areas) | Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind driven fugitive dust must have an application of water at least twice per day to at least 80 percent of the unstabilized area. |
| Disturbed surface areas: Completed grading areas | Apply chemical stabilizers within five working days of grading completion; OR |
| | Take actions (3a) or (3c) specified for inactive disturbed surface areas. |
| Inactive disturbed surface areas | Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; OR |
| | Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR |
| | Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR |
| | Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas. |
| Unpaved Roads | Water all roads used for any vehicular traffic at least once per every two hours of active operations; OR |
| | Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; OR |
| | Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface. |
| Open storage piles | Apply chemical stabilizers; OR |
| | Apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; OR |
| | Install temporary coverings; OR |
| | Install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile. |
| ALL CATEGORIES | Any other control measures approved by the CEC CPM as equivalent to the methods specified in Table 1 may be used. |

## TABLE 2

**TRACK-OUT CONTROL OPTIONS**

| | |
|---|---|
| (1) | Pave or apply chemical stabilization at sufficient concentration and frequency to maintain a stabilized surface starting from the point of intersection with the public paved surface, and extending for a centerline distance of at least 100 feet and a width of at least 20 feet. |
| (2) | Pave from the point of intersection with the public paved road surface, and extending for a centerline distance of at least 25 feet and a width of at least 20 feet, and install a track-out control device immediately adjacent to the paved surface such that exiting vehicles do not travel on any unpaved road surface after passing through the track-out control device. |
| (3) | Any other control measures approved by the CEC CPM as equivalent to the methods specified in Table 2 may be used. |

## TABLE 3
## CONTROL MEASURES FOR WIND CONDITIONS EXCEEDING 25 MPH

| FUGITIVE DUST SOURCE CATEGORY | CONTROL MEASURES |
|---|---|
| Earth-moving | Cease all active operations; OR |
| | Apply water to soil not more than 15 minutes prior to moving such soil. |
| Disturbed surface areas | On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; OR |
| | Apply chemical stabilizers prior to wind event; OR |
| | Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; OR |
| | Take the actions specified in Table 1, Item (3c); OR |
| | Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas. |
| **Unpaved roads** | Apply chemical stabilizers prior to wind event; OR |
| | Apply water twice [once] per hour during active operation; OR |
| | Stop all vehicular traffic. |
| **Open storage piles** | Apply water twice [once] per hour; OR |
| | Install temporary coverings. |
| **Paved road track-out** | Cover all haul vehicles; OR |
| | Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads. |
| **All Categories** | Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 3 may be used. |

## REFERENCES


ARB 1988. Air Resources Board, Stationary Source Division, Proposed Adoption of Regulations Limiting the Sulfur Content and Aromatic Hydrocarbon Content of Motor Vehicle Diesel Fuel, October 1988.

ARB 1992. California Air Resources Board, "Sources and Control of Nitrogen Emissions", Sacramento, August. p. 38

ARB 1996. Air Resources Board. "Second Triennial Review of the Assessment of the Impacts of Transported Pollutants on Ozone Concentrations in California", October 1996.

ARB 2000a. California Air Quality Data, Annual and Quarterly Summaries, Aerometric Division, Sacramento.

ARB 2000b Air Resource Board. "Proposed Amendments to the Designation Criteria and Amendments to the Area Designations for State Ambient Air Quality Standards"

Clean 2000. Clean Diesel Technologies, Test Results Confirm that a Platinum/Cerium Diesel Fuel Combustion Catalyst Equals or Exceeds Low Sulfur Diesel Fuel in Reduction Particulate Emissions from a Heavy Duty Diesel Engine, News Bulletin, January 10, 2000.

District 2000a. Preliminary Determination of Compliance, Application Numbers 973880, 973881 and amended by 974980 and 974981, San Diego Air Pollution Control District, June 22, 2000.

District 2000b. San Diego Air Pollution Control District Rulebook, July 2000.

EPRI 1990. "Combustion Turbine NOx Control News." Electric Power Research Institute. RP 2936, Summer 1990, Issue 3.

Kehlhofer, Rolf H, et al, 1999. Combined –Cycle Gas & Steam Turbine Power Plants, 2nd Edition, 1999.

OMGC 1999a. Application for Certification, Otay Mesa Generating Project (99-AFC-5), August 1999.

OMGC 1999b Otay Mesa Generating Project (99-AFC-5) Data Adequacy Responses 1999.

OMGC 2000a Otay Mesa Generating Project (99-AFC-5) Supplementary AFC Filing, March 2000a

OMGC 2000b Otay Mesa Generating Project (99-AFC-5) Revised AERMOD Ozone Limiting Results for Otay Mesa Generating Project for Commissioning Phase, 1 and 2 turbine configuration. July 31, 2000 (?).

Tater, George, 2000. Personal report of conversation with George Tater, Plant Manager, El Dorado Energy Power Project, Henderson, Nevada. May 5, 2000.