Bay Area Air Quality Management District

939 Ellis Street
San Francisco, CA 94109
(415) 771-6000

Permit Evaluation
and
Statement of Basis
for

RENEWAL of
MAJOR FACILITY REVIEW PERMIT
for
Duke Energy Oakland LLC
Facility #B1887

Facility Address:
50 Martin Luther King Jr. Way
Oakland, CA 94607

Mailing Address:
P O Box 690
Moss Landing, CA 95039

BAAQMD Site Engineer: Sanjeev Kamboj
June 2005
Application #: 10656

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Permit Evaluation/Statement of Basis for Renewal of Major Facility Review Permit

A. Background

This facility is subject to the Operating Permit requirements of Title V of the federal Clean Air Act, Part 70 of Volume 40 of the Code of Federal Regulations (CFR), and BAAQMD Regulation 2, Rule 6, Major Facility Review because it is a "major facility" as defined by BAAQMD Regulation 2-6-212. It is a "major facility" because it has the potential to emit as defined by BAAQMD Regulation 2-6-218 more than 100 tons per year of a regulated air pollutant.

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

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

Each facility in the Bay Area is assigned a facility identifier that consists of a letter and a 4-digit number. This identifier is also considered to be the identifier for the permit. The identifier for this facility is B1887.

This facility received its initial Major Facility Review permit on March 22, 2000. This application is for a renewal of the Title V permit. The standard sections of the permit have been upgraded to include new standard language used in all Title V permits. Also, various other corrections have been made to the permit.

The facility has eight permitted sources and one exempt source.

All of these revisions are described below in the permit content section. The proposed permit shows all changes to the permit in strikeout/underline format.

The facility has submitted 3 applications since the Major Facility Review permit was issued on March 22, 2000. Following is a list of the applications:

Application #	Description	Date of Receipt
10656	Title V Permit Renewal	08/27/04
6385	New Source	09/19/02
2280	Modification	01/19/01

Application 10656 is for renewal of the Title V permit, which is the subject of this action.

Application 6385 was submitted for the purpose of obtaining a permit to operate for an existing standby generator powered by a diesel engine S-20. This engine was in operation since 1998 and was thus installed before May 17, 2000 when Regulation 1 and Regulation 2-1 were modified to require engines greater than 50 HP to require a Permit to Operate. As such, S-20 constituted a Loss-Of-Exemption source not subjected to Regulations 2-1-301 or 2-1-302 ("new" and "modified sources"). The engineering evaluation of this application is contained in Appendix C to this permit evaluation/statement of basis.

Application 2280 was submitted to modify Condition #2571 (for S1-S6, Gas Turbines), Item 6 to indicate that the maximum total operating time of the 6 gas turbines combined shall be limited to 5,000 hours in any calendar year instead of 5000 hours in any 12 consecutive month period. This modification was prompted by the request of the California Independent System Operator (ISO) letter dated January 17, 2001 to Duke and as a consequence of the state of emergency that was declared in California due to an extreme energy supply deficiency. The purpose of the modification was to place the 5,000-hour limitation on a calendar year, rather than on a 12-month rolling basis. After this modification was made, the "5,000-hour clock" began at zero on January 1, 2001, and allowed Duke to resume operation of the six turbines, thereby providing badly-needed electricity to the State's power grid, as requested by the ISO. Application 2280 was folded into Application 6385 that was submitted later.

These applications have resulted in no change in emissions.

B. Facility Description

The facility is a power plant. It has six 365 MMbtu/hr gas turbines (S1-S6) that have permits to burn distillate oil or lighter fuel oil. Each turbine runs less than 877 hours/yr pursuant to District Regulation 9-9-302. It also has one Wipe Cleaning Operation (S9) and one Emergency Standby Diesel Engine (S20). Total solvent evaporation from S9 is limited to 20 gallons in any consecutive twelve-month period. Operation of S20, Emergency Standby Engine, is limited to 100 hours in a calendar year per Regulation 9-8-330.

C. Permit Content

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

I. Standard Conditions

This section contains administrative requirements and conditions that apply to all facilities. Many of these conditions derive from 40 CFR § 70.6, Permit Content, which dictates certain standard conditions that must be placed in the permit. The language that the District has developed for many of these requirements has been adopted into the BAAQMD Manual of Procedures, Volume II, Part 3, Section 4, and therefore must appear in the permit.

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

Changes to permit:

- The rule dates in Standard Condition I.A have been updated.
- Standard Condition I.B.1 has been amended to state that the permit continues in force after the expiration date if a complete application has been submitted in accordance with the renewal deadlines. This is the "application shield" pursuant to BAAQMD Regulation 2-6-407.
- Standard Condition I.B.11 has been added in accordance with the Manual of Procedures, Chapter 3, as revised on May 2, 2001.
- The following language was added as Standard Condition I.B.12: "The permit holder is responsible for compliance, and certification of compliance, with all conditions of the permit, regardless whether it acts through employees, agents, contractors, or subcontractors. (Regulation 2-6-307)." The purpose is to reiterate that the Permit Holder is responsible for ensuring that all activities at the facility comply with all applicable requirements.
- Standard Condition I.E.1 has been added to require any information, records, and reports requested or specified by the APCO.
- Standard Conditions I.F, I.G, and I.H were modified to conform to the current standard.
- Standard Condition I.J has been added to clarify that the capacity limits shown in Table II-A are enforceable limits.

II. Equipment

This section of the permit lists all permitted or significant sources. Each source is identified by an S and a number (e.g., S9).

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

Significant sources are those sources that have a potential to emit of more than 2 tons of a “regulated air pollutant,” as defined in BAAQMD Rule 2-6-222, per year or 400 pounds of a “hazardous air pollutant,” as defined in BAAQMD Rule 2-6-210, per year.

Major Facility Review permits list all abatement (control) devices. This facility has no control devices.

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

Each of the permitted sources has previously been issued an authority to construct or a permit to operate pursuant to the requirements of BAAQMD Regulation 2, Permits. These permits are issued in accordance with state law and the District’s regulations.

Changes to permit:
Standard language has been added to this section stating that the capacities in this table are the maximum allowable capacities for each source, pursuant to Standard Condition I.J and Regulation 2-1-403.

Source S20, Emergency Standby Diesel Engine, has been added to the equipment list. The capacity in Horse Power (HP) has also been included for S20.

III. Generally Applicable Requirements

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

Unpermitted sources are exempt from normal District permits pursuant to an exemption in BAAQMD Regulation 2, Rule 1. They may, however, be specifically described in a Major Facility Review permit if they are considered significant sources pursuant to the definition in BAAQMD Rule 2-6-239.

Changes to permit:
Language has been added to Section III to clarify that this section contains requirements that may apply to temporary sources. This provision allows contractors that have "portable" equipment permits that require them to comply with all applicable requirements to work at the facility on a temporary basis, even if the permit does not specifically list the temporary source. Examples are temporary sandblasting or soil-vapor extraction equipment.

Section III has been modified to state that SIP standards are now found on EPA's website and are not included as part of the permit.

The note regarding SIP information from the Rule Development Section has been deleted since the SIP standards are now found on EPA's website.

Table III has been updated by adding the following rules and standards to conform to current practice:

- BAAQMD Regulation 2, Rule 1, General Requirements
- BAAQMD 2-1-429, Federal Emissions Statement
- SIP Regulation 2, Rule 1, General Requirements
- SIP Regulation 5, Open Burning
- SIP Regulation 8, Rule 3, Architectural Coating
- BAAQMD Regulation 8, Rule 40
- BAAQMD Regulation 8, Rule 47
- SIP Regulation 8, Rule 51, Adhesive and Sealant Products
- SIP Regulation 12, Rule 4, Miscellaneous Standards of Performance-Sandblasting

- California Health and Safety Code Section 41750 et seq., Portable Equipment
- California Health and Safety Code Section 44300 et seq., Air Toxics "Hot Spots" Information and Assessment Act of 1987
- EPA Regulation 40 CFR Part 61, Subpart M

The dates of adoption or approval of the rules and their "federal enforceability" status in Table III have also been updated.

IV. Source-Specific Applicable Requirements

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

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

Section IV of the permit contains citations to all of the applicable requirements for particular sources. The text of the requirements is found in the regulations, which are readily available on the District's or EPA's websites, or in the permit conditions, which are found in Section VI of the permit. All monitoring requirements are cited in Section IV. Section VII is a cross-reference between the limits and monitoring requirements.

Complex Applicability Determinations

The turbines are not subject to 40 CFR 63, Subpart YYYY, Stationary Combustion Turbines, because the facility is not a major source of hazardous air pollutants.

S1, S2, S3, S4, S5 and S6 Turbines

The turbines are not subject to the Acid Rain program contained in 40 CFR Parts 72 through 78 because they are simple combustion turbines that commenced commercial operation before November 15, 1990, and are thus exempted by 40 CFR 72.6(1).

The turbines are subject to 40 CFR 68, Compliance Assurance Monitoring, because the turbines have a potential to emit more than 100 tons NOx per year before control by water injection and

water injection is considered a control method by the regulation. The compliance assurance-monitoring plan is contained in BAAQMD Condition #2571.

Since the NOx emissions after control are less than 100 tons per year, the frequency of monitoring will continue to be daily in accordance with 40 CFR 64.3(b)(4)(iii).

S9, Wipe Cleaning Operation
The compliance assurance-monitoring plan is contained in BAAQMD Condition #5974.

Changes to permit:
Section IV has been modified to state that SIP standards are now found on EPA's website and are not included as part of the permit.

The dates of adoption or approval of the rules and their "federal enforceability" status have been updated.

S1, S2, S3, S4, S5 and S6 Turbines:
New requirements for parametric monitoring in BAAQMD and SIP Regulation 1 have been added because the facility monitors the ratio of water to fuel on a daily basis.

S9, Wipe Cleaning Operation:
Regulation 8, Rule 4, requirements have been deleted from Table IV-B as these do not apply to S9. Wipe Cleaning Operation is subject to District Regulation 8-16, Solvent Cleaning Operations.

S20, Emergency Standby Diesel Engine:
A new table IV-C has been added that lists all requirements applicable to S20.

V. Schedule of Compliance

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

"409.10 A schedule of compliance containing the following elements:

10.1 A statement that the facility shall continue to comply with all applicable requirements with which it is currently in compliance;

10.2 A statement that the facility shall meet all applicable requirements on a timely basis as requirements become effective during the permit term; and

10.3 If the facility is out of compliance with an applicable requirement at the time of issuance, revision, or reopening, the schedule of compliance shall contain a plan by which the facility will achieve compliance. The plan shall contain deadlines for each item in the plan. The schedule of compliance shall also contain a requirement for submission of progress reports by the facility at least every six months. The progress reports shall contain the dates by which each item in the plan was achieved and an explanation of why any dates in the schedule of compliance were not or will not be met, and any preventive or corrective measures adopted."

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

The BAAQMD Compliance and Enforcement Division has conducted a review of compliance over the past year and has no records of compliance problems at this facility during the past year. The compliance report is contained in Appendix D of this permit evaluation and statement of basis.

Changes to permit:
The phrase "on a timely basis" has been added to the Schedule of Compliance.

VI. Permit Conditions

The existing permit conditions are derived from previously issued District Authorities to Construct (A/C) or Permits to Operate (P/O). Permit conditions may also be imposed or revised as part of the annual review of the facility by the District pursuant to California Health and Safety Code (H&SC) § 42301(e), through a variance pursuant to H&SC § 42350 et seq., an order of abatement pursuant to H&SC § 42450 et seq., or as an administrative revision initiated by District staff. After issuance of the Title V permit, permit conditions will be revised using the procedures in Regulation 2, Rule 6, Major Facility Review. Permit conditions may also be derived from periodic monitoring requirements pursuant to BAAQMD Regulation 2-5-503, Monitoring.

Each permit condition is identified with a unique numerical identifier, up to five digits. Each part of the condition is also identified by a part number and each subpart is identified by a letter (for example, Condition 789, part 1a).

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

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

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

Revisions to permit conditions:
Condition 2571

- In part 3b, 3-hr average has been removed because there is no averaging period in Regulation 9-9-302 or the Manual of Procedures. The averaging period is based on the method used to determine compliance and different methods have different test times. The EPA reference method, for example, is a series of grab samples that take about 3 seconds each. The BAAQMD method is the average of 3 one-half hour runs that can be conducted hours apart or within minutes of each other.
- Part 6 of BAAQMD Condition 2571 was changed administratively in 2001 to place the 5,000-hour limitation on a calendar year, rather than on a 12-month rolling basis. After this modification was made, the "5,000-hour clock" began at zero on January 1, 2001, and allowed Duke to resume operation of the six turbines, thereby providing badly-needed electricity to the State's power grid, as requested by the ISO.
- Part 9 of BAAQMD Condition 2571 was updated to ensure all fuel oil shipments to the facility either have vendor certification or laboratory analysis of the sulfur and nitrogen content of the fuel.
- Parts 13-16 have been added to include Compliance Assurance Monitoring (CAM) requirements, as follows:

    13. The owner/operator shall record the water-to-fuel ratio during operation on at least a daily basis. (basis: District Regulation 2-6-503, 40 CFR 64)

    14. The water and fuel meters shall be accurate to within plus or minus 5 percent. (basis: 40 CFR 64)

    15. The water and fuel meters shall be calibrated every two years using the meter manufacturer's specifications for calibration. (basis: 40 CFR 64)

    16. The owner/operator shall conduct source testing in accordance with the District's Manual of Procedures to confirm compliance at the water-to-fuel ratio of 60% to 90% on a volume basis and at the current fuel nitrogen content. The owner/operator shall conduct the testing within the first 877 hours of operation after issuance of the renewal permit or two years after issuance of the renewal permit, whichever is earlier. The owner/operator shall submit a testing protocol to the Manager of the District's Source Test Section at least seven (7) days prior to the test for review. The owner/operator shall notify the Manager of the District's Source Test Section at least seven (7) days prior to the test, to provide the District staff the option of observing the testing. Within 45 days of test completion, a comprehensive report of the test results shall be submitted to the Manager of the District's Source Test Section for review and disposition. The test shall be used to verify compliance with the CARB's diesel fuel nitrogen content limit of 500 ppmw. If a turbine has not operated during the permit term, testing is not required. (basis: Regulations 2-1-403, 2-6-503)

Similar CAM plans were approved for PG&E (A0024) and Mirant (A0026) for identical turbines.

During the public comment period for PG&E, EPA Region 9 commented that in other jurisdictions, 40 CFR 64, Compliance Assurance Monitoring, had been imposed on turbines using water injection to comply with federally-enforceable NOx limits. The District examined the issue and determined that the potential to emit for NOx before control was 139.5 tons per year for each turbine based on the following assumptions:

- 0.88 lb NOx/MMbtu
- 877 hours/yr (limit in BAAQMD Regulation 9-9-302)
- 2,600 gal fuel oil/hr
- 137,000 btu/gal fuel oil

Water injection is defined as a control device in 40 CFR 64.2. Based on the definition and the pre-control emissions, the District has concluded that the S1-S6, Turbines, are subject to this requirement.

BAAQMD Condition 2571 has been amended to include the CAM plan required by 40 CFR 64. Following are the elements of the proposed plan:

- Minimum water to fuel ratio of 60% to 90% (volume basis) during all periods of operation
- Accuracy of water and fuel meters of plus or minus 5 percent
- Calibration of meters every two years
- Daily record of water to fuel ratio
- Monitoring for sulfur and nitrogen content of every batch delivery of fuel
- Recordkeeping for hours of operation for each turbine

This proposal is based on the example in the EPA document entitled “Draft Supplement to Compliance Assurance Monitoring Tech. Guidance Document. 12 New Case Studies.” It differs in that recordkeeping will be on a daily basis, not hourly, and that the flow meters will be calibrated every two years, not every year. The District finds this plan approvable because the more rigorous plan is based on a 150-MW turbine with no limit on hours of operation, whereas this facility has six 25-MW turbines that are limited to 877 hours of operation per calendar year.

Monitoring of water injection to determine compliance with the NOx is proper because the water injection reduces NOx by 70 to 90 percent and is the method used to comply with the 65 ppmv NOx limit in BAAQMD Regulation 9-9-302. The facility has submitted results of test at one of their six turbines that show that the water injection rate is sufficient to meet the limit.

Since the tests submitted do not show a high margin of compliance, a requirement for source testing pursuant to 40 CFR 64.6(b) will be added. Source testing shall be performed within the first 877 hours of operation after issuance of the renewal permit or two years after issuance of the renewal permit, whichever is earlier. The reason for this extended schedule is that the turbines typically run only about 100 hours per year when required by the California Independent System Operator, so source testing may be difficult to schedule.

Duke Energy concurred with the Compliance Assurance Monitoring requirements listed above.

Condition 22183

- New Condition 22183 has been added for S20, Emergency Standby Diesel Engine. Condition includes hours of operation per Regulation 9-8330 and sulfur limit and monitoring requirements per Regulations 9-1-304 and 2-6-501.

VII. Applicable Limits and Compliance Monitoring Requirements

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

The District has reviewed all monitoring and has determined the existing monitoring is adequate with the following exception. Sources S1- S6, Turbines, are subject to 40 CFR 68, Compliance Assurance Monitoring, because the NOx emissions at each turbine would exceed 100 tons per year without control, the turbines are subject to a federally enforceable NOx limit, and NOx emissions are controlled by water injection.

The District has examined the monitoring for other limits and has determined that monitoring is adequate to provide a reasonable assurance of compliance. Calculations for potential to emit will be provided in the discussion when no monitoring is proposed due to the size of a source.

Monitoring decisions are typically the result of a balancing of several different factors including: 1) the likelihood of a violation given the characteristics of normal operation, 2) degree of variability in the operation and in the control device, if there is one, 3) the potential severity of impact of an undetected violation, 4) the technical feasibility and probative value of indicator monitoring, 5) the economic feasibility of indicator monitoring, and 6) whether there is some other factor, such as a different regulatory restriction applicable to the same operation, that also provides some assurance of compliance with the limit in question.

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

PM Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S1-S6, Turbines	BAAQMD Regulation 6-301	Ringelmann 1.0 for less than 3 min/hr	Visible emissions monitoring on every turbine for every 400 hours of operation
S1-S6, Turbines	BAAQMD Regulation 6-310	0.15 gr/dscf	None
S-20 Emergency Standby Diesel Engine	BAAQMD 6-303	Ringelmann 2.0	None
S-20 Emergency Standby Diesel Engine	BAAQMD 6-310	0.15 gr/dscf	None

PM Discussion:

BAAQMD Regulation 6 "Particulate Matter and Visible Emissions"

Visible Emissions

Visible emissions monitoring for every 400 hours of operation was imposed on S1-S6, Turbines, when the Title V permit was issued in 2000. This monitoring continues to be the most rigorous visible emissions monitoring imposed on a source of this size for opacity. The potential to emit for PM for each turbine, using AP-42 factors, is:

(0.012 lb PM/MMbtu) x (2600 gallons fuel oil/hr) x (139,000 btu/gallon) x (877 hr/yr) = 3803 lb PM10/yr = 1.9 tons/yr

Particulate Weight Limitation

BAAQMD Regulation 6-310 limits filterable particulate (FP) emissions from any source to 0.15 grains per dry standard cubic foot (gr/dscf) of exhaust volume. Section 310.3 limits filterable particulate emissions from "heat transfer operations" to 0.15 gr/dscf @ 6% O_2. These are the "grain loading" standards.

S1-S6, Turbines

S1-S6, Turbines, are subject to BAAQMD Regulation 6-310, 0.15 gr PM /dscf. No monitoring has been imposed because the margin of compliance is high, as shown by the following calculations.

Using the AP-42 emission factor and diesel oil data, and a typical diesel oil flue gas production rate of 9190 dscf/MMbtu at 0% oxygen, the particulate grain loading in each turbine's exhaust is expected to be less than 0.01 grains/dscf at 15% oxygen.

(0.012 lb PM/MMbtu) x (7000 gr/lb) / (9190 dscf/MMbtu) = 0.009 gr/dscf

The ratio of the limit to the calculated grain loading is 16:1; therefore, no additional monitoring is necessary to assure compliance.

S20, Emergency Standby Diesel Engine

S20, Emergency Standby Diesel Engine is subject to BAAQMD Regulations 6-303, Ringelmann 2.0 limitation and 6-310, 0.15 gr PM/dscf. No monitoring has been imposed because this engine will be used only in case of emergency-related activities like loss of regular electric power supply, fire and during maintenance of a primary motor.

SO_2 Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S1-S6, Turbines	BAAQMD 9-1-301	Ground level concentrations of SO2 shall not exceed: 0.5 ppm for 3 consecutive minutes AND 0.25 ppm averaged over 60 consecutive minutes AND 0.05 ppm averaged over 24 hours	None
S1-S6, Turbines	BAAQMD 9-1-304	Sulfur content of fuel < 0.5% by weight	Fuel certification
S20, Emergency Standby Diesel Engine	BAAQMD 9-1-301	Ground Level SO_2 Limits: $\leq$ 0.5 ppm for 3 minutes and $\leq$ 0.25 ppm for 60 min. and $\leq$ 0.05 ppm for 24 hours	None
S-20, Emergency Standby Diesel Engine	BAAQMD 9-1-304	Fuel Sulfur Content Limit: $\leq$ 0.5% sulfur by weight	Fuel Certification Records

SO2 Discussion:

BAAQMD Regulation 9-1-301

Area monitoring to demonstrate compliance with the ground level SO2 concentration requirements of Regulation 9-1-301 is at the discretion of the APCO (per BAAQMD Regulation 9-1-501). This facility does not have equipment that emits large amounts of SO2 and therefore is not required to have ground level monitoring by the APCO.

S1-S6, Turbines, and S-20, Emergency Standby Diesel Engine, are subject to BAAQMD Regulation 9-1-304, a limit of no more than 0.5% sulfur in liquid fuels, because they burn fuel oil. The standard monitoring, fuel certification, has been imposed on these sources.

Lead Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S1-S6, Turbines	BAAQMD 11-1-301	6.75 kg/day	None
S1-S6, Turbines	BAAQMD 11-1-302	1.0 ug/m3 averaged over 24 hours	None

Following are detailed citations of the lead standards:

11-1-301 **Daily Limitation:** A person shall not discharge any emission of lead, or compound of lead calculated as lead, from any emission point in excess of 6.75 kg (15 lbs) per day.

11-1-302 **Ground Level Concentration Limit Without Background:** A person shall not discharge any emission of lead, or compound of lead calculated as lead, that will result in ground level concentrations in excess of 1.0 ug/m^3 averaged over 24 hours.

These limits shall be compared with the potential to emit for lead from each emission point.

Compliance with 11-1-301

The AP-42 emission factor for lead from fuel oil combustion at S1-S6, Turbines, is 1.4×10^{-5} lb/MMbtu. Each turbine can burn 2600 gal fuel oil/hr or 62,400 gal fuel oil/day, which is equivalent to 8,674 MMbtu/day. The maximum amount of lead that could be emitted per turbine is 0.12 lb/day or 0.05 kg/day.

Since the potential to emit in this case is at least 125 times lower than the limit, no additional monitoring is required.

Compliance with 11-1-302

The maximum lead emission levels above and the dispersion calculations prescribed in BAAQMD Regulation 11-1-601 were used to determine compliance with 11-1-302. The maximum 24-hr average ground level lead concentration caused by the facility at maximum operation is expected to be about 0.11 micrograms/cubic meter, which is in compliance with the

1.0 micrograms/cubic meter limit. The calculations are attached in Appendix A and form part of this Statement of Basis. These calculations are based on fuel oil combustion at the turbines.

POC Sources

POC Discussion: POC limits for S20, Wipe Cleaning Operation are contained in permit conditions, which also contain adequate monitoring- daily records, and quarterly summations.

Following is a list of revisions to Section VII:

- The language at the beginning of the section has been made clearer.
- The headings at the top of the table have been changed. The first "Emission Limit" column has been changed to "Citation of Limit" since not every limit is an emission limit. The second "Emission Limit" column has been changed to "Limit" since not every limit is an emission limit and the column actually contains a short summary of the limit.
- The “type of limit” has been changed to “opacity” for Regulation 6-301.
- The “type of limit” has been changed to “FP” or “filterable particulate” for Regulation 6-310. Filterable particulate is defined as “particulate as measured by BAAQMD Method ST-15, Particulate.” This is the type of particulate that is regulated by Regulation 6-310.
- Table VII-C has been added to include S20, Emergency Standby Diesel Engine.

S1-S6, Turbines

- The description of the limit for BAAQMD 6-301 has been expanded from "Ringelmann No. 1" to "Ringelmann No. 1 for no more than 3 min/hr", which is more complete.
- The averaging period for the limit in Regulation 9-9-302 has been removed because there is no averaging period in the rule or the Manual of Procedures. The averaging period is based on the method used to determine compliance and different methods have different test times. The EPA reference method, for example, is a series of grab samples that take about 3 seconds each. The BAAQMD method is the average of 3 one-half hour runs that can be conducted hours apart or within minutes of each other.
- The citation of the limit for NOx has been corrected from "BAAQMD condition #2571, part 1a" to "BAAQMD condition #2571, part 3a."
- The citation of the limit for NOx has been corrected from “BAAQMD condition #2571, part 1b” to “BAAQMD condition #2571, part 3b.”

VIII. Test Methods

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

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

Changes to permit

EPA Reference Method 5 (40 CFR 60, Appendix A), Determination of Particulate Emissions from Stationary Sources, has been added as an alternative method for BAAQMD Regulation

6-310.

IX. Permit Shield

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

The second type of permit shield is allowed by EPA's White Paper 2 for Improved Implementation of the Part 70 Operating Permits Program. The District uses the second type of permit shield for all streamlining of monitoring, recordkeeping, and reporting requirements in Major Facility Review permits. The District's program does not allow other types of streamlining in Major Facility Review permits.

This facility has no permit shields.

X. Revision History

New section has been added to the Title V permit.

XI. Glossary

Additions and corrections have been made to the glossary.

XII. Applicable State Implementation Plan

The applicable regulations and rules from the State Implementation Plan are no longer attached to the permit. This section now states that the regulations and rules are available on EPA Region IX's website.

D. Alternate Operating Scenarios:

No alternate operating scenario has been requested for this facility.

E. Compliance Status:

An April 26, 2005, office memorandum from the Director of Compliance and Enforcement, to the Director of Engineering, presents a review of the compliance record of the facility, which is attached in Appendix D. The Compliance and Enforcement Division staff has reviewed the records for the period from March 1, 2004 through February 28, 2005. This review was initiated as part of the District evaluation of the application for a Title V permit renewal. During the period subject to review, activities known to the District include:

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

In addition, staff reviewed the Duke Energy Oakland LLC annual Compliance Certifications for 2000-2005 and found no outstanding compliance issues.

The owner certified that all equipment was operating in compliance on August 26, 2004.

APPENDIX A

DISPERSION CALCULATIONS FOR LEAD

Regulation 11-1-302 states that a person shall not discharge any emission of lead, or compound of lead, that will result in ground level concentrations in excess of 1.0 $\mu g/m^3$, averaged over 24 hours.

Regulation 11-1-601 states that ground level emissions limited by Section 11-1-302 shall be determined by use of dispersion calculations described in the Manual of Procedures, Volume VI, Section 2.

Based on the potential to emit calculations provided, the analysis (see Appendix 1) shows that the maximum 24-hr average ground level lead concentration caused by Duke Energy is expected to be about 0.11 $\mu g/m^3$. Therefore, it is shown that Duke Energy complies with Regulation 11-1-302.

APPENDIX 1

CALCULATION OF GROUND LEVEL LEAD CONCENTRATION

Duke Energy Oakland LLC, Plant 11887

Methodology

According to the Manual of Procedures, Volume VI, Section 2.:

> *"Emission limitations required to meet Regulation 11-1-302 shall be determined by use of formulas 4.1 and 5.13, and figures 3-3 and 3-9, in "Workbook of Atmospheric Dispersion Estimates," by D. Bruce Turner, Public Health Service Publication No. 999-AP-26, Revised 1969, published by the U.S. Department of Health, Education and Welfare. In using said equations and figures, a neutral or "D" stability category shall be assumed, a wind shall be assumed that remains throughout the averaging period directed within a 22.5 ^{o} sector of the compass rose at an average speed of two meters per second, and an ambient air temperature of 293 K shall be assumed.*

Calculations

1. Stack parameters:

	S1	S2	S3	S4	S5	S6
V_S	16.9 m/s	16.9 m/s	16.9 m/s	16.9 m/s	16.9 m/s	16.9 m/s
T_S	722 K	722 K	722 K	722 K	722 K	722 K
d	3.9 m	3.9 m	3.9 m	3.9 m	3.9 m	3.9 m
H_S	20.9 m	20.9 m	20.9 m	20.9 m	20.9 m	20.9 m

2. Calculate plume rise using formula 4.1 (Holland's Equation) in Turner's workbook.

$\delta H = (V_S\ d/u)(1.5 + (2.68\ E\text{-}3)(p\ d)((T_S - T_A)/T_S))$

using

u = 2 m/s
T_a = 293 K
p = 1013 mb

	S1	S2	S3	S4	S5	S6
δH	235 m	235 m	235 m	235 m	235 m	235 m

3. Determine X_{MAX} from Figure 3-9 in Turner's Workbook.

H = Effective height of emission

$H = H_S + \delta H$

	S1	S2	S3	S4	S5	S6
H	256 m	256 m	256 m	256 m	256 m	256 m

From Fig. 3-9, assuming "D" stability as specific in the MOP and H from above:

	S1	S2	S3	S4	S5	S6
X_{MAX}	14 km	14 km	14 km	14 km	14 km	14 km

4. Determine Vertical Dispersion Coefficient (σ_z) from Figure 3-3 in Turner's workbook.

From Fig. 3-3, assuming "D" stability and X_{MAX} from above:

	S1	S2	S3	S4	S5	S6
σ_z	160 M	160 M	160 m	160 m	160 m	160 m

5. Calculate maximum annual average (X_{AN}) and 24-hour average (X_{24}) concentrations using Formula 5.13 in Turner's Workbook:

$X_{AN} = (2.03\ Q)(\exp[\ -0.5\ (H/\sigma_z)^2\ ])/(\ \sigma_z\ u\ X_{MAX})$

Using Q = 2.9 E-3 g/sec lead [from Title V potential to emit calculation]

X_{AN} = g/m^3, maximum annual average

$X_{24} = 4\ X_{AN} =$ g/m^3, maximum 24-hr average

	S1	S2	S3	S4	S5	S6	Maximum Total
Q	2.9 E-3 g/s	2.9 E-3 g/s	2.9 E-3 g/s	2.9 E-3 g/s	2.9 E-3 g/s	2.9 E-3 g/s	
X_{AN}	4.7 E-3 ug/m^3	4.7 E-3 ug/m^3	4.7 E-3 ug/m^3	4.7 E-3 ug/m^3	4.7 E-3 ug/m^3	4.7 E-3 ug/m^3	

X_{24}	0.0188 ug/m^3	0.0188 ug/m^3	0.0188 ug/m^3	0.0188 ug/m^3	0.0188 ug/m^3	0.0188 ug/m^3	0.11 ug/m^3

APPENDIX B

GLOSSARY

ACT
Federal Clean Air Act

APCO
Air Pollution Control Officer

AP-42
EPA's Compilation of Air Pollutant Emission Factors

ARB
Air Resources Board

BAAQMD
Bay Area Air Quality Management District

BACT
Best Available Control Technology

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

CAA
The federal Clean Air Act

CAAQS
California Ambient Air Quality Standards

CAPCOA
California Air Pollution Control Officers Association

CEQA
California Environmental Quality Act

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

CO
Carbon Monoxide

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

District
The Bay Area Air Quality Management District

dscf

Dry Standard Cubic Feet

EPA
The federal Environmental Protection Agency.

Excluded
Not subject to any District regulations.

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

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

Grains
1/7000 of a pound

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

IERC
Interchangeable Emission Reduction Credit, as defined by BAAQMD Regulation 2-9-212.

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

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

MOP
The District's Manual of Procedures.

NAAQS
National Ambient Air Quality Standards

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

NMHC
Non-methane Hydrocarbons (Same as NMOC)

NMOC

Non-methane Organic Compounds (Same as NMHC)

NOx
Oxides of nitrogen.

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

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

Offset Requirement
A New Source Review requirement to provide federally enforceable emission offsets at a specified ratio for the emissions from a new or modified source and any pre-existing cumulative increase minus any onsite contemporaneous emission reduction credits. Applies to emissions of POC, NOx, PM10, and SO2.

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

POC
Precursor Organic Compounds

PM
Particulate Matter

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

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

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

SO2
Sulfur dioxide

THC
Total Hydrocarbons (NMHC + Methane)

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

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

TPH
Total Petroleum Hydrocarbons

TRMP
Toxic Risk Management Plan

TSP
Total Suspended Particulate

VOC
Volatile Organic Compounds

Units of Measure:

bhp	=	brake-horsepower
btu	=	British Thermal Unit
cfm	=	cubic feet per minute
F =		degrees Fahrenheit
g	=	grams
gal	=	gallon
gpm	=	gallons per minute
hp	=	horsepower
hr	=	hour
lb	=	pound
in	=	inches
max	=	maximum
m^2	=	square meter
min	=	minute
ug	=	micro-gram, one millionth of a gram
mm	=	million
MMbtu	=	million btu
MMcf	=	million cubic feet
ppmv	=	parts per million, by volume
ppmw	=	parts per million, by weight
psia	=	pounds per square inch, absolute
psig	=	pounds per square inch, gauge
scfm	=	standard cubic feet per minute
yr	=	year

Symbols:

<	=	less than
>	=	greater than
≤	=	less than or equal to
≥	=	greater than or equal to

APPENDIX C

Application 6385

ENGINEERING EVALUATION
Duke Energy; SITE 11887
APPLICATION 6385

BACKGROUND

Duke Energy has applied for a permit to operate an existing standby generator powered by a diesel engine S-20. The engine has been in operation since 1998 and was thus installed before May 17, 2000 when Regulation 1 and Regulation 2-1 were modified to require engines greater than 50 HP to require a Permit to Operate. As such, S-20 constitutes a Loss-Of-Exemption source not subject to Regulations 2-1-301 or 2-1-302 ("new" and "modified sources").

S-20 Emergency Standby Generator: Diesel Engine, Make, Deutz, Model: F4L912, Horsepower Rating: 69.5 HP.

Pursuant to division policy, S-20 is unlimited in the amount of hours per year it may operate since S-20 was installed before May 17, 2000 and is less than 250 HP.

EMISSIONS

Emissions from S-20 do not need to be calculated since S-20 is not defined as a new or modified source.

CUMULATIVE INCREASE

Emissions from S-20 do not count towards the facility's cumulative increase since S-20 is not defined as a new or modified source pursuant to Regulation 2-1.

BACT

Since S-20 is a loss-of-exemption source, it is not subject to BACT requirements pursuant to Regulation 2-2.

OFFSETS

Offsets are not required because S-20 is not a new or modified source pursuant to Regulation 2-1 and 2-2.

TOXIC RISK SCREEN ANALYSIS

A Toxic Risk Screen Analysis is not required for this source since S-20 is not a new or modified source and not subject to Regulation 2-1-316.

STATEMENT OF COMPLIANCE

S-20 is a loss-of-exemption standby generator installed before May 17, 2000 and therefore not subject to Regulations 9-8-301, 9-8-302, and 9-8-502. S-20 is subject to the monitoring and record keeping procedures described in Regulation 9-8-530, the SO_2 limitations of Regulation 9-1-302 (ground level concentration) and 9-1-304 (0.5% by weight in fuel), and the Ringelmann No. 2 limitations of Regulation 6-303(emissions opacity limitations). Requirements for Regulation 9-8-530 are included in the proposed permit conditions. Compliance with Regulation 9-1-304 is likely since California law mandates using diesel fuel with a 0.05% by weight sulfur.

Per Regulation 6, Section 303, a person shall not emit for a period or periods aggregating more than three minutes in any hour, a visible emission that is as dark or darker than No. 2 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to an equivalent or greater degree, nor shall said emission, as

perceived by an opacity sensing device in good working order, where such device is required by District regulations, be equal to or greater than 40% opacity.

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

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

A toxic risk screening analysis is not required.

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

PERMIT CONDITIONS

Application 6385; Duke Energy; Plant 11887; Conditions For S-20: None

RECOMMENDATION

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

S-20 Emergency Standby Generator: Diesel Engine, Make, Deutz, Model: F4L912, Horsepower Rating: 69.5 HP.

BY: _____ _____

JDI:jdi **Duncan Innes** **Date**
6385E.doc **Air Quality Technician**

APPENDIX D

Compliance Report