COMMONWEALTH *of* VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

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COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Northern Virginia Regional Office

STATEMENT OF LEGAL AND FACTUAL BASIS

Washington Gas Springfield Operations Center
Springfield, Virginia
Permit No. NVRO70151

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, Washington Gas has applied for a Title V Operating Permit for its Springfield Operations Center (Cogeneration Plant). The Department has reviewed the application and has prepared a Title V Operating Permit.

Engineer/Permit Contact: _____ Date: November 19, 2001
Christopher D. Meoli
(703) 583-3842

Air Permit Manager: _____ Date: November 19, 2001
Terry Darton

Regional Permit Manager: _____ Date: November 19, 2001
Charles D. Forbes.

FACILITY INFORMATION

Permittee
Washington Gas
6801 Industrial Road
Springfield, VA. 22151

Facility
Springfield Operations Center
6801 Industrial Road
Springfield, VA. 22151

AIRS ID No. 51-059-0056

SOURCE DESCRIPTION

SIC Code: 4924 – Natural Gas Distribution

All electricity, space and water heating, and air conditioning used at the Springfield Operations Center is produced at a Cogeneration Plant located on site. The Cogeneration Plant consists of six Caterpillar generators, each driven by a natural gas-fired engine rated at a nameplate capacity of 930 horsepower (857 hp de-rated), and three natural gas-fired Cleaver Brooks heat recovery boilers, each rated at 10.46 million BTU per hour. The units are configured such that two generators are linked to one boiler resulting in three sets of two generators and one boiler. The exhaust gases from each set of two generators are sent to a single boiler for recovery of heat and eventual exit through a single boiler stack. Each generator exhaust column is equipped with a Johnson Matthey Catalytic Converter to control oxides of nitrogen. Auxiliary equipment consists of a natural gas-fired Hitachi Chiller, rated at 9.6 million BTU per hour, a diesel-fired Cummins Emergency Generator rated at 268 horsepower and a diesel-fired Volvo Emergency Generator rated 749 horsepower.

The facility is a Title V major source of nitrogen oxides (NO_x) and carbon monoxide (CO), and is a PSD major source for CO. This source is located in a Fairfax County Virginia, which is part of the Northern Virginia Ozone Nonattainment Area, and is classified as Serious nonattainment for ozone. As a result, the source is a nonattainment major source for NO_x. The county and region is in attainment with the National Ambient Air Quality Standards (NAAQS) for all other criteria pollutants. The source has never been issued a new source review permit but is currently operating under the authority of two Consent Agreements, dated and signed by DEQ on April 3, 1998. The Consent Agreements establish Reasonably Available Control Technology (RACT) for NO_x and have been approved by the Environmental Protection Agency (EPA) and incorporated into Virginia's State Implementation Plan (SIP) .

COMPLIANCE STATUS

The facility is inspected once per year by the Virginia DEQ. The last inspection was conducted on July 12, 2001. The facility was determined to be in compliance with RACT and all other requirements.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

The emissions units at this facility consist of the following:

Table 1. Significant Emission Units at Springfield Operations Center

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
Fuel Burning Equipment							
01	01	Caterpillar Generator No. 1, Model G399 engine, natural gas-fired (began operation in 1969)	930 horsepower	Johnson Matthey Catalytic Converter on Emission Unit 01 exhaust	011	NO_x	NO_x RACT Consent Agreement dated April 3, 1998
02	01	Caterpillar Generator No. 2, Model G399 engine, natural gas-fired (began operation in 1969)	930 horsepower	Johnson Matthey Catalytic Converter on Emission Unit 02 exhaust	012	NO_x	NO_x RACT Consent Agreement dated April 3, 1998
03	01	Cleaver Brooks Boiler No. 1, natural gas-fired (began operation in 1969)	10.46 MMBtu/hr	---	---	---	None
04	02	Caterpillar Generator No. 3, Model G399 engine, natural gas-fired (began operation in 1969)	930 horsepower	Johnson Matthey Catalytic Converter on Emission Unit 04 exhaust	013	NO_x	NO_x RACT Consent Agreement dated April 3, 1998
05	02	Caterpillar Generator No. 4, Model G399 engine, natural gas-fired (began operation in 1969)	930 horsepower	Johnson Matthey Catalytic Converter on Emission Unit 05 exhaust	014	NO_x	NO_x RACT Consent Agreement dated April 3, 1998

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
06	02	Cleaver Brooks Boiler No. 2, natural gas-fired (began operation in 1969)	10.46 MMBtu/hr	---	---	---	None
07	03	Caterpillar Generator No. 5, Model G399 engine, natural gas-fired (began operation in 1969)	930 horsepower	Johnson Matthey Catalytic Converter on Emission Unit 07 exhaust	015	NO_x	NO_x RACT Consent Agreement dated April 3, 1998
08	03	Caterpillar Generator No. 6, Model G399 engine, natural gas-fired (began operation in 1969)	930 horsepower	Johnson Matthey Catalytic Converter on Emission Unit 07 exhaust	016	NO_x	NO_x RACT Consent Agreement dated April 3, 1998
09	03	Cleaver Brooks Boiler No. 2, natural gas-fired (began operation in 1969)	10.46 MMBtu/hr	---	---	---	None

EMISSIONS INVENTORY

A copy of the 2000 annual emission statement is enclosed as Attachment A. Emissions from the Emission Units presented in Table 1 and the Insignificant Emission Units presented in Table 3 are summarized in the following tables.

Table 2. 2000 Actual Criteria Pollutant Emissions

Emission Unit	2000 Criteria Pollutant Emissions (tpy)				
	VOC	CO[1]	SO_2	PM_{10}	NO_x
01	0.93	37.0	---	0.87	10.91
02	0.76	30.4	---	0.72	8.99
03	---	0.01	---	0.0	0.04
04	0.84	33.7	---	0.79	9.91
05	0.79	31.6	---	0.75	9.32
06	---	0.01	---	0.0	0.04
07	0.64	25.5	---	0.56	7.52
08	0.98	39.2	---	0.93	11.6
09	---	0.01	---	0.0	0.04
All others	0.08	0.38	0.04	0.07	1.5
Total	5.02	197.8	0.04	4.73	59.9

[1]: CO emissions are not required to be reported in annual Emission Statements. As a result, annual CO emissions were calculated by DEQ using appropriate emission factors obtained from the application and operational data provided in the annual Emission Statement.

Emission statements only require the estimates of actual hazardous air pollutants (HAPs) which are non-VOC and non-PM based. There were no HAPs of this kind emitted in reportable quantities at the Springfield Operations Center in 2000. Actual HAP emissions of all kinds emitted from significant Emission Units totaled less than 150 pounds in 2000. Due to this low level of emissions, no additional emissions information on HAPs is provided.

EMISSION UNIT APPLICABLE REQUIREMENTS – Internal Combustion Engines (Emission Units 01, 02, 04, 05, 07, and 08)

This section identifies requirements established in two Consent Agreements developed to implement NO_x RACT. Copies of the Consent Agreements are enclosed in Appendix B. These requirements are part of a case-by-case NO_x RACT, which was approved by EPA and incorporated into Virginia's SIP. These requirements are currently State-only enforceable, but will become federally enforceable upon EPA's approval of the RACT into the SIP.

Limitations

- NO_x RACT limit of 2.0 grams per horsepower hour per engine, established in Condition E.2 of the April 3, 1998 Consent Agreement (NVRO-031-98) between DEQ and Washington Gas.

- 9 VAC 5-40-80 of the Virginia Administrative Codes establishes a visible emissions limit of . 20% opacity at all times except for any six-minute period in any one-hour not to exceed 60% opacity. However, this applicable requirement is contained within IV.A.3 since the exhaust from the internal combustion engines is piped directly to the boilers (Emission Units 03, 06 and 09) for heat recovery. The combined exhaust from the internal combustion engines and boilers exit through the boiler stacks (Stack ID 01, 02 and 03).

Monitoring

Conditions III.B.1 through III.B.4 of the permit establish a periodic monitoring plan to provide a reasonable assurance of continuous compliance with the NO_x limit of 2.0 g/hp-hr contained in Condition III.A.1. These conditions are based on a parametric monitoring plan completed by Washington Gas as part of compliance with Condition E.4 of the Consent Agreements. This plan was approved by DEQ on June 11, 1999, and modified to meet the periodic monitoring requirements of Part 70. The parametric monitoring plan is enclosed in Appendix C.

A parametric monitoring plan is a useful means of assessing ongoing compliance when a control device is used to meet compliance with a limit. This type of approach is valid when the initial performance test shows compliance by a wide margin and relevant surrogate parameters can be monitored during the test and over the life of the control device. The results of the initial compliance test showed that average NO_x emissions of 0.124 g/hp-hr were a fraction of the 2.0 g/hp-hr limit. The parametric monitoring plan developed for the Consent Agreements established differential temperature and pressure across the catalyst in combination with periodic NO_x analysis as the basis of the plan. In addition, the plan provides a means to assess the proper operation of the engines, as well as the catalyst, and provide corrective actions on the catalyst and/or the engines when problems occur.

A summary of the periodic monitoring approach for NO_x is as follows:

- Washington Gas developed curves of engine load versus differential pressure and temperature across the catalyst after completion of a successful initial compliance demonstration and during the catalyst's initial six months of operation. On a daily basis, operators will monitor both parameters and compare them to the curves. If monitored values are out of range (i.e., above the pressure curve or below the temperature curve), the source will take a step to first corroborate the initial exceedance, and the take a series of steps to identify and correct the problem.
- Every six months, Washington Gas will be required to determine NO_x emissions using a portable NO_x analyzer. The results will be used to determine compliance with the RACT limit and be used to verify the temperature and pressure versus engine load curves. Adjustments to the curves will be made as necessary.
- Once during the term of the permit, a minimum of two engines will be tested using a Reference Method test.
- In addition, a condition was added to require that the engines be operated and maintained properly, and that operators be trained in the proper operation of the engines. This also serves to satisfy adequate periodic monitoring for the visible emissions limit. An exceedance of the visible emissions standard is highly unlikely so long as pipeline grade natural gas is used and the engines are operated properly. This position is supported by the September 15, 1998 EPA memorandum from Eric Schaeffer and John Seitz, entitled "Periodic Monitoring Guidance for the Title V Operating Permits Program."

Record keeping

The permit includes requirements for maintaining records of all monitoring and testing required by the permit. These records include the following:

- Daily differential temperature and pressure measurements across the catalyst and engine load,
- Differential temperature and pressure measurements made during periods of corrective action,
- Original and adjusted curves of differential temperature and pressure versus engine load,
- NO_x emissions and related parameter measurements, made using the portable analyzer during the bi-annual testing and during periods of corrective actions,
- Natural gas consumption,
- Records of scheduled and unscheduled maintenance, and
- Records of operator training.

All records are required to kept on-site for inspection by DEQ and be current for the most recent 5 years. Operator training records shall be up to date for the current group of operators.

Testing

The permit requires the permittee to conduct and EPA reference method test, identified in the permit, to determine compliance with the NO_x limit once during the permit term. The testing is

required on a minimum of two of the six engines.

Reporting

The permit requires reporting of the following:

- Emission excursions,
- Compliance test results,
- Semi-annual reporting of daily differential temperature and pressure readings, data recorded during periods of corrective actions, and semi-annual NO_x results as required of all monitored parameters in the General Requirements section of the permit.

The permit establishes reporting schedules for all of the above items.

Streamlined Requirements

The majority of the requirements contained in the NO_x RACT Consent Agreements have been met or are continuously being met. As a result, most of the conditions of the Consent Agreements are irrelevant or obsolete and have not been included or referenced in the permit or addressed in this document. The exceptions are Condition E.2 and E.5 of NVRO-031-98, and Condition E.4 of both Consent Agreements. Condition E.2 contains the NO_x RACT emission limit and has not been streamlined. Condition E.4 required development of a parametric monitoring plan which has already been submitted and approved by DEQ. However, Condition E.4 is cited in this operating permit as the basis of the several monitoring provisions covering periodic monitoring of the NO_x limit. Condition E.5 has several applicable requirements which have been streamlined by the permit as follows:

- Condition E.5 of the NVRO-031-98 Consent Agreement requires Washington Gas to submit annual reports of RACT non-compliant activity. This condition is streamlined by Condition III.E.1 (specific to the engines) and General Condition VII.E of the permit, which requires emissions excursions and permit deviations to be reported.
- Condition E.5 of the Consent Agreement also requires that logs be kept of the daily differential temperature and pressure measurements. This is streamlined by Condition III.C.1 of the permit, which requires recording of daily differential temperature and pressure measurements.
- Additionally, Condition E.5 of the Consent Agreement requires an annual report demonstrating compliance with all RACT requirements. This reporting requirement has been streamlined as part of the annual compliance certification General Condition VII.D. Compliance with the conditions of the Title V permit ensure compliance with the RACT requirements in the Consent Agreement.
- Finally, Condition E.5 of the Consent Agreement requires that daily records be kept for the most recent five years and be made available for inspection. The record keeping provisions contained in Section III.C of the permit provide for this.

EMISSION UNIT APPLICABLE REQUIREMENTS – Boilers (Emission Units 03, 06, and 09)

Limitations

Emissions from the boilers are regulated by 9 VAC Chapter 40, Article 8 – Emission Standards for Fuel Burning Equipment. These regulations apply to existing fuel burning units and set emission limits for sulfur dioxide, particulate matter and visible emissions. These standards were calculated as follows:

Sulfur dioxide 9 VAC 5-40-930 A(2) applies to the fuel burning equipment installation as follows:

S = 1.06 k, where k is the total capacity of applicable fuel burning units
S = 1.06 (10.46 MMBtu/hr x 3 units) = 33.3 lb/hr

Particulate Matter: There are two separate emission limits for particulate matter.
9 VAC 5-40-900 A applies to the fuel burning equipment installation and is 0.3 lb/MMBtu.

9 VAC 5-40-900 B applies to each emission unit and is calculated as follows:
PM limit = 10.46 MMBtu/hr x 0.3 lb/MMBtu = 3.1 lb/hr.

Visible Emissions: 9 VAC 5-40-940 sets a visible emissions standard of 20 % opacity at all times except for any six-minute period in any one-hour not to exceed 60 % opacity. This visible emission limit also indirectly applies to the exhaust from the internal combustion engines (Emission Units 01, 01, 04, 05, 07 and 08). Their exhaust is piped directly to the boilers for heat recovery and the combined exhaust from the boilers and internal combustion engines exit through the boiler stacks (Stack ID 01, 02 and 03).

Monitoring and Record keeping

So long as the units are properly operated, maintained, and are fueled by pipeline natural gas, it is highly unlikely that the emission standards for sulfur dioxide, particulate matter, or visible emissions will be exceeded. This position is supported when calculating worst-case emissions based on the most up to date emission factors for natural gas combustion in external combustion sources as obtained from Chapter 1.4 of AP-42, 5th edition.

Proper operation and maintenance of the boilers, as required by Condition IV.B.1 of the permit, will ensure that these emission limits are not approached. This condition also requires the source to train the boiler operators in the proper operation and maintenance of the emissions units. Records of the training and all scheduled and unscheduled maintenance are required to be kept for all operators to ensure that the proper training has been conducted.

Testing

The permit does not require source emissions tests. A table of test methods has been included

in the permit if testing is performed. The DEQ and EPA have the authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Reporting

No specific reporting requirements have been included in this permit.

Streamlined Requirements

Streamlining of applicable requirements was not necessary.

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110, that apply to all Federal operating permit sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions, including those caused by upsets, within one business day.

Comments on General Conditions

B: Permit Expiration

This condition refers to the Board taking action on a permit application. The Board referred to is the State Air Pollution Control Board. The authority to take action on permit application(s) has been delegated to the Regions as allowed by § 2.1-20.01:2 and § 10.1-1185 of the *Code of Virginia,* and the "Department of Environmental Quality Agency Policy Statement NO. 3-2001".

This general conditions cites the entire Article(s) that follow:
B.2. Article 1 (9 VAC 5-80-50 et seq.), Part II of 9VAC 5 Chapter 80. Federal Permits for Stationary Sources
B.3. Article 1 (9 VAC 5-80-50 et seq.), Part II of 9 VAC 5 Chapter 80. Federal Permits for Stationary Sources

This general condition cites the sections that follow:

B.	9 VAC 5-80-80. "Application"
B.2.	9 VAC 5-80-150. "Action on Permit Applications"
B.3.	9 VAC 5-80-80. "Application"
B.4.	9 VAC 5-80-80. "Application"
B.4.	9 VAC 5-80-140. "Permit shield"
B.5.	9 VAC 5-80-80. "Application"

STATE ONLY APPLICABLE REQUIREMENTS

There are no State-only applicable requirements identified in this Section of the permit.

FUTURE APPLICABLE REQUIREMENTS

40 CFR Part 64, Compliance Assurance Monitoring (CAM), applies to pollutant-specific emission units with pre-control device emissions of regulated pollutants exceeding major source thresholds. The units must have control devices in place and have applicable requirement for the subject pollutant. The rule requires sources to monitor the operation and maintenance of the control devices to ensure compliance with applicable requirements. The internal combustion engines at Washington Gas have pre-control device emissions of NO_x of greater than 50 tons per year and are subject to a RACT standard. Therefore, CAM is applicable to the engine catalysts. However, the CAM rule defines the engines as "other pollutant-specific emission units" and submittal of a CAM plan is not required until permit renewal. Furthermore, it is possible and even likely that the current periodic monitoring plan will satisfy the requirements of a CAM plan. Therefore, 40 CFR Part 64 is not listed as an applicable requirement.

INAPPLICABLE REQUIREMENTS

The source did not identify any inapplicable requirements.

COMPLIANCE PLAN

The source is currently in compliance with all applicable requirements.

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, record keeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

Table 3. Insignificant emission units include the following:

Emission Unit No.	Emission Unit Description	Citation[1]	Pollutant(s) Emitted (9 VAC 5-80-720 B)	Rated Capacity (9 VAC 5-80-720 C)
10	Hitachi chiller	9 VAC 5-80-720C	PM/PM_{10}, SO_2, NO_x, CO, VOC	9.2 MMBtu/hr
12	Cummins diesel-fired emergency generator	9 VAC 5-80-720C	PM/PM_{10}, SO_2, NO_x, CO, VOC	268 horsepower
13	Miscellaneous natural gas-fired space heating units	9 VAC 5-80-720B	PM/PM_{10}, SO_2, NO_x, CO, VOC	Each less than 10.0 MMBtu/hr

14	Auto body paint spray booth	9 VAC 5-80-720B	VOC	---
15	Paint Spray Booth	9 VAC 5-80-720B	VOC	---
18	Volvo diesel-fired emergency generator	9 VAC 5-80-720C	PM/PM_{10}, SO_2, NO_x, CO, VOC	749 horsepower

[1] The citation criteria for insignificant activities are as follows:

9 VAC 5-80-720 A - Listed Insignificant Activity, Not Included in Permit Application
9 VAC 5-80-720 B - Insignificant due to emission levels
9 VAC 5-80-720 C - Insignificant due to size or production rate

CONFIDENTIAL INFORMATION

The source did not submit a request for confidentiality. All portions of the Title V application are suitable for public review.

PUBLIC PARTICIPATION

The proposed permit was placed on public notice in the Washington Times from August 13th, 2001 to September 12th, 2001.

APPENDIX A
2000 Emission Statement

DEQ

VIRGINIA DEPARTMENT OF
ENVIRONMENTAL QUALITY

RECEIVED
MAR 1 2001
Northern VA. Region
Dept. of Env. Quality

EMISSION STATEMENT CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering and evaluating the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

(see reverse side for instructions)

SIGNATURE: _____ **DATE:** March 1, 2001

PRINTED NAME: Thomas F. Fryer

TITLE: Area Head, Safety and Environment

COMPANY: Washington Gas Company

REGISTRATION NUMBER: 51-059-0056; 70151

TELEPHONE NUMBER:
(703) 750-5849

DEQ

VIRGINIA DEPARTMENT OF
ENVIRONMENTAL QUALITY

RECEIVED
MAR 1 2001
Northern VA. Region
Dept. of Env. Quality

2000 EMISSION STATEMENT

Please correct any errors in the information below (cross out & replace)

FACILITY NAME	REGISTRATION #	CONTACT PERSON
WASHINGTON GAS/ SPRINGFIELD OPER CTR	70151	MINTO, TANYA

LOCATION	JURISDICTION
6801 INDUSTRIAL ROAD, SPRINGFIELD, VA 22151	FAIRFAX

MAILING ADDRESS	MAILING CITY AND STATE	ZIPCODE
WASHINGTON GAS/ SPFLD OPER CTR 6801 INDUSTRIAL ROAD SPRINGFIELD, VA 22151	SPRINGFIELD, VA	22151

PARENT COMPANY (IF APPLICABLE)	TELEPHONE NUMBER	PRIMARY SIC CODE
	(703) 750-5654	4924

Forms Agenc Use Only

FACILITY TOTALS *(Sum emissions from attached pages)*

	ANNUAL		OZONE SEASON	
TOTAL VOC EMISSIONS FOR 2000	5.03	TONS/YR	46.81	LBS/DAY
TOTAL NO_X EMISSIONS FOR 2000	59.63	TONS/YR	561.56	LBS/DAY
TOTAL SO_2 EMISSIONS FOR 2000	0.01	TONS/YR	NA	
TOTAL PM_{10} EMISSIONS FOR 2000	5.03	TONS/YR	NA	
TOTAL PB EMISSIONS FOR 2000	Ø	TONS/YR	NA	
TOTAL TRS EMISSIONS FOR 2000	Ø	TONS/YR	NA	
TOTAL TNMOC EMISSIONS FOR 2000	Ø	TONS/YR	NA	
TOTAL non-VOC/non-PM_{10} HAP EMISSIONS FOR 2000	Ø	TONS/YR	NA	

PLEASE ATTACH "ANNUAL UPDATE" FORM.
PLEASE ATTACH "EMISSION STATEMENT CERTIFICATION" with appropriate signature.

OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 51-059-0056: 7\ POINT NO. 01-01 SEGMENT NO. 01 SCC NO. 20200202

THRUPUT(with units)	16.52 mmcf	5.37 mmcf
NO. OPERATING DAYS	241 days	75 days
NO. OPERATING HOURS PER DAY	24 hours	24 hours
DAILY THRUPUT(with units)=thruput /days		0.07 per day
VOC EMISSION FACTOR(with units)=E.F.	0.17 g/hp-hr	0.17 g/hp-hr
Source of Emission Factor [1]	*O	*O
VOC CONTROL DEVICE CODE [2]	OOO	OOO
Avg. VOC CONTROL EFFICIENCY[3]=C.E.	0 %	0 %
	0.93 tons VOC per yr	7.72 lbs VOC per day
NOx EMISSION FACTOR (with units) E.F.	**2 g/hp-hr	**2 g/hp-hr
Source of Emission Factor [1]	ST	ST
NOx CONTROL DEVICE CODE [2]	65	65
Avg. NOx CONTROL EFFICIENCY [3]=C.E.	87 %	87 %
	10.91 tons NOx per yr	90.84 lbs NOx per day
SO2 EMISSION FACTOR(with units)= E.F.	0 g/hp-hr	
Source of Emission Factor [1]	*O	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
SO2 CONTROL DEVICE CODE [2]	OOO	
Avg. SO2 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0 tons SO2 per yr	
PM10 EMISSION FACTOR (with units)= E.F.	0.16 g/hp-hr	
Source of Emission Factor [1]	*O	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
PM10 CONTROL DEVICE CODE [2]	OOO	
Avg. PM10 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0.87 tons PM10 per yr	
TRS EMISSION FACTOR(with units)= E.F.	N/A	
Source of Emission Factor [1]		
TRS CONTROL DEVICE CODE [2]		
Avg. TRS CONTROL EFFICIENCY[3]=C.E.	%	
	tons TRS per yr	
PB EMISSION FACTOR(with units)= E.F.	N/A	
Source of Emission Factor [1]		
PB CONTROL DEVICE CODE [2]		
Avg. PB CONTROL EFFICIENCY[3]=C.E.	%	
	tons PB per yr	

BASIS FOR CONTROL EFFICIENCIES. ____ tested (by EPA Reference Method); ____ tested (other), ____ design, ____ material balance; ____ other (describe on separate sheet).

1. AP-42; ST= Stack Test; CEMS; F = Federal Factor (EPA standard factor from AIRS); O = Other (describe on separate sheet; use subject to DEQ approval)
2. See control device codes listed in Appendix.
3. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. EF is identified to be "with controls").
4. ANNUAL EMISSIONS = ANNUAL THRUPUT x EF x FP x (1/2000) x (100-CE)/100; OZONE EMISSIONS = DAILY THRUPUT x EF x FP x (100-CE)/100

* Southwest Research Institute *Compilation of Emissions Data for Stationary Reciprocating Gas Engines and Gas Turbines in Use by the Natural Gas Pipeline Transmission Industry* 1988; previously approved by DEQ

** NOx emission factor changed from 15g/bhp-hr to 2g/bhp-hr due to the installation of control equipment

OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 51-059-0056: 7015 POINT NO. 01-02 SEGMENT NO. 01 SCC NO.20200202

THRUPUT(with units)	13.56 mmcf	3.56 mmcf
NO. OPERATING DAYS	198 days	50 days
NO. OPERATING HOURS PER DAY	24 hours	24 hours
DAILY THRUPUT(with units)=thruput /days		0.07 per day
VOC EMISSION FACTOR(with units)=E.F.	0.17 g/hp-hr	0.17 g/hp-hr
Source of Emission Factor [1]	*O	*O
VOC CONTROL DEVICE CODE [2]	OOO	OOO
Avg. VOC CONTROL EFFICIENCY[3]=C.E.	0 %	0 %
	0.76 tons VOC per yr	7.66 lbs VOC per day
NOx EMISSION FACTOR (with units) E.F.	**2 g/hp-hr	**2 g/hp-hr
Source of Emission Factor [1]	ST	ST
NOx CONTROL DEVICE CODE [2]	65	65
Avg. NOx CONTROL EFFICIENCY [3]=C.E.	87 %	87 %
	8.99 tons NOx per yr	90.2 lbs NOx per day
SO2 EMISSION FACTOR(with units)= E.F.	0 g/hp-hr	
Source of Emission Factor [1]	*O	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
SO2 CONTROL DEVICE CODE [2]	OOO	
Avg. SO2 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0 tons SO2 per yr	
PM10 EMISSION FACTOR (with units)= E.F.	0.16 g/hp-hr	
Source of Emission Factor [1]	*O	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
PM10 CONTROL DEVICE CODE [2]	OOO	
Avg. PM10 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0.72 tons PM10 per yr	
TRS EMISSION FACTOR(with units)= E.F.	N/A	
Source of Emission Factor [1]		
TRS CONTROL DEVICE CODE [2]		
Avg. TRS CONTROL EFFICIENCY[3]=C.E.	%	
	tons TRS per yr	
PB EMISSION FACTOR(with units)= E.F.	N/A	
Source of Emission Factor [1]		
PB CONTROL DEVICE CODE [2]		
Avg. PB CONTROL EFFICIENCY[3]=C.E.	%	
	tons PB per yr	

BASIS FOR CONTROL EFFICIENCIES: ____tested (by EPA Reference Method); ____ tested (other); ____design; ____material balance; ____other (describe on separate sheet).

1. AP-42; ST= Stack Test; CEMS; F = Federal Factor (EPA standard factor from AIRS); O = Other (describe on separate sheet; use subject to DEQ approval)
2. See control device codes listed in Appendix.
3. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. EF is identified to be "with controls").
4. ANNUAL EMISSIONS = ANNUAL THRUPUT x EF x FP x (1/2000) x (100-CE)/100; OZONE EMISSIONS = DAILY THRUPUT x EF x FP x (100-CE)/100

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** NOx emission factor changed from 15g/bhp-hr to 2g/bhp-hr due to the installation of control equipment

OPTION I: EMISSION FACTOR METHOD

REGISTRATION # : 51-059-0056; 70151 POINT NO. 01-03 SEGMENT NO. 01 SCC NO. 10300602

THRUPUT(with units)	0.88 mmcf	0.38 mmcf
NO. OPERATING DAYS	8.6 days	3.7 days
NO. OPERATING HOURS PER DAY	10 hours	10 hours
DAILY THRUPUT(with units)=thruput /days		0.103 per day
VOC EMISSION FACTOR(with units)=E.F.	5.5 lb/mmcf	5.5 lb/mmcf
Source of Emission Factor [1]	AP-42	AP-42
VOC CONTROL DEVICE CODE [2]	OOO	OOO
Avg. VOC CONTROL EFFICIENCY[3]=C.E.	0 %	0 %
	0.002 tons VOC per yr	0.02 lbs VOC per day
NOx EMISSION FACTOR (with units) E.F.	100 lb/mmcf	100 lb/mmcf
Source of Emission Factor [1]	AP-42	AP-42
NOx CONTROL DEVICE CODE [2]	OOO	OOO
Avg. NOx CONTROL EFFICIENCY [3]=C.E.	0 %	0 %
	0.04 tons NOx per yr	0.3 lbs NOx per day
SO2 EMISSION FACTOR(with units)= E.F.	0.6 lb/mmcf	
Source of Emission Factor [1]	AP-42	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
SO2 CONTROL DEVICE CODE [2]	OOO	
Avg. SO2 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0.00026 tons SO2 per yr	
PM10 EMISSION FACTOR (with units)= E.F.	7.6 lb/mmcf	
Source of Emission Factor [1]	AP-42	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
PM10 CONTROL DEVICE CODE [2]	OOO	
Avg. PM10 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0.0034 tons PM10 per yr	
TRS EMISSION FACTOR(with units)= E.F	N/A	
Source of Emission Factor [1]		
TRS CONTROL DEVICE CODE [2]		
Avg. TRS CONTROL EFFICIENCY[3]=C.E.	%	
	tons TRS per yr	
PB EMISSION FACTOR(with units)= E.F.	N/A	
Source of Emission Factor [1]		
PB CONTROL DEVICE CODE [2]		
Avg. PB CONTROL EFFICIENCY[3]=C.E.	%	
	tons PB per yr	

BASIS FOR CONTROL EFFICIENCIES: ____tested (by EPA Reference Method); ____ tested (other); ____design; ____material balance; ____other (describe on separate sheet).

1. AP-42; ST= Stack Test; CEMS; F = Federal Factor (EPA standard factor from AIRS); O = Other (describe on separate sheet; use subject to DEQ approval)
2. See control device codes listed in Appendix.
3. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. EF is identified to be "with controls").
4. ANNUAL EMISSIONS = ANNUAL THRUPUT x EF x FP x (1/2000) x (100-CE)/100; OZONE EMISSIONS = DAILY THRUPUT x EF x FP x (100-CE)/100

OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 51-059-0056: 701.. POINT NO. 02-04 SEGMENT NO. 01 SCC NO.20200202

THRUPUT(with units)	15.04	mmcf	4.65	mmcf
NO. OPERATING DAYS	219	days	65	days
NO. OPERATING HOURS PER DAY	24	hours	24	hours
DAILY THRUPUT(with units)=thruput /days			0.07	per day
VOC EMISSION FACTOR(with units)=E.F.	0.17 g/hp-hr		0.17 g/hp-hr	
Source of Emission Factor [1]	*O		*O	
VOC CONTROL DEVICE CODE [2]	OOO		OOO	
Avg. VOC CONTROL EFFICIENCY[3]=C.E.	0	%	0	%
	0.84	tons VOC per yr	7.71	lbs VOC per day
NOx EMISSION FACTOR (with units) E.F.	**2 g/hp-hr		**2 g/hp-hr	
Source of Emission Factor [1]	ST		ST	
NOx CONTROL DEVICE CODE [2]	65		65	
Avg. NOx CONTROL EFFICIENCY [3]=C.E.	87	%	87	%
	9.91	tons NOx per yr	90.7	lbs NOx per day
SO2 EMISSION FACTOR(with units)= E.F.	0 g/hp-hr			
Source of Emission Factor [1]	*O			
FUEL PARAMETER (% ash or % sulfur) = FP	0	%		
SO2 CONTROL DEVICE CODE [2]	OOO			
Avg. SO2 CONTROL EFFICIENCY[3]=C.E.	0	%		
	0	tons SO2 per yr		
PM10 EMISSION FACTOR (with units)= E.F.	0.16 g/hp-hr			
Source of Emission Factor [1]	*O			
FUEL PARAMETER (% ash or % sulfur) = FP	0	%		
PM10 CONTROL DEVICE CODE [2]	OOO			
Avg. PM10 CONTROL EFFICIENCY[3]=C.E.	0	%		
	0.79	tons PM10 per yr		
TRS EMISSION FACTOR(with units)= E.F.	N/A			
Source of Emission Factor [1]				
TRS CONTROL DEVICE CODE [2]				
Avg. TRS CONTROL EFFICIENCY[3]=C.E.		%		
		tons TRS per yr		
PB EMISSION FACTOR(with units)= E.F.	N/A			
Source of Emission Factor [1]				
PB CONTROL DEVICE CODE [2]				
Avg. PB CONTROL EFFICIENCY[3]=C.E.		%		
		tons PB per yr		

BASIS FOR CONTROL EFFICIENCIES: ____tested (by EPA Reference Method); ____ tested (other); ____design; ____material balance; ____other (describe on separate sheet).

1. AP-42; ST= Stack Test; CEMS; F = Federal Factor (EPA standard factor from AIRS); O = Other (describe on separate sheet; use subject to DEQ approval)
2. See control device codes listed in Appendix.
3. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. EF is identified to be "with controls").
4. ANNUAL EMISSIONS = ANNUAL THRUPUT x EF x FP x (1/2000) x (100-CE)/100; OZONE EMISSIONS = DAILY THRUPUT x EF x FP x (100-CE)/100

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OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 51-059-0056: 701 POINT NO. 02-05 SEGMENT NO. 01 SCC NO. 20200202

THRUPUT(with units)	14.03 mmcf	3.24 mmcf
NO. OPERATING DAYS	206 days	46 days
NO. OPERATING HOURS PER DAY	24 hours	24 hours
DAILY THRUPUT(with units)=thruput /days		0.07 per day
VOC EMISSION FACTOR(with units)=E.F.	0.17 g/hp-hr	0.17 g/hp-hr
Source of Emission Factor [1]	*O	*O
VOC CONTROL DEVICE CODE [2]	OOO	OOO
Avg. VOC CONTROL EFFICIENCY[3]=C.E.	0 %	0 %
	0.79 tons VOC per yr	7.66 lbs VOC per day
NOx EMISSION FACTOR (with units) E.F.	**2 g/hp-hr	**2 g/hp-hr
Source of Emission Factor [1]	ST	ST
NOx CONTROL DEVICE CODE [2]	65	65
Avg. NOx CONTROL EFFICIENCY [3]=C.E.	87 %	87 %
	9.32 tons NOx per yr	90.11 lbs NOx per day
SO2 EMISSION FACTOR(with units)= E.F.	0 g/hp-hr	
Source of Emission Factor [1]	*O	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
SO2 CONTROL DEVICE CODE [2]	OOO	
Avg. SO2 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0 tons SO2 per yr	
PM10 EMISSION FACTOR (with units)= E.F	0.16 g/hp-hr	
Source of Emission Factor [1]	*O	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
PM10 CONTROL DEVICE CODE [2]	OOO	
Avg. PM10 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0.75 tons PM10 per yr	
TRS EMISSION FACTOR(with units)= E.F	N/A	
Source of Emission Factor [1]		
TRS CONTROL DEVICE CODE [2]		
Avg. TRS CONTROL EFFICIENCY[3]=C.E	%	
	tons TRS per yr	
PB EMISSION FACTOR(with units)= E.F.	N/A	
Source of Emission Factor [1]		
PB CONTROL DEVICE CODE [2]		
Avg. PB CONTROL EFFICIENCY[3]=C.E	%	
	tons PB per yr	

BASIS FOR CONTROL EFFICIENCIES: ____tested (by EPA Reference Method); ____ tested (other); ____design; ____material balance; ____other (describe on separate sheet).

1. AP-42; ST= Stack Test; CEMS; F = Federal Factor (EPA standard factor from AIRS); O = Other (describe on separate sheet; use subject to DEQ approval)
2. See control device codes listed in Appendix.
3. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. EF is identified to be "with controls").
4. ANNUAL EMISSIONS = ANNUAL THRUPUT x EF x FP x (1/2000) x (100-CE)/100; OZONE EMISSIONS = DAILY THRUPUT x EF x FP x (100-CE)/100

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2000 EMISSION CALCULATIONS

OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 51-059-0056; 70151 POINT NO. 02-06 SEGMENT NO. 01 SCC NO. 10300602

THRUPUT(with units)	0.85 mmcf	0.36 mmcf
NO. OPERATING DAYS	8.3 days	3.5 days
NO. OPERATING HOURS PER DAY	10 hours	10 hours
DAILY THRUPUT(with units)=thruput /days		0.103 per day
VOC EMISSION FACTOR(with units)=E.F.	5.5 lb/mmcf	5.5 lb/mmcf
Source of Emission Factor [1]	AP-42	AP-42
VOC CONTROL DEVICE CODE [2]	OOO	OOO
Avg. VOC CONTROL EFFICIENCY[3]=C.E.	0 %	0 %
	0.002 tons VOC per yr	0.02 lbs VOC per day
NOx EMISSION FACTOR (with units) E.F.	100 lb/mmcf	100 lb/mmcf
Source of Emission Factor [1]	AP-42	AP-42
NOx CONTROL DEVICE CODE [2]	OOO	OOO
Avg. NOx CONTROL EFFICIENCY [3]=C.E.	0 %	0 %
	0.04 tons NOx per yr	0.32 lbs NOx per day
SO2 EMISSION FACTOR(with units)= E.F.	0.6 lb/mmcf	
Source of Emission Factor [1]	AP-42	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
SO2 CONTROL DEVICE CODE [2]	OOO	
Avg. SO2 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0.0002 tons SO2 per yr	
PM10 EMISSION FACTOR (with units)= E.F.	7.6 lb/mmcf	
Source of Emission Factor [1]	AP-42	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
PM10 CONTROL DEVICE CODE [2]	OOO	
Avg. PM10 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0.003 tons PM10 per yr	
TRS EMISSION FACTOR(with units)= E.F.	N/A	
Source of Emission Factor [1]		
TRS CONTROL DEVICE CODE [2]		
Avg. TRS CONTROL EFFICIENCY[3]=C.E.	%	
	tons TRS per yr	
PB EMISSION FACTOR(with units)= E.F.	N/A	
Source of Emission Factor [1]		
PB CONTROL DEVICE CODE [2]		
Avg. PB CONTROL EFFICIENCY[3]=C.E.	%	
	tons PB per yr	

BASIS FOR CONTROL EFFICIENCIES: ____tested (by EPA Reference Method); ____ tested (other); ____design; ____material balance; ____other (describe on separate sheet):

1. AP-42; ST= Stack Test; CEMS; F = Federal Factor (EPA standard factor from AIRS); O = Other (describe on separate sheet; use subject to DEQ approval)
2. See control device codes listed in Appendix.
3. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. EF is identified to be "with controls").
4. ANNUAL EMISSIONS = ANNUAL THRUPUT x EF x FP x (1/2000) x (100-CE)/100; OZONE EMISSIONS = DAILY THRUPUT x EF x FP x (100-CE)/100

OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 51-059-0056: 7[illegible]1 POINT NO. 03-07 SEGMENT NO. 01 SCC NO. 20200202

THRUPUT(with units)	11.32 mmcf	2.19 mmcf
NO. OPERATING DAYS	166 days	31 days
NO. OPERATING HOURS PER DAY	24 hours	24 hours
DAILY THRUPUT(with units)=thruput /days		0.07 per day
VOC EMISSION FACTOR(with units)=E.F.	0.17 g/hp-hr	0.17 g/hp-hr
Source of Emission Factor [1]	*O	*O
VOC CONTROL DEVICE CODE [2]	OOO	OOO
Avg. VOC CONTROL EFFICIENCY[3]=C.E.	0 %	0 %
	0.64 tons VOC per yr	7.64 lbs VOC per day
NOx EMISSION FACTOR (with units) E.F.	**2 g/hp-hr	**2 g/hp-hr
Source of Emission Factor [1]	ST	ST
NOx CONTROL DEVICE CODE [2]	65	65
Avg. NOx CONTROL EFFICIENCY [3]=C.E.	87 %	87 %
	7.52 tons NOx per yr	89.8 lbs NOx per day
SO2 EMISSION FACTOR(with units)= E.F.	0 g/hp-hr	
Source of Emission Factor [1]	*O	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
SO2 CONTROL DEVICE CODE [2]	OOO	
Avg. SO2 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0 tons SO2 per yr	
PM10 EMISSION FACTOR (with units)= E.F.	0.16 g/hp-hr	
Source of Emission Factor [1]	*O	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
PM10 CONTROL DEVICE CODE [2]	OOO	
Avg. PM10 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0.6 tons PM10 per yr	
TRS EMISSION FACTOR(with units)= E.F.	N/A	
Source of Emission Factor [1]		
TRS CONTROL DEVICE CODE [2]		
Avg. TRS CONTROL EFFICIENCY[3]=C.E.	%	
	tons TRS per yr	
PB EMISSION FACTOR(with units)= E.F.	N/A	
Source of Emission Factor [1]		
PB CONTROL DEVICE CODE [2]		
Avg. PB CONTROL EFFICIENCY[3]=C.E.	%	
	tons PB per yr	

BASIS FOR CONTROL EFFICIENCIES: ____tested (by EPA Reference Method); ____ tested (other); ____design; ____material balance; ____other (describe on separate sheet).

1. AP-42; ST= Stack Test; CEMS; F = Federal Factor (EPA standard factor from AIRS); O = Other (describe on separate sheet; use subject to DEQ approval)
2. See control device codes listed in Appendix.
3. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. EF is identified to be "with controls").
4. ANNUAL EMISSIONS = ANNUAL THRUPUT x EF x FP x (1/2000) x (100-CE)/100; OZONE EMISSIONS = DAILY THRUPUT x EF x FP x (100-CE)/100

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OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 51-059-0056: 701[illegible] POINT NO. 03-08 SEGMENT NO. 01 SCC NO. 20200202

THRUPUT(with units)	17.45	mmcf	5.15	mmcf
NO. OPERATING DAYS	255	days	72	days
NO. OPERATING HOURS PER DAY	24	hours	24	hours
DAILY THRUPUT(with units)=thruput /days			0.07	per day
VOC EMISSION FACTOR(with units)=E.F.	0.17 g/hp-hr		0.17 g/hp-hr	
Source of Emission Factor [1]	*O		*O	
VOC CONTROL DEVICE CODE [2]	OOO		OOO	
Avg. VOC CONTROL EFFICIENCY[3]=C.E.	0	%	0	%
	0.98	tons VOC per yr	7.73	lbs VOC per day
NOx EMISSION FACTOR (with units) E.F.	**2 g/hp-hr		**2 g/hp-hr	
Source of Emission Factor [1]	ST		ST	
NOx CONTROL DEVICE CODE [2]	65		65	
Avg. NOx CONTROL EFFICIENCY [3]=C.E.	87	%	87	%
	11.58	tons NOx per yr	90.95	lbs NOx per day
SO2 EMISSION FACTOR(with units)= E.F.	0 g/hp-hr			
Source of Emission Factor [1]	*O			
FUEL PARAMETER (% ash or % sulfur) = FP	0	%		
SO2 CONTROL DEVICE CODE [2]	OOO			
Avg. SO2 CONTROL EFFICIENCY[3]=C.E.	0	%		
	0	tons SO2 per yr		
PM10 EMISSION FACTOR (with units)= E.F.	0.16 g/hp-hr			
Source of Emission Factor [1]	*O			
FUEL PARAMETER (% ash or % sulfur) = FP	0	%		
PM10 CONTROL DEVICE CODE [2]	OOO			
Avg. PM10 CONTROL EFFICIENCY[3]=C.E.	0	%		
	0.93	tons PM10 per yr		
TRS EMISSION FACTOR(with units)= E.F.	N/A			
Source of Emission Factor [1]				
TRS CONTROL DEVICE CODE [2]				
Avg. TRS CONTROL EFFICIENCY[3]=C.E.		%		
		tons TRS per yr		
PB EMISSION FACTOR(with units)= E.F.	N/A			
Source of Emission Factor [1]				
PB CONTROL DEVICE CODE [2]				
Avg. PB CONTROL EFFICIENCY[3]=C.E.		%		
		tons PB per yr		

BASIS FOR CONTROL EFFICIENCIES: ____tested (by EPA Reference Method); ____tested (other); ____design; ____material balance; ____other (describe on separate sheet).

1. AP-42; ST= Stack Test; CEMS; F = Federal Factor (EPA standard factor from AIRS); O = Other (describe on separate sheet; use subject to DEQ approval)
2. See control device codes listed in Appendix.
3. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. EF is identified to be "with controls").
4. ANNUAL EMISSIONS = ANNUAL THRUPUT x EF x FP x (1/2000) x (100-CE)/100; OZONE EMISSIONS = DAILY THRUPUT x EF x FP x (100-CE)/100

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SECTION I: EMISSION FACTOR METHOD

REGISTRATION #: 51-059-0056; 70151 POINT NO. 03-09 SEGMENT NO. 01 SCC NO. 10300602

THRUPUT(with units)	0.82 mmcf	0.34 mmcf
NO. OPERATING DAYS	7.9 days	3.3 days
NO. OPERATING HOURS PER DAY	10 hours	10 hours
DAILY THRUPUT(with units)=thruput /days		0.103 per day
VOC EMISSION FACTOR(with units)=E.F.	5.5 lb/mmcf	5.5 lb/mmcf
Source of Emission Factor [1]	AP-42	AP-42
VOC CONTROL DEVICE CODE [2]	OOO	OOO
Avg. VOC CONTROL EFFICIENCY[3]=C.E.	0 %	0 %
	0.002 tons VOC per yr	0.02 lbs VOC per day
NOx EMISSION FACTOR (with units) E.F.	100 lb/mmcf	100 lb/mmcf
Source of Emission Factor [1]	AP-42	AP-42
NOx CONTROL DEVICE CODE [2]	OOO	OOO
Avg. NOx CONTROL EFFICIENCY [3]=C.E.	0 %	0 %
	0.04 tons NOx per yr	0.33 lbs NOx per day
SO2 EMISSION FACTOR(with units)= E.F.	0.6 lb/mmcf	
Source of Emission Factor [1]	AP-42	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
SO2 CONTROL DEVICE CODE [2]	OOO	
Avg. SO2 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0.0002 tons SO2 per yr	
PM10 EMISSION FACTOR (with units)= E.F.	7.6 lb/mmcf	
Source of Emission Factor [1]	AP-42	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
PM10 CONTROL DEVICE CODE [2]	OOO	
Avg. PM10 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0.003 tons PM10 per yr	
TRS EMISSION FACTOR(with units)= E.F.	N/A	
Source of Emission Factor [1]		
TRS CONTROL DEVICE CODE [2]		
Avg. TRS CONTROL EFFICIENCY[3]=C.E	%	
	tons TRS per yr	
PB EMISSION FACTOR(with units)= E.F.	N/A	
Source of Emission Factor [1]		
PB CONTROL DEVICE CODE [2]		
Avg. PB CONTROL EFFICIENCY[3]=C.E.	%	
	tons PB per yr	

BASIS FOR CONTROL EFFICIENCIES: ____tested (by EPA Reference Method); ____ tested (other); ____design; ____material balance; ____other (describe on separate sheet).

1. AP-42; ST= Stack Test; CEMS; F = Federal Factor (EPA standard factor from AIRS); O = Other (describe on separate sheet; use subject to DEQ approval)
2. See control device codes listed in Appendix.
3. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. EF is identified to be "with controls").
4. ANNUAL EMISSIONS = ANNUAL THRUPUT x EF x FP x (1/2000) x (100-CE)/100; OZONE EMISSIONS = DAILY THRUPUT x EF x FP x (100-CE)/100

* Please note that these hours are very conservative (> 365 days per year and > 90 days during ozone season); this is due to the fact that the boiler hours are being determined based on the two supporting generator hours; in order to not underestimate hours for the boiler, it has to be assumed that the generators operate one at a time; therefore, the hours for the two generators are summed in order to obtain hours for the boiler (although this is a conservative estimation).

OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 51-059-0056; 70[illegible]1 POINT NO. 04-10 SEGMENT NO. 01 SCC NO. 10500206

THRUPUT(with units)	1.75 mmcf	1.68 mmcf
NO. OPERATING DAYS	23 days	22 days
NO. OPERATING HOURS PER DAY	24 hours	24 hours
DAILY THRUPUT(with units)=thruput /days		0.08 per day
VOC EMISSION FACTOR(with units)=E.F.	3.8 lb/mmcf	3.8 lb/mmcf
Source of Emission Factor [1]	AP-42	AP-42
VOC CONTROL DEVICE CODE [2]	OOO	OOO
Avg. VOC CONTROL EFFICIENCY[3]=C.E.	0 %	0 %
	0.003 tons VOC per yr	0.29 lbs VOC per day
NOx EMISSION FACTOR (with units) E.F.	100 lb/mmcf	100 lb/mmcf
Source of Emission Factor [1]	AP-42	AP-42
NOx CONTROL DEVICE CODE [2]	OOO	OOO
Avg. NOx CONTROL EFFICIENCY [3]=C.E.	0 %	0 %
	0.087 tons NOx per yr	7.62 lbs NOx per day
SO2 EMISSION FACTOR(with units)= E.F	0.6 lb/mmcf	
Source of Emission Factor [1]	AP-42	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
SO2 CONTROL DEVICE CODE [2]	OOO	
Avg. SO2 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0.0005 tons SO2 per yr	
PM10 EMISSION FACTOR (with units)= E.F.	12 lb/mmcf	
Source of Emission Factor [1]	AP-42	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
PM10 CONTROL DEVICE CODE [2]	OOO	
Avg. PM10 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0.01 tons PM10 per yr	
TRS EMISSION FACTOR(with units)= E.F.	N/A	
Source of Emission Factor [1]		
TRS CONTROL DEVICE CODE [2]		
Avg. TRS CONTROL EFFICIENCY[3]=C.E.	%	
	tons TRS per yr	
PB EMISSION FACTOR(with units)= E.F	N/A	
Source of Emission Factor [1]		
PB CONTROL DEVICE CODE [2]		
Avg. PB CONTROL EFFICIENCY[3]=C.E.	%	
	tons PB per yr	

BASIS FOR CONTROL EFFICIENCIES: ____tested (by EPA Reference Method); ____ tested (other); ____design; ____material balance; ____other (describe on separate sheet).

1. AP-42; ST= Stack Test; CEMS; F = Federal Factor (EPA standard factor from AIRS); O = Other (describe on separate sheet; use subject to DEQ approval)
2. See control device codes listed in Appendix.
3. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. EF is identified to be "with controls").
4. ANNUAL EMISSIONS = ANNUAL THRUPUT x EF x FP x (1/2000) x (100-CE)/100; OZONE EMISSIONS = DAILY THRUPUT x EF x FP x (100-CE)/100

OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 51-059-0056: 70 POINT NO. 06-12 SEGMENT NO. 01 SCC NO. 20300101

THRUPUT(with units)	1658	gallons	3	gallons
NO. OPERATING DAYS	2	days	< 1	days
NO. OPERATING HOURS PER DAY	*24	hours/day	*6	hours/day
DAILY THRUPUT(with units)=thruput /days			**3	gallons per day
VOC EMISSION FACTOR(with units)=E.F.	0.04 g/hp-hr		0.04 g/hp-hr	
Source of Emission Factor [1]	***O		***O	
VOC CONTROL DEVICE CODE [2]	OOO		OOO	
Avg. VOC CONTROL EFFICIENCY[3]=C.E.	0	%	0	%
	0.0007	tons VOC per yr	0.15	lbs VOC per day
NOx EMISSION FACTOR (with units) E.F	1.6 g/hp-hr		1.6 g/hp-hr	
Source of Emission Factor [1]	***O		***O	
NOx CONTROL DEVICE CODE [2]	OOO		OOO	
Avg. NOx CONTROL EFFICIENCY [3]=C.E.	0	%	0	%
	0.03	tons NOx per yr	6.14	lbs NOx per day
SO2 EMISSION FACTOR(with units)= E.F.	0 g/hp-hr		[illegible]	
Source of Emission Factor [1]	***O		[illegible]	
FUEL PARAMETER (% ash or % sulfur) = FP	0.0469	%	[illegible]	
SO2 CONTROL DEVICE CODE [2]	OOO		[illegible]	
Avg. SO2 CONTROL EFFICIENCY[3]=C.E.	0	%	[illegible]	
	0	tons SO2 per yr	[illegible]	
PM10 EMISSION FACTOR (with units)= E.F.	0.16 g/hp-hr		[illegible]	
Source of Emission Factor [1]	***O		[illegible]	
FUEL PARAMETER (% ash or % sulfur) = FP	0.0469	%	[illegible]	
PM10 CONTROL DEVICE CODE [2]	OOO		[illegible]	
Avg. PM10 CONTROL EFFICIENCY[3]=C.E.	0	%	[illegible]	
	0.003	tons PM10 per yr	[illegible]	
TRS EMISSION FACTOR(with units)= E.F.	N/A		[illegible]	
Source of Emission Factor [1]			[illegible]	
TRS CONTROL DEVICE CODE [2]			[illegible]	
Avg. TRS CONTROL EFFICIENCY[3]=C.E.		%	[illegible]	
		tons TRS per yr	[illegible]	
PB EMISSION FACTOR(with units)= E.F.	N/A		[illegible]	
Source of Emission Factor [1]			[illegible]	
PB CONTROL DEVICE CODE [2]			[illegible]	
Avg. PB CONTROL EFFICIENCY[3]=C.E.		%	[illegible]	
		tons PB per yr	[illegible]	

BASIS FOR CONTROL EFFICIENCIES: ____tested (by EPA Reference Method); ____ tested (other); ____design; ____material balance; ____other (describe on separate sheet).

1. AP-42; ST= Stack Test; CEMS; F = Federal Factor (EPA standard factor from AIRS); O = Other (describe on separate sheet; use subject to DEQ approval)
2. See control device codes listed in Appendix.
3. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. EF is identified to be "with controls").
4. ANNUAL EMISSIONS = ANNUAL THRUPUT x EF x FP x (1/2000) x (100-CE)/100; OZONE EMISSIONS = DAILY THRUPUT x EF x FP x (100-CE)/100

* Due to the fact that this is a stand-by generator, the actual hrs run divided by total number of operating days was used (i.e. NOT based on 24 hour/day operation)

** Although gallons/hr is provided here as requested, emission calculations were based on hours operated since emission factors are in units of grams per hp-hr

*** Southwest Research Institute *Compilation of Emissions Data for Stationary Reciprocating Gas Engines and Gas Turbines in Use by the Natural Gas Pipeline Transmission Industry* 1988; previously approved by DEQ

2000 EMISSION CALCULATIONS

OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 51-059-0056: 70151 POINT NO. 07-13 SEGMENT NO. 01 SCC NO. 10500206

THRUPUT(with units)	18 mmcf	3.6 mmcf
NO. OPERATING DAYS	365 days	92 days
NO. OPERATING HOURS PER DAY	24 hours	24 hours
DAILY THRUPUT(with units)=thruput /days		0.04 per day
VOC EMISSION FACTOR(with units)=E.F.	3.8 lb/mmcf	3.8 lb/mmcf
Source of Emission Factor [1]	AP-42	AP-42
VOC CONTROL DEVICE CODE [2]	OOO	OOO
Avg. VOC CONTROL EFFICIENCY[3]=C.E.	0 %	0 %
	0.03 tons VOC per yr	0.15 lbs VOC per day
NOx EMISSION FACTOR (with units) E.F.	100 lb/mmcf	100 lb/mmcf
Source of Emission Factor [1]	AP-42	AP-42
NOx CONTROL DEVICE CODE [2]	OOO	OOO
Avg. NOx CONTROL EFFICIENCY [3]=C.E.	0 %	0 %
	0.9 tons NOx per yr	3.9 lbs NOx per day
SO2 EMISSION FACTOR(with units)= E.F.	0.6 lb/mmcf	
Source of Emission Factor [1]	AP-42	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
SO2 CONTROL DEVICE CODE [2]	OOO	
Avg. SO2 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0.005 tons SO2 per yr	
PM10 EMISSION FACTOR (with units)= E.F.	13.7 lb/mmcf	
Source of Emission Factor [1]	AP-42	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
PM10 CONTROL DEVICE CODE [2]	OOO	
Avg. PM10 CONTROL EFFICIENCY[3]=C.E.	0 %	
	0.12 tons PM10 per yr	
TRS EMISSION FACTOR(with units)= E.F	N/A	
Source of Emission Factor [1]		
TRS CONTROL DEVICE CODE [2]		
Avg. TRS CONTROL EFFICIENCY[3]=C.E.	%	
	tons TRS per yr	
PB EMISSION FACTOR(with units)= E.F.	N/A	
Source of Emission Factor [1]		
PB CONTROL DEVICE CODE [2]		
Avg. PB CONTROL EFFICIENCY[3]=C.E	%	
	tons PB per yr	

BASIS FOR CONTROL EFFICIENCIES: ____tested (by EPA Reference Method); ____ tested (other); ____design; ____material balance; ____other (describe on separate sheet).

1. AP-42; ST= Stack Test; CEMS; F = Federal Factor (EPA standard factor from AIRS); O = Other (describe on separate sheet; use subject to DEQ approval)
2. See control device codes listed in Appendix.
3. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. EF is identified to be "with controls").
4. ANNUAL EMISSIONS = ANNUAL THRUPUT x EF x FP x (1/2000) x (100-CE)/100; OZONE EMISSIONS = DAILY THRUPUT x EF x FP x (100-CE)/100

OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 51-059-0056; 70 POINT NO. 08-14 SEGMENT NO. 01 SCC NO. 20200401

THRUPUT(with units)	1680	gallons	94	gallons
NO. OPERATING DAYS	18	days	5	days
NO. OPERATING HOURS PER DAY	*2.57	hours/day	*2.6	hours/day
DAILY THRUPUT(with units)=thruput /days			**18.8	gallons per day
VOC EMISSION FACTOR(with units)=E.F.	1 g/bhp-hr		1 g/bhp-hr	
Source of Emission Factor [1]	***O		***O	
VOC CONTROL DEVICE CODE [2]	000		000	
Avg. VOC CONTROL EFFICIENCY[3]=C.E.	0	%	0	%
	0.038	tons VOC per yr	0.048	lbs VOC per day
NOx EMISSION FACTOR (with units) E.F.	6.9 g/bhp-hr		6.9 g/bhp-hr	
Source of Emission Factor [1]	***O		***O	
NOx CONTROL DEVICE CODE [2]	000		000	
Avg. NOx CONTROL EFFICIENCY [3]=C.E.	0	%	0	%
	0.264	tons NOx per yr	0.329	lbs NOx per day
SO2 EMISSION FACTOR(with units)= E.F.	0.1 g/bhp-hr			
Source of Emission Factor [1]	AP-42			
FUEL PARAMETER (% ash or % sulfur) = FP	0.0469	%		
SO2 CONTROL DEVICE CODE [2]	000			
Avg. SO2 CONTROL EFFICIENCY[3]=C.E.	0	%		
	0.004	tons SO2 per yr		
PM10 EMISSION FACTOR (with units)= E.F.	6 g/bhp-hr			
Source of Emission Factor [1]	***O			
FUEL PARAMETER (% ash or % sulfur) = FP	0.0469	%		
PM10 CONTROL DEVICE CODE [2]	000			
Avg. PM10 CONTROL EFFICIENCY[3]=C.E.	0	%		
	0.23	tons PM10 per yr		
TRS EMISSION FACTOR(with units)= E.F.	N/A			
Source of Emission Factor [1]				
TRS CONTROL DEVICE CODE [2]				
Avg. TRS CONTROL EFFICIENCY[3]=C.E.		%		
		tons TRS per yr		
PB EMISSION FACTOR(with units)= E.F.	N/A			
Source of Emission Factor [1]				
PB CONTROL DEVICE CODE [2]				
Avg. PB CONTROL EFFICIENCY[3]=C.E.		%		
		tons PB per yr		

BASIS FOR CONTROL EFFICIENCIES: ____tested (by EPA Reference Method); ____ tested (other); ____design; ____material balance; ____other (describe on separate sheet).

1. AP-42; ST= Stack Test; CEMS; F = Federal Factor (EPA standard factor from AIRS); O = Other (describe on separate sheet; use subject to DEQ approval)
2. See control device codes listed in Appendix.
3. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. EF is identified to be "with controls").
4. ANNUAL EMISSIONS = ANNUAL THRUPUT x EF x FP x (1/2000) x (100-CE)/100; OZONE EMISSIONS = DAILY THRUPUT x EF x FP x (100-CE)/100

* Due to the fact that this is an emergency generator, the actual hrs run divided by total number of operating days was used (i.e. NOT based on 24 hour/day operation)

** Although gallons/hr is provided here as requested, emission calculations were based on hours operated since emission factors are in units of grams per hp-hr

*** Based on Manufacturer's Data for Volvo 500 kW Diesel generator, Model 500 RD

O[illegible]ON I: EMISSION FACTOR METHOD (c[illegible]ed)

REGISTRATION #: 51-059-0056: 70151 POINT NO. 01-01 through 08-14 (all units) SCC NO. All units

THRUPUT(with units)		
NO. OPERATING DAYS	days	
NO. OPERATING HOURS PER DAY	hours	
DAILY THRUPUT(with units)=thruput /days		
HAP EMISSION FACTOR(with units)=E.F	NA	
Source of Emission Factor [1]		
HAP CONTROL DEVICE CODE [2]		
Avg. HAP CONTROL EFFICIENCY[3]=C.E.	%	
	tons per yr	
HAP EMISSION FACTOR(with units)=E.F.	NA	
Source of Emission Factor [1]		
HAP CONTROL DEVICE CODE [2]		
Avg. HAP CONTROL EFFICIENCY[3]=C.E.	%	
	tons per yr	
HAP EMISSION FACTOR(with units)=E.F.	NA	
Source of Emission Factor [1]		
HAP CONTROL DEVICE CODE [2]		
Avg. HAP CONTROL EFFICIENCY[3]=C.E.	%	
	tons per yr	
HAP EMISSION FACTOR(with units)=E.F.	NA	
Source of Emission Factor [1]		
HAP CONTROL DEVICE CODE [2]		
Avg. HAP CONTROL EFFICIENCY[3]=C.E.	%	
	tons per yr	
HAP EMISSION FACTOR(with units)=E.F.	NA	
Source of Emission Factor [1]		
HAP CONTROL DEVICE CODE [2]		
Avg. HAP CONTROL EFFICIENCY[3]=C.E.	%	
	tons per yr	
HAP EMISSION FACTOR(with units)=E.F.	NA	
Source of Emission Factor [1]		
HAP CONTROL DEVICE CODE [2]		
Avg. HAP CONTROL EFFICIENCY[3]=C.E.	%	
	tons per yr	

BASIS FOR CONTROL EFFICIENCIES: ____tested (by EPA Reference Method); ____ tested (other); ____design; ____material balance; ____other (describe on separate sheet).

1. AP-42; ST= Stack Test; CEMS; F = Federal Factor (EPA standard factor from AIRS); O = Other (describe on separate sheet; use subject to DEQ approval)
2. See control device codes listed in Appendix.
3. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. EF is identified to be "with controls").
4. ANNUAL EMISSIONS = ANNUAL THRUPUT x EF x FP x (1/2000) x (100-CE)/100; OZONE EMISSIONS = DAILY THRUPUT x EF x FP x (100-CE)/100

NOTE: HAP Calculations are included within the VOC calculations, therefore are not captured here

OPTION I: EMISSION FACTOR METHOD (Continued)

STACK NUMBER: 01 **REGISTRATION #:** 51-059-0056; 70151

	ANNUAL	ZONE SENSITIVE (July/August)
STACK HEIGHT (ft)	58	
STACK DIAMETER (ft)	2	
EXIT GAS TEMPERATURE (° F)	120-150	
EXIT GAS VELOCITY (ft per second)	8	
ELEVATION (ft above sea level)	288	
GAS FLOW RATE (cu. ft per minute)	1500	

STACK NUMBER: 02

	ANNUAL	ZONE SENSITIVE (July/August)
STACK HEIGHT (ft)	58	
STACK DIAMETER (ft)	2	
EXIT GAS TEMPERATURE (° F)	120-150	
EXIT GAS VELOCITY (ft per second)	8	
ELEVATION (ft above sea level)	288	
GAS FLOW RATE (cu. ft per minute)	1500	

STACK NUMBER: 03

	ANNUAL	ZONE SENSITIVE (July/August)
STACK HEIGHT (ft)	58	
STACK DIAMETER (ft)	2	
EXIT GAS TEMPERATURE (° F)	120-150	
EXIT GAS VELOCITY (ft per second)	8	
ELEVATION (ft above sea level)	288	
GAS FLOW RATE (cu. ft per minute)	1500	

STACK NUMBER: 04

	ANNUAL	ZONE SENSITIVE (July/August)
STACK HEIGHT (ft)	58	
STACK DIAMETER (ft)	2.5	
EXIT GAS TEMPERATURE (° F)	*	
EXIT GAS VELOCITY (ft per second)	*	
ELEVATION (ft above sea level)	288	
GAS FLOW RATE (cu. ft per minute)	*	

STACK NUMBER: 05

	ANNUAL	ZONE SENSITIVE (July/August)
STACK HEIGHT (ft)	OUT OF SERVICE	
STACK DIAMETER (ft)		
EXIT GAS TEMPERATURE (° F)		
EXIT GAS VELOCITY (ft per second)		
ELEVATION (ft above sea level)		
GAS FLOW RATE (cu. ft per minute)		

* Will have to be determined by stack testing or other method

TION I: EMISSION FACTOR METHOD (c ed)

STACK NUMBER: 06 **REGISTRATION #:** 51-059-0056; 70151

	ANNUAL	OZONE SEASON (June-July-August)
STACK HEIGHT (ft)	58	
STACK DIAMETER (ft)	0.5	
EXIT GAS TEMPERATURE (° F)	*	
EXIT GAS VELOCITY (ft per second)	*	
ELEVATION (ft above sea level)	288	
GAS FLOW RATE (cu. ft per minute)	*	

STACK NUMBER: 07

	ANNUAL	OZONE SEASON (June-July-August)
STACK HEIGHT (ft)	30	
STACK DIAMETER (ft)	0.60	
EXIT GAS TEMPERATURE (° F)	*	
EXIT GAS VELOCITY (ft per second)	*	
ELEVATION (ft above sea level)	288	
GAS FLOW RATE (cu. ft per minute)	*	

STACK NUMBER: 08

	ANNUAL	OZONE SEASON (June-July-August)
STACK HEIGHT (ft)	58	
STACK DIAMETER (ft)	0.67	
EXIT GAS TEMPERATURE (° F)	1035	
EXIT GAS VELOCITY (ft per second)	451	
ELEVATION (ft above sea level)	288	
GAS FLOW RATE (cu. ft per minute)		

STACK NUMBER:

	ANNUAL	OZONE SEASON (June-July-August)
STACK HEIGHT (ft)		
STACK DIAMETER (ft)		
EXIT GAS TEMPERATURE (° F)		
EXIT GAS VELOCITY (ft per second)		
ELEVATION (ft above sea level)		
GAS FLOW RATE (cu. ft per minute)		

STACK NUMBER:

	ANNUAL	OZONE SEASON (June-July-August)
STACK HEIGHT (ft)		
STACK DIAMETER (ft)		
EXIT GAS TEMPERATURE (° F)		
EXIT GAS VELOCITY (ft per second)		
ELEVATION (ft above sea level)		
GAS FLOW RATE (cu. ft per minute)		

*** Will have to be determined by stack testing or other method**

APPENDIX B
NO_x RACT Consent Agreements

NVRO-031-98

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Northern Virginia Regional Office
13901 Crown Court
Woodbridge VA 22193
(703) 583-3800
FAX (703) 583-3801

CONSENT AGREEMENT

WITH

Washington Gas Light Company
6801 Industrial Road
Springfield, Virginia 22151

Registration No. 70151

SECTION A: Purpose

This Agreement establishes a Reasonably Available Control Technology (RACT) standard for Washington Gas Light Company, located in Springfield, Virginia, for the control of nitrogen oxide (NOx) emissions in the Northern Virginia Ozone Nonattainment Area as required by 9 VAC 5-40-310 of the State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution. This RACT standard shall be the basis for NOx emissions control for this plant.

SECTION B: References

Unless the context indicates otherwise, the following words and terms have the meanings assigned to them below:

"Agreement" means this Consent Agreement.

"Board" or "SAPCB" means the State Air Pollution Control Board, a collegiate body of the Commonwealth of Virginia described in § 10.1-1301 of the Code. Particular powers and duties of the Board are described in Section C of this document.

"Code" means the Code of Virginia.

"DEQ" means the Department of Environmental Quality, an agency of the Commonwealth described in § 10.1-1183 of the

Code.

"Director" means the Director of the Department of Environmental Quality. Particular powers and duties of the Director are described in Section C of this document.

"EPA" means the United States Environmental Protection Agency.

"Major Stationary Source" means any stationary source which emits, or has the potential to emit 100 tons per year or more of any pollutant subject to regulation under the federal clean air act, or 50 tons per year or more of volatile organic compounds or nitrogen oxides in ozone nonattainment areas classified as serious in 9 VAC 5-20-204 of the SAPCB Regulations. The area in which the affected facility is located is a nonattainment area classified as serious in 9 VAC 5-20-204 of the SAPCB Regulations.

"New source review program" means a program for the preconstruction review and permitting of new stationary sources or expansions to existing ones in accordance with regulations promulgated to implement the requirements of §§ 110 (a)(2)(C), 165 (relating to permits in prevention of significant deterioration areas) and 173 (relating to permits in nonattainment areas) of the federal Clean Air Act.

"Non-CTG" means a source type for which the EPA has not issued a Control Technique Guideline (CTG), and thus has not established RACT for that source type.

"NOx" means nitrogen oxides as defined by 9 VAC 5-10-20 of the SAPCB Regulations.

"NSCR" means Nonselective Catalytic Reduction.

"Reasonably Available Control Technology" or "RACT" means the lowest emission limit that a particular source is capable of meeting by the application of control technology that is both reasonably available, as well as technologically and economically feasible.

"Regional Director" means the Director of the Northern Virginia Regional Office of the Department of Environmental Quality, 13901 Crown Court, Woodbridge, Virginia 22193.

"SAPCB Regulations" means the State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution.

"SIP" means the State Implementation Plan.

"Theoretical potential to emit" means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. It is based on emissions at design capacity or maximum production and maximum operating hours (8,760 hours per year) before add-on controls, unless the source is subject to state and federally enforceable permit conditions which limit production rates or hours of operation.

"VOC" means volatile organic compounds as defined by 9 VAC 5-10-20 of the SAPCB Regulations.

"Washington Gas", or "affected facility" means Washington Gas Light Company located in Springfield, Virginia which is located in Fairfax County.

SECTION C: Authority

1. Chapter 13 of Title 10.1 of the Code creates the Board and vests in it the authority to supervise and control various aspects of air pollution in the Commonwealth. Among the Board's powers is the authority to promulgate regulations "abating, controlling and prohibiting" air pollution, found in § 10.1-1308 of the Code.

2. Pursuant to its authority, the Board has promulgated the SAPCB Regulations, which first took effect March 17, 1972 and have been periodically amended.

3. Pursuant to § 10.1-1307 D of the Code, the Board has the authority to issue orders to diminish or abate the causes of air pollution and to enforce its regulations. Orders of the Board are enforceable pursuant to §§ 10.1-1316 and 10.1-1320 of the Code.

4. The Director is the executive officer of the Board. Under § 10.1-1307.2 A of the Code, the Director is to perform those duties required of him by the Board. Additionally under § 10.1-1307.3 of the Code, the Director has such powers to supervise, administer and enforce the provisions of Chapter 13 of Title 10.1 of the Code, as well as the regulations and orders of the Board, as are conferred upon him by the Board. The powers and duties conferred and imposed upon the Director under §§ 10.1-1307.2 and 10.1-1307.3 of the Code are continued under § 10.1-1185 of the Code.

5. Under § 10.1-1307.2 B of the Code, the Director may be

vested with the authority of the Board when it is not in session, subject to such regulations or delegation as may be prescribed by the Board. 9 VAC 5-20-130 of the SAPCB Regulations contains the Delegation of Authority from the Board to the Director. In subsection C 1 of 9 VAC 5-20-130 the Director is given the authority, with some exceptions, to act for the Board when it is not in session and to issue consent orders and emergency special orders.

SECTION D: Findings

1. Washington Gas operates a natural gas powered cogeneration facility, consisting of six (6) generators and three (3) boilers, in Springfield, Virginia which is located in Fairfax County.

2. 9 VAC 5-40-300 and 9 VAC 5-40-310 of the SAPCB Regulations requires RACT for all non-CTG major stationary sources with potential VOC emissions of 25 tons per year or greater and NOx emissions of 50 tons per year or greater in the Northern Virginia Ozone Nonattainment Area, which includes the Cities of Alexandria, Fairfax, Falls Church, Manassas, Manassas Park, and the counties of Arlington, Fairfax, Loudoun, Prince William and Stafford.

3. Washington Gas was determined to be a potential non-CTG major stationary source of NOx emissions in the Northern Virginia Ozone Nonattainment Area.

4. On May 30, 1995, the Board notified Washington Gas of its requirement to develop a RACT standard for NOx emissions from the affected facility.

5. Washington Gas submitted a proposed RACT determination dated June 28, 1995, to the DEQ on June 30, 1995.

6. The DEQ provided comments to Washington Gas, regarding their proposed RACT determination, on July 10, 1995.

7. Washington Gas submitted a RACT analysis dated October 10, 1995, to the DEQ on October 24, 1995.

8. The DEQ provided comments to Washington Gas, regarding their RACT analysis, on December 20, 1995.

9. A meeting between DEQ and Washington Gas was held January 19, 1996, in order to discuss Washington Gas' RACT analysis.

10. Washington Gas submitted a revised, January 31, 1996, RACT analysis to the DEQ on February 1, 1996.

11. In a March 6, 1996, letter to Washington Gas, the DEQ gave tentative approval of the revised January 31, 1996, RACT analysis provided that a revised Section 12.0 is incorporated into the document. DEQ requested a copy of revised Section 12.0 prior to the final RACT analysis being submitted to DEQ.

12. In a March 26, 1996, letter to Washington Gas, the DEQ gave approval of revised Section 12.0. DEQ requested copies of the final approved RACT analysis be submitted to DEQ.

13. DEQ received Washington Gas' final RACT analysis on April 3, 1996.

14. In a July 11, 1996, newspaper advertisement, the public was notified of DEQ's intent to hold an August 15, 1996, public hearing concerning Washington Gas' proposed RACT determination.

15. DEQ held a public hearing on August 15, 1996, in order to obtain comments concerning Washington Gas' proposed RACT determination. No comments were submitted within the defined comment period.

16. DEQ sent copies of the Consent Agreement to Washington Gas on December 5, 1996, for signature.

17. Upon DEQ's signature of January 13, 1997, the Consent Agreement became affective.

18. In a February 28, 1997, meeting between DEQ and Washington Gas, Washington Gas representatives informed DEQ that the installation of the L-E technology was not working as expected and that different technologies would need to be evaluated.

19. In an April 14, 1997, phone conversation between DEQ and Washington Gas, DEQ requested that Washington Gas provide a time line for the submittal of the revised RACT analysis and the completion of the project.

20. DEQ received Washington Gas' proposed time line on April 21, 1997.

21. DEQ approved Washington Gas' proposed time line in a letter dated April 28, 1997.

22. DEQ received Washington Gas' new RACT analysis on June 5, 1997.

23. The DEQ provided comments to Washington Gas regarding the submitted RACT analysis on June 27, 1997.

24. DEQ received Washington Gas' revised RACT analysis on July 18, 1997.

25. The DEQ provided conditional approval to Washington Gas regarding the revised RACT analysis on July 25, 1997.

26. The following cogeneration facility pre-RACT uncontrolled emissions (theoretical potential to emit) are summarized in the RACT analysis:

    a. Uncontrolled NOx emissions from the facility's six (6) 930 horsepower Caterpillar G399 engines are estimated to be 807.6 tons per year.

    b. Uncontrolled NOx emissions from the facility's three (3) gas-fired boilers, each with a maximum heat input capacity of 10.46 million Btu/hr, are estimated to be 19.2 tons per year.

    c. Total uncontrolled NOx emissions from the affected facility are estimated to be 826.8 tons per year.

SECTION E: Agreement

Accordingly, the Board and Washington Gas agree that:

1. This Consent Agreement supersedes your Consent Agreement signed into effect on January 13, 1997, and defined by DEQ document number NVRO-388-96.

2. RACT for the cogeneration facility is the NOx emission rate of 2 grams per horsepower-hour. The proposed emission rate shall be obtained by the installation of Nonselective Catalytic Reduction technology (NSCR) and automatic air/fuel ratio controllers on the six (6) 930 horsepower engines.

3. Initial stack testing shall be conducted for nitrogen oxides emissions from a minimum of one (1) and a maximum of two (2) of the six (6) 930 horsepower Caterpillar G399 engine stacks. The actual unit(s) tested shall be selected by the Regional Director. Tests shall be conducted and reported and data reduced as set forth in 9 VAC 5-50-30 of State Regulations.

During all tests, the engine(s) shall be required to be operated at a minimum of 80% of their maximum rated output capacity. The details of the tests are to be arranged with the Regional Director. Washington Gas shall submit a test protocol at least thirty (30) days prior to testing. Two (2) copies of the test results shall be submitted to the Regional Director within 60 days after test completion.

4. Washington Gas shall determine the surrogate parameters, differential pressure and temperature, required to ensure continuous compliance with the defined RACT standard. The surrogate parameters shall be determined by utilization of both stack test and portable analyzer data. The details of the surrogate parameter development and testing methods are to be arranged with the Regional Director. Two (2) copies of the results shall be submitted to the Regional Director within 60 days after test completion. As a minimum, surrogate parameters shall be re-evaluated, using portable analyzers, at a minimum of once in every 24 month period. Additionally, the surrogate parameter monitoring devises shall be calibrated and certified on an annual basis.

5. Washington Gas shall submit an annual report to the Regional Director detailing all non-compliance conditions. Washington Gas shall, at a minimum, keep a daily log which documents the temperature and pressure differential across the catalyst beds. The daily log shall provide sufficient information to demonstrate compliance with the conditions of this Agreement. Additionally, an annual report demonstrating compliance with all RACT requirements shall be submitted to the Regional Director, Northern Virginia DEQ Office within 30 days after the end of calendar year. Detailed documentation of the daily log shall be maintained at the facility for the most recent five (5) years and made available to the DEQ upon reasonable notice at any time.

6. Washington Gas shall comply with all applicable SAPCB Regulations including the requirements for monitoring, notification, recordkeeping, reporting, maintenance, and malfunction.

7. At any time in the future, should Washington Gas plan any modifications (in the context of the new source review program) of the affected facility covered by this Agreement, Washington Gas shall have the right to

apply to the Board for a new source review permit and the Board may consent to such modifications provided such modifications will meet all of the new source review permit program regulatory requirements in existence at that time.

8. The Board may modify, rewrite, or amend this Agreement with the consent of Washington Gas, for good cause shown by Washington Gas, or on its own motion provided approval of the changes is accomplished in accordance with SAPCB regulations, the Administrative Process Act (§ 9-6.14:1 et. seq.) and 40 CFR Part 51 (Requirements for Preparation, Adoption, and Submittal of Implementation Plans).

9. Upon the terms and conditions of this Agreement being incorporated into a federally enforceable operating permit, enforcement shall take place through the operating permit program in lieu of this Agreement. It shall be noted that the preceding statement does not preclude DEQ's right to take enforcement action through this document if it deems necessary.

10. So long as this Agreement remains in effect, Washington Gas waives the right to any hearing pursuant to §§ 9-6.14:11 and 9-6.14:12 of the Code and to judicial review of any issue of fact or law contained herein. Nothing herein, however, shall be construed as a waiver of the right to a hearing or to judicial review of any action taken by the Board to enforce this Agreement.

11. Failure by Washington Gas to comply with any of the terms of this Agreement shall constitute a violation of an Order of the Board. Nothing herein shall waive the initiation of appropriate enforcement actions or the issuance of additional orders as appropriate by the Board as a result of such violations. Nothing herein shall affect appropriate enforcement actions by any other federal, state, or local regulatory authority.

12. Washington Gas declares it has received fair and due process under the Administrative Process Act (§ 9-6.14:1 et. seq.).

13. This Agreement shall become effective upon signature by both parties and shall continue in effect indefinitely or until otherwise terminated by the Board.

The foregoing Consent Agreement has been executed on behalf of the STATE AIR POLLUTION CONTROL BOARD of the COMMONWEALTH OF VIRGINIA and on behalf of Washington Gas Light Company, each by its duly authorized representatives, or self, on the dates indicated below.

DEPARTMENT OF ENVIRONMENTAL QUALITY
OF THE COMMONWEALTH OF VIRGINIA

4/3/98
(date)

BY: John M. Daniel Jr.
for Thomas L. Hopkins
Director

WASHINGTON GAS LIGHT COMPANY

March 26, 1998
(date)

BY: Richard J. Cook
Richard J. Cook
Vice President,
Operations Technical Support

STATE OF Virginia
CITY/COUNTY OF Fairfax

The foregoing instrument was acknowledged before me this 26th day of March, 1998, by Richard J. Cook, Vice President, Operations Technical Support, of Washington Gas Light Company, a Virginia Corporation, on behalf of the Corporation.

My commission expires August 31, 2000.

Karen R. Moore
Notary Public

NVRO-047-98

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Northern Virginia Regional Office
13901 Crown Court
Woodbridge, VA 22193
(703) 583-3800
FAX (703) 583-3801

CONSENT AGREEMENT

WITH

Washington Gas Light Company
6801 Industrial Road
Springfield, Virginia 22151

Registration No. 70151

SECTION A: Purpose

This Agreement establishes a compliance schedule for the installation and testing of Nonselective Catalytic Reduction control equipment required by the Reasonably Available Control Technology (RACT) standard for Washington Gas Light Company, located in Springfield, Virginia, for the control of nitrogen oxide (NOx) emissions in the Northern Virginia Ozone Nonattainment Area as required by 9 VAC 5-40-310 of the State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution.

SECTION B: References

Unless the context indicates otherwise, the following words and terms have the meanings assigned to them below:

"Agreement" means this Consent Agreement.

"Board" or "SAPCB" means the State Air Pollution Control Board, a collegiate body of the Commonwealth of Virginia described in § 10.1-1301 of the Code. Particular powers and duties of the Board are described in Section C of this document.

"Code" means the Code of Virginia.

"DEQ" means the Department of Environmental Quality, an

agency of the Commonwealth described in § 10.1-1183 of the Code.

"Director" means the Director of the Department of Environmental Quality. Particular powers and duties of the Director are described in Section C of this document.

"EPA" means the United States Environmental Protection Agency.

"Major Stationary Source" means any stationary source which emits, or has the potential to emit 100 tons per year or more of any pollutant subject to regulation under the federal clean air act, or 50 tons per year or more of volatile organic compounds or nitrogen oxides in ozone nonattainment areas classified as serious in 9 VAC 5-20-204 of the SAPCB Regulations. The area in which the affected facility is located is a nonattainment area classified as serious in 9 VAC 5-20-204 of the SAPCB Regulations.

"New source review program" means a program for the preconstruction review and permitting of new stationary sources or expansions to existing ones in accordance with regulations promulgated to implement the requirements of §§ 110 (a)(2)(C), 165 (relating to permits in prevention of significant deterioration areas) and 173 (relating to permits in nonattainment areas) of the federal Clean Air Act.

"Non-CTG" means a source type for which the EPA has not issued a Control Technique Guideline (CTG), and thus has not established RACT for that source type.

"NOx" means nitrogen oxides as defined by 9 VAC 5-10-20 of the SAPCB Regulations.

"NSCR" means Nonselective Catalytic Reduction.

"Reasonably Available Control Technology" or "RACT" means the lowest emission limit that a particular source is capable of meeting by the application of control technology that is both reasonably available, as well as technologically and economically feasible.

"Regional Director" means the Director of the Northern Virginia Regional Office of the Department of Environmental Quality, 13901 Crown Court, Woodbridge, Virginia 22193.

"SAPCB Regulations" means the State Air Pollution Control Board Regulations for the Control and Abatement of Air

Pollution.

"Theoretical potential to emit" means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. It is based on emissions at design capacity or maximum production and maximum operating hours (8,760 hours per year) before add-on controls, unless the source is subject to state and federally enforceable permit conditions which limit production rates or hours of operation.

"VOC" means volatile organic compounds as defined by 9 VAC 5-10-20 of the SAPCB Regulations.

"Washington Gas", or "affected facility" means Washington Gas Light Company located in Springfield, Virginia which is located in Fairfax County.

SECTION C: Authority

1. Chapter 13 of Title 10.1 of the Code creates the Board and vests in it the authority to supervise and control various aspects of air pollution in the Commonwealth. Among the Board's powers is the authority to promulgate regulations "abating, controlling and prohibiting" air pollution, found in § 10.1-1308 of the Code.

2. Pursuant to its authority, the Board has promulgated the SAPCB Regulations, which first took effect March 17, 1972 and have been periodically amended.

3. Pursuant to § 10.1-1307 D of the Code, the Board has the authority to issue orders to diminish or abate the causes of air pollution and to enforce its regulations. Orders of the Board are enforceable pursuant to §§ 10.1-1316 and 10.1-1320 of the Code.

4. The Director is the executive officer of the Board. Under § 10.1-1307.2 A of the Code, the Director is to perform those duties required of him by the Board. Additionally under § 10.1-1307.3 of the Code, the Director has such powers to supervise, administer and enforce the provisions of Chapter 13 of Title 10.1 of the Code, as well as the regulations and orders of the Board, as are conferred upon him by the Board. The powers and duties conferred and imposed upon the Director under §§ 10.1-1307.2 and 10.1-1307.3 of the Code are continued under § 10.1-1185 of the Code.

5. Under § 10.1-1307.2 B of the Code, the Director may be vested with the authority of the Board when it is not in session, subject to such regulations or delegation as may be prescribed by the Board. 9 VAC 5-20-130 of the SAPCB Regulations contains the Delegation of Authority from the Board to the Director. In subsection C 1 of 9 VAC 5-20-130 the Director is given the authority, with some exceptions, to act for the Board when it is not in session and to issue consent orders and emergency special orders.

SECTION D: Findings

1. Washington Gas operates a natural gas powered cogeneration facility, consisting of six (6) generators and three (3) boilers, in Springfield, Virginia which is located in Fairfax County.

2. 9 VAC 5-40-300 and 9 VAC 5-40-310 of the SAPCB Regulations requires RACT for all non-CTG major stationary sources with potential VOC emissions of 25 tons per year or greater and NOx emissions of 50 tons per year or greater in the Northern Virginia Ozone Nonattainment Area, which includes the Cities of Alexandria, Fairfax, Falls Church, Manassas, Manassas Park, and the counties of Arlington, Fairfax, Loudoun, Prince William and Stafford.

3. Washington Gas was determined to be a potential non-CTG major stationary source of NOx emissions in the Northern Virginia Ozone Nonattainment Area.

4. On May 30, 1995, the Board notified Washington Gas of its requirement to develop a RACT standard for NOx emissions from the affected facility.

5. In a March 26, 1996, letter to Washington Gas, the DEQ gave approval of Washington Gas's RACT analysis.

6. In a December 1996 consent agreement, document number NVRO-388-96, between DEQ and Washington Gas, it was determined that the RACT standard for Washington Gas' cogeneration facility is the installation of Low Emission Combustion technology (L-E) on the six (6) 930 horsepower engines.

7. Upon DEQ's signature of January 13, 1997, the Consent Agreement became affective.

8. In a February 28, 1997, meeting between DEQ and Washington Gas, Washington Gas representatives informed DEQ that the installation of the L-E technology was not working as expected and that different technologies would need to be evaluated.

9. The DEQ provided conditional approval to Washington Gas regarding the revised RACT analysis on July 25, 1997.

10. In a March 1998 consent agreement, document number NVRO-031-98, between DEQ and Washington Gas, it was determined that RACT for the cogeneration facility is the NOx emission rate of 2 grams per horsepower-hour. The proposed emission rate shall be obtained by the installation of Nonselective Catalytic Reduction technology (NSCR) and automatic air/fuel ratio controllers on the six (6) 930 horsepower engines.

SECTION E: Agreement

Accordingly, the Board and Washington Gas agree that:

1. This Consent Agreement supersedes your Consent Agreement signed into effect on January 13, 1997, and defined by DEQ document number NVRO-389-96.

2. The installation of Nonselective Catalytic Reduction technology (NSCR) and automatic air/fuel ratio controllers on the six (6) 930 horsepower engines shall be completed within 180 days of this agreement becoming effective. An extension may be granted by the Regional Director, upon the satisfactory demonstration that the extension is justified.

3. Initial stack testing shall be conducted for nitrogen oxides emissions from a minimum of one (1) and a maximum of two (2) of the six (6) 930 horsepower Caterpillar G399 engine stacks within 60 days of the completion of the defined NSCR installation. The actual unit(s) tested shall be selected by the Regional Director. Tests shall be conducted and reported and data reduced as set forth in 9 VAC 5-50-30 of State Regulations. During all tests, the engine(s) shall be required to be operated at a minimum of 80% of their maximum rated output capacity. The details of the tests are to be arranged with the Regional Director. Washington Gas shall submit a test protocol at least thirty (30) days prior to testing. Two (2) copies of the test results shall be submitted to the Regional Director within 60 days after test completion.

4. Washington Gas shall determine the surrogate parameters, differential pressure and temperature, required to ensure continuous compliance with the defined RACT standard. The surrogate parameters shall be determined by utilization of both stack test and portable analyzer data. The details of the surrogate parameter development and testing methods are to be arranged with the Regional Director. Two (2) copies of the results shall be submitted to the Regional Director within 60 days after test completion. As a minimum, surrogate parameters shall be re-evaluated, using portable analyzers, at a minimum of once in every 24 month period. Additionally, the surrogate parameter monitoring devises shall be calibrated and certified on an annual basis.

5. The Board may modify, rewrite, or amend this Agreement with the consent of Washington Gas, for good cause shown by Washington Gas, or on its own motion provided such modifications will meet all regulatory requirements in existence at that time.

6. So long as this Agreement remains in effect, Washington Gas waives the right to any hearing pursuant to §§ 9-6.14:11 and 9-6.14:12 of the Code and to judicial review of any issue of fact or law contained herein. Nothing herein, however, shall be construed as a waiver of the right to a hearing or to judicial review of any action taken by the Board to enforce this Agreement.

7. Failure by Washington Gas to comply with any of the terms of this Agreement shall constitute a violation of an Order of the Board. Nothing herein shall waive the initiation of appropriate enforcement actions or the issuance of additional orders as appropriate by the Board as a result of such violations. Nothing herein shall affect appropriate enforcement actions by any other federal, state, or local regulatory authority.

8. Washington Gas declares it has received fair and due process under the Administrative Process Act (§ 9-6.14:1 et. seq.).

9. This Agreement shall become effective upon signature by both parties and shall continue in effect until all conditions have been met or until otherwise terminated by the Board.

The foregoing Consent Agreement has been executed on behalf of the STATE AIR POLLUTION CONTROL BOARD of the COMMONWEALTH OF VIRGINIA and on behalf of Washington Gas Light Company, each by its duly authorized representatives, or self, on the dates indicated below.

DEPARTMENT OF ENVIRONMENTAL QUALITY
OF THE COMMONWEALTH OF VIRGINIA

4/3/98
(date)

BY: John M. Dennis
for Thomas L. Hopkins
Director

WASHINGTON GAS LIGHT COMPANY

March 26, 1998
(date)

BY: Richard J. Cook
Richard J. Cook
Vice President,
Operations Technical Support

STATE OF Virginia
CITY/COUNTY OF Fairfax

The foregoing instrument was acknowledged before me this 26th day of March, 1998, by Richard J. Cook, Vice President, Operations Technical Support, of Washington Gas Light Company, a Virginia Corporation, on behalf of the Corporation.

My commission expires August 31, 2000.

Karen M. Moore
Notary Public

APPENDIX C
NO_x RACT Parametric Monitoring Plan

Washington Gas

6801 Industrial Road
Springfield, Virginia 22151

RECEIVED
JUN 14 1999
Northern VA. Region
Dept. of Env. Quality

11 June 1999

Mr. Terry J. Godar, P.E.
Air Permit Manager
Virginia Department of Environmental Quality
13901 Crown Court
Woodbridge, Virginia 22193

Dear Mr. Godar:

Attached is our revised parametric monitoring plan for our Springfield Operations Center, registration number 70151. If you have any questions or need any additional information, please call me at (703) 750-5558 or Robert Clark at (703) 750-5972.

Sincerely,

Mary Jean Brady
Area Head,
Environment & Quality Assurance

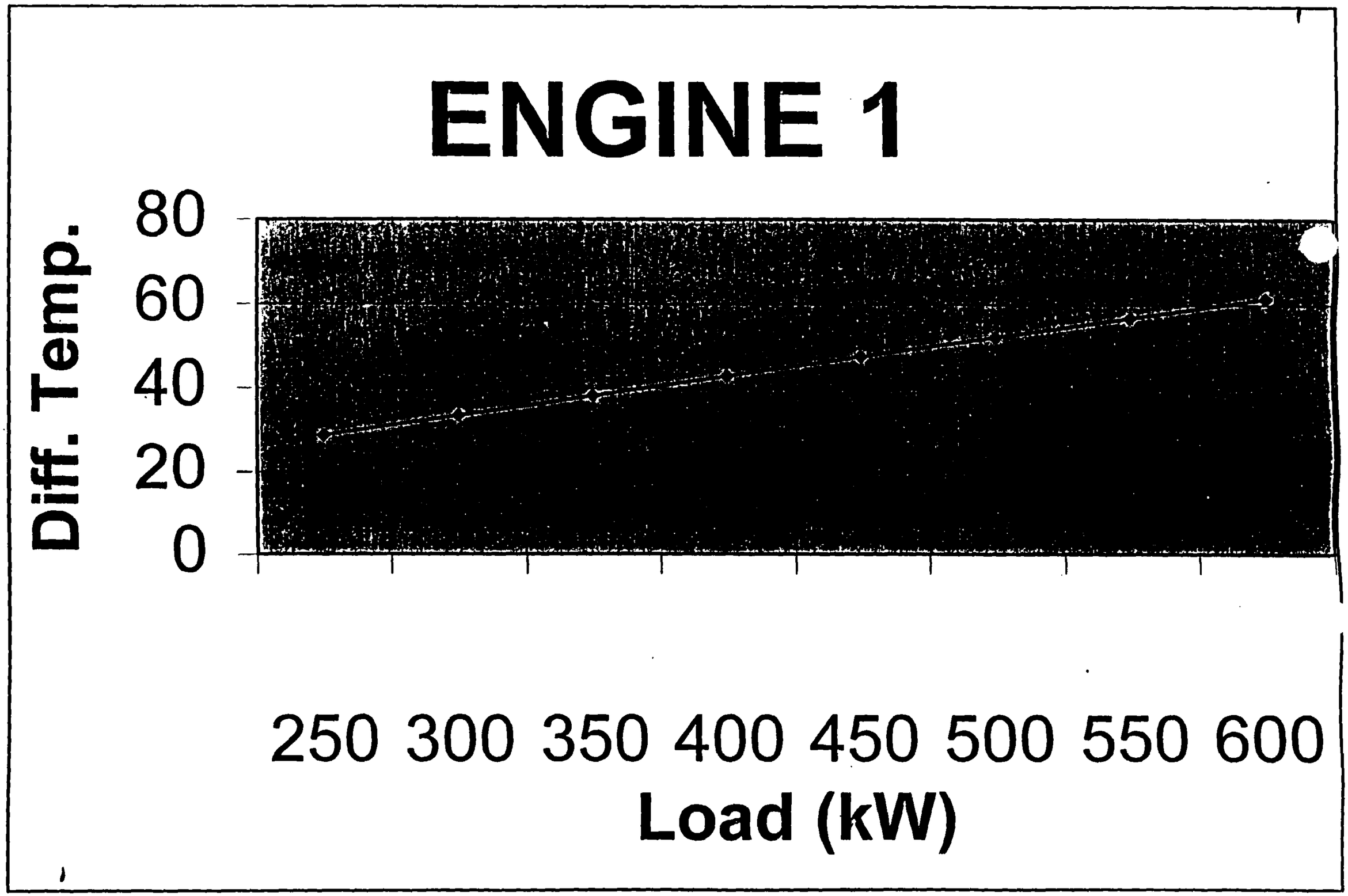
Washington Gas will take daily temperature and pressure readings on each operating engine. Differential pressure readings will be used primarily to determine when the catalyst beds have exhausted or fouled, and secondarily to assess the engine's performance. If the differential pressure observed is below 1.5 inches of water column, Washington Gas will begin troubleshooting the system to determine the cause of the "short circuiting" and the engine will not be used for primary production until the problem is solved. If the differential pressure observed across the catalyst bed is above the differential pressure curve, the following remedial actions will be undertaken.

1) Measure the differential pressure with a calibrated gauge with connections that are clear of any obstructions, condensation, etc.
2) If the pressure is still in excess of the indicated value, use the portable analyzer to measure the NOx emissions to ensure that the pre/post catalyst composition is correct. If NOx emissions are greater than 550 ppm, perform engine diagnostics to include the catalyst system. If emissions are less than 550 ppm, call Johnson Matthey for consultation.
3) Adjust engine's air to fuel ratio and re-measure the differential pressure and temperature. Re-measure NOx emissions. If pressure is still excessive, continue engine diagnostics and make necessary repairs. (Only if emissions are greater than 550 ppm)
4) Washington Gas will not use the engine for primary production (except during engine diagnostics) until the differential pressure is below the desired value.

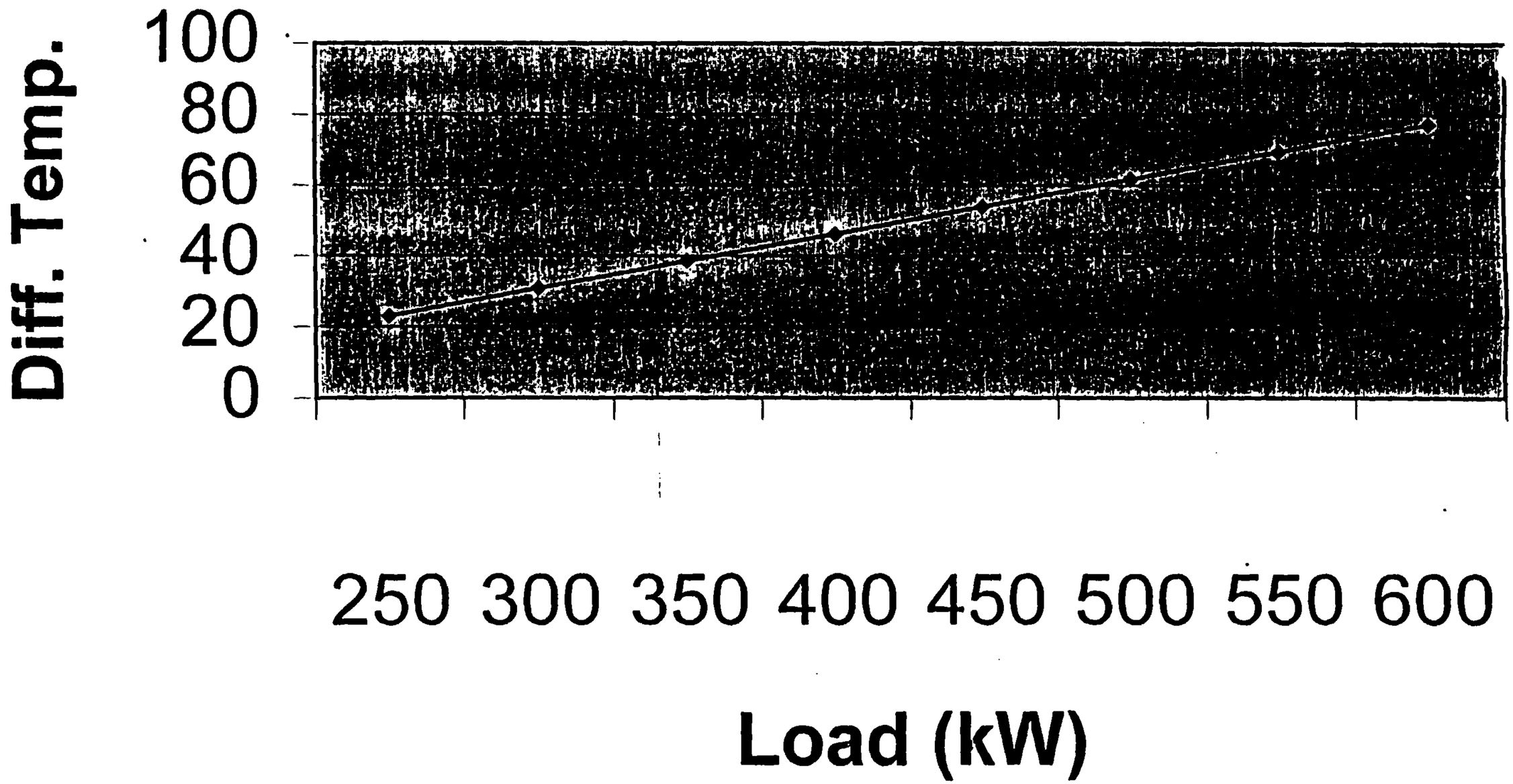
Differential temperature readings will provide the means for determining whether or not the reaction within the catalyst is acceptable. If the differential temperature observed across the catalyst bed is below the temperature curve, the following remedial actions will be undertaken.

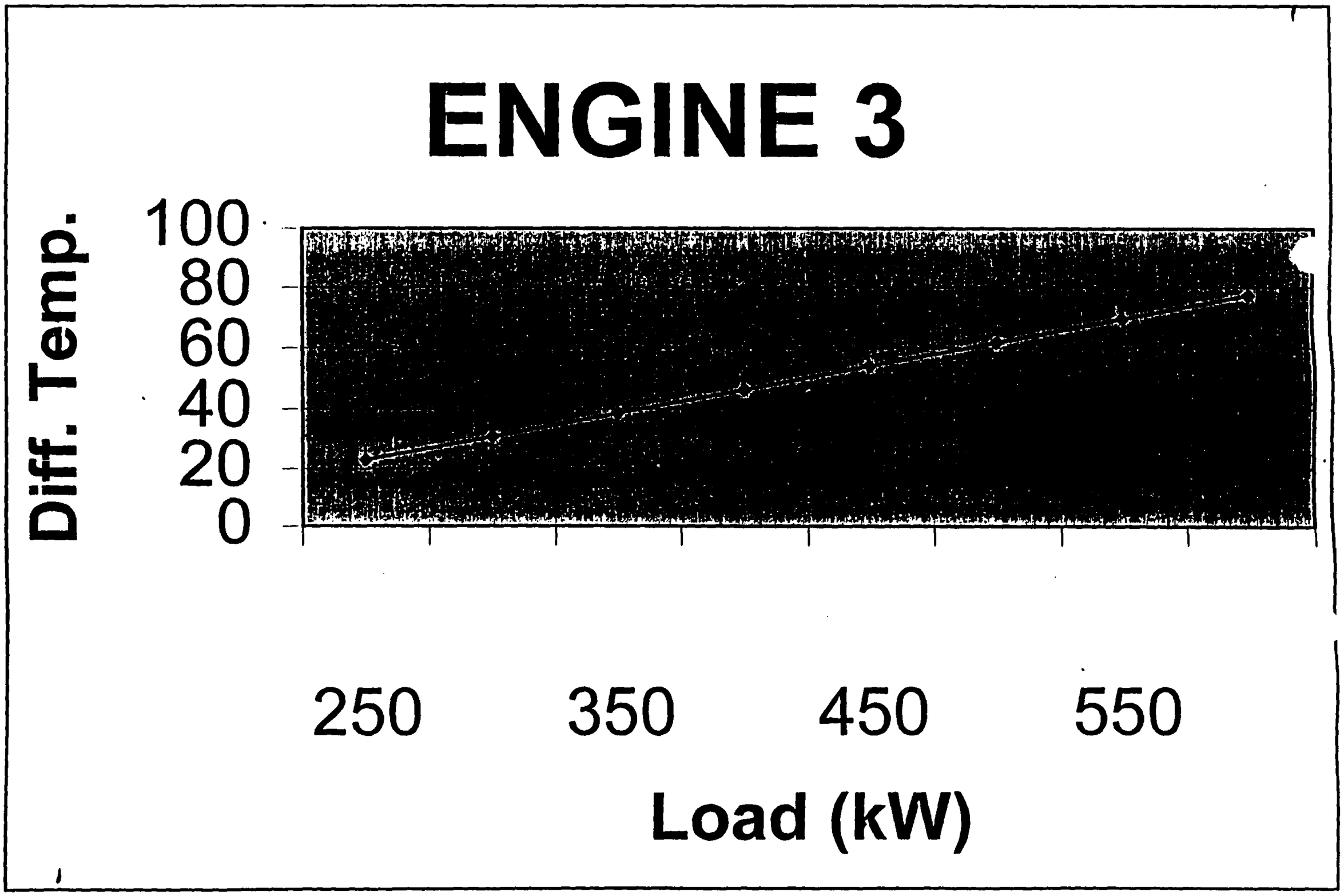
1) Verify that all thermocouple wiring and connections are secure and re-check the differential temperature.
2) If temperature is still below the desired value, use the portable analyzer to measure the NOx emissions to ensure that the pre/post catalyst composition is correct. If NOx emissions are greater than 550 ppm, perform engine diagnostics to include the catalyst system.
3) Adjust the engine's air-fuel ratio and re-measure the differential temperature. If the temperature remains below the curve, continue to troubleshoot the engine and make necessary repairs.
4) Washington Gas will not use the engine for primary production (except during engine diagnostics) until the differential temperature is above the desired value.

In addition to the daily readings, Washington Gas will verify the differential temperature curves for each of the six engines every six months, using the portable analyzer. The curves will be verified at 400, 500, and 600 kW. If it is necessary to adjust the curve either up or down, written documentation will be forwarded to the DEQ within 60 days for review and/or comments.

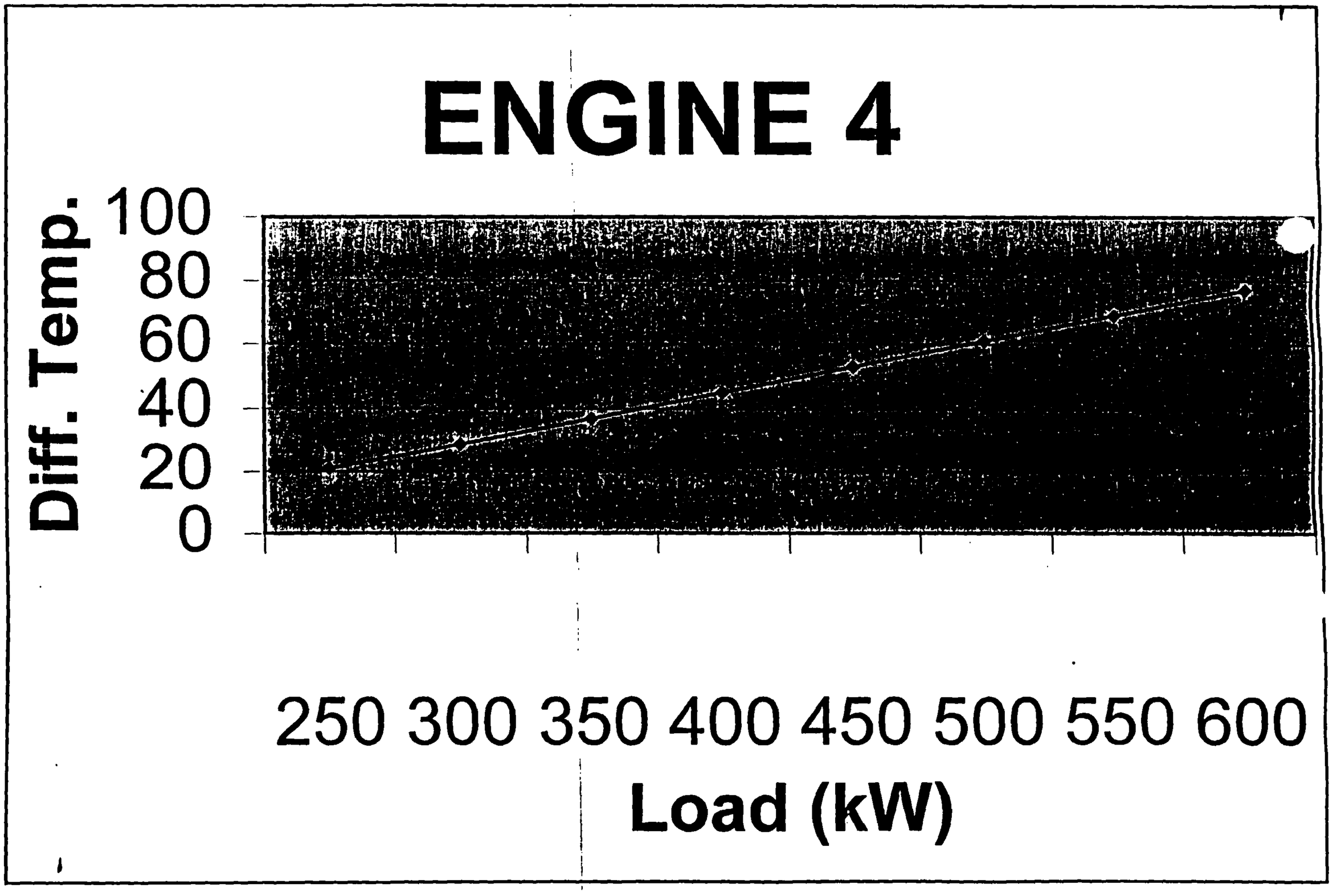

ENGINE 1
Diff. Temp.
80
60
40
20
0
250 300 350 400 450 500 550 600
Load (kW)

ENGINE 2

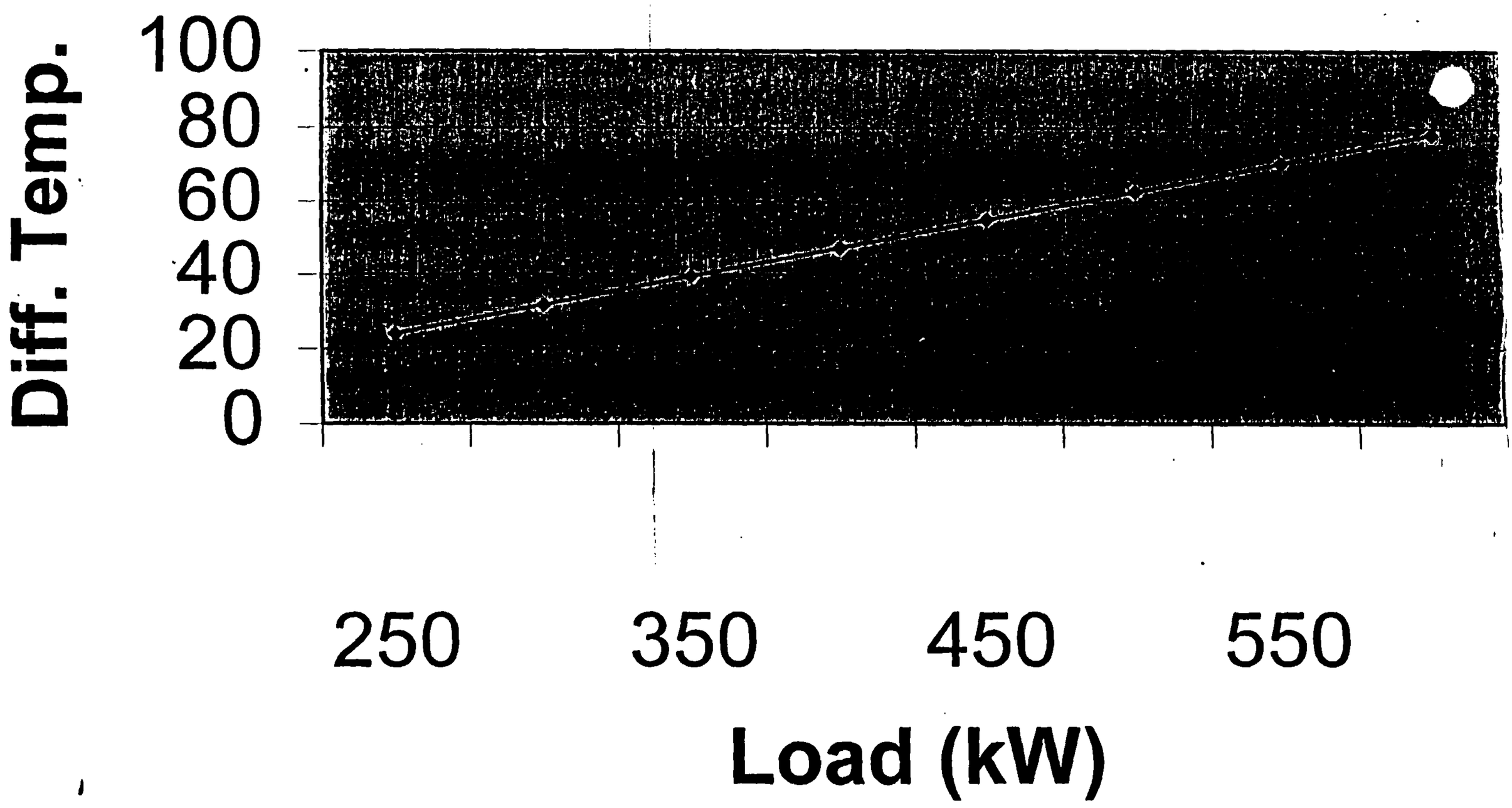

Diff. Temp.
100
80
60
40
20
0
250 300 350 400 450 500 550 600
Load (kW)


ENGINE 3
Diff. Temp.
100
80
60
40
20
0
250
350
450
550
Load (kW)

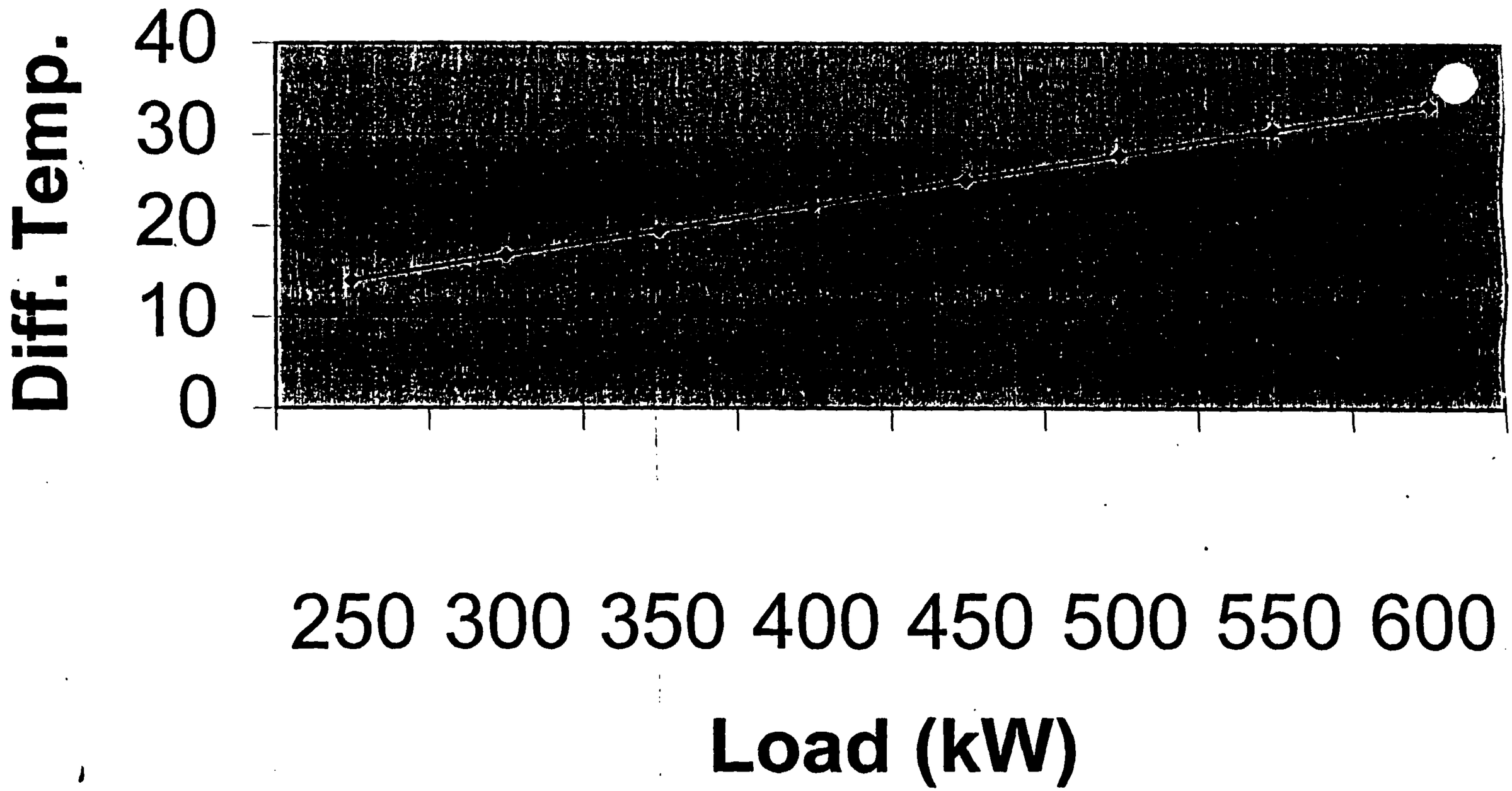
ENGINE 4


Diff. Temp.
100
80
60
40
20
0
250 300 350 400 450 500 550 600
Load (kW)

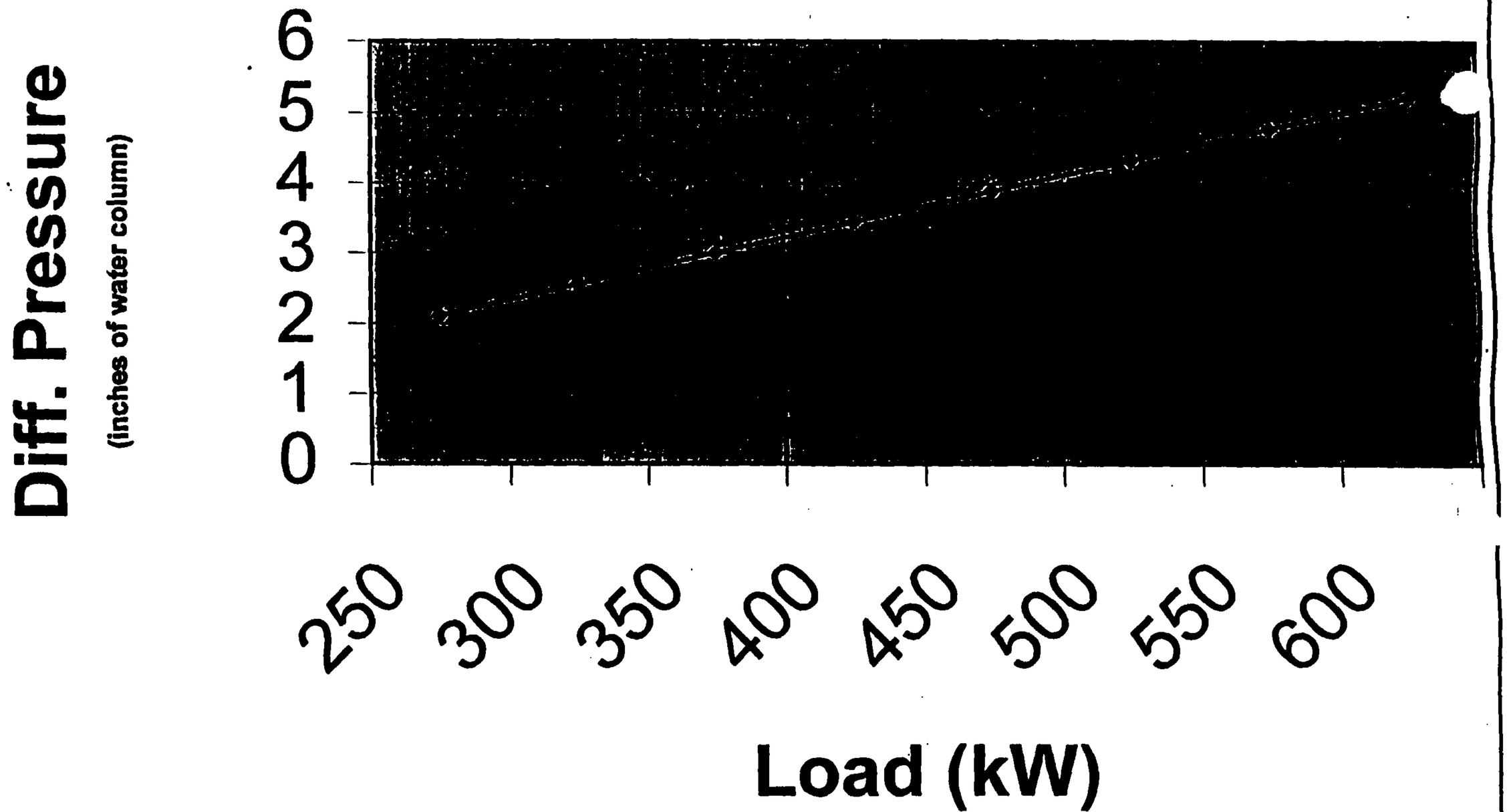
ENGINE 5



ENGINE 6



Diff. Pressure vs. Loading



OCR

The following pages contain the Optical Character Recognition text of the preceding scanned images.

COMMONWEALTH of VIRGINIA
DEPARTMENTOFENVIRONMENTAL QUALITY
Northern Virginia Regional Office
James S. Gilmore, III 13901 Crown Court Dennis H. Treacy
Govemor Woodbridge, VA 22193-1453 Director
(703)583-3800 fax (703)583-3801
John Paul Woodiey, Jr. http://www.deq.state.va.us Gregory L. Clayton
Secretary of Natural Resources Regional Dirmor

COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Northern Virginia Regional Office

STATEMENT OF LEGAL AND FACTUAL BASIS
Washington Gas Springfield Operations Center
Springfield, Virginia
Permit No. NVRO70151

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, Washington Gas has applied for a Title V Operating Permit for its Springfield Operations Center (Cogeneration Plant). The Department has reviewed the application and has prepared a Title V Operating Permit.

Engineer/Permit Contact: Date: November 19, 2001
Christopher D. Meoli
(703) 583-3842

Air Permit Manager: M. Date: November 19, 2001
Terry Darton

Regional Permit Manager: Date: November 19, 2001
Charles D. Forbes.

FACILITY INFORMATION

Permiftee
Washington Gas
6801 Industrial Road
Springfield, VA. 22151

Facili
Springfield Operations Center
6801 Industrial Road
Springfield, VA. 22151

AIRS ID No. 51-059-0056

SOURCE DESCRIPTION

SIC Code: 4924 - Natural Gas Distribution

All electricity, space and water heating, and air conditioning used at the Spr ingfield Operations Center is produced at a Cogeneration Plant located on site. The Cogeneration Plant consists of six Caterpillar generators, each ddven by a natural gas-fired engine rated at a nameplate capacity of 930 horsepower (857 hp de-rated), and three natural gas-fired Clea ver Brooks heat recovery boilers, each rated at 10.46 million BTU per hour. The units are con figured such that two generators are linked to one boiler resulting in three sets of two generat ors and one boiler. The exhaust gases from each set of two generators are sent to a single boiler for recovery of heat and eventual exit through a single boiler stack. Each generator exhaust column is equipped with a Johnson Matthey Catalytic Converter to control oxides of nitro gen. Auxiliary equipment consists of a natural gas-fired Hitachi Chiller, rated at 9.6 millio n BTU per hour, a diesel-fired Cummins Emergency Generator rated at 268 horsepower and a diesel-fired Volvo Emergency Generator rated 749 horsepower.

The facility is a Title V major source of nitrogen oxides (NO.J and carbon mon oxide (CO), and is a PSD major source for CO. This source is located in a Fairfax County Virgini a, which is part of the Northern Virginia Ozone Nonattainment Area, and is classified as Serious n onaffainment for ozone. As a result, the source is a nonattainment major source for NO, The co unty and region is in aftainment with the National Ambient Air Quality Standards (NAAQS) for a ll other criteria pollutants. The source has never been issued a new source review permit but i s currently operating under the authority of two Consent Agreements, dated and signed by D EQ on April 3, 1998. The Consent Agreements establish Reasonably Available Control Technolog

y (RACT) for
NO,, and have been approved by the Environmental Protection Agency (EPA) and i
ncorporated
into Virginia's State Implementation Plan (SIP).

COMPLIANCE STATUS

The facility is inspected once per year by the Virginia DEQ. The last inspection was conducted on July 12, 2001. The facility was determined to be in compliance with RACT and all other requirements.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

The emissions units at this facility consist of the following:

Table 1. Significant Emission Units at Springfield Operations Center

Emission Stack Size/Rated Pollution Control Pollutant Applicable
Unit ID ID Emission Unit Description Capacity' Device (PCD) PCD ID Controlled
Permit Date
Description
Fuel Burn ng Equipment
Caterpillar Generator No. 1, Johnson Matthey NO,, RACT

01 01 Model G399 engine, natural 930 Catalytic Converter Oil NQ, Consent
gas-fired horsepower on Emission Unit 01 Agreement dated
(began operation in 1969) exhaust April 3, 1998
Caterpillar Generator No. 2, Johnson Matthey NQ, RACT

02 01 Model G399 engine, natural 930 Catalytic Converter 012 NQ, Consent
gas-fired horsepower on Emission Unit 02 Agreement dated
(began operation in 1969) exhaust April 3, 1998
Cleaver Brooks Boiler No. 10.46
03 01 1, natural gas-fired --- --- --- None
(began operation in 1969) MMBtu/hr

Caterpillar Generator No. 3, Johnson Matthey NQ, RACT

04 02 Model G399 engine, natural 930 Catalytic Converter 013 NQ, Consent
gas-fired horsepower on Emission Unit 04 Agreement dated
(began operation in 1969) exhaust April 3, 1998
Caterpillar Generator No. 4, Johnson Matthey NQ, RACT

05 02 Model G399 engine, natural 930 Catalytic Converter 014 NQ, Consent
gas-fired horsepower on Emission Unit 05 Agreement dated
(began operation in 1969) exhaust April 3, 1998

Emission Stack Size/Rated Pollution Control Pollutant Applicable
Unit ID ID Emission Unit Description Capacity' Device (PCD) PCD ID Controlled
Permit Date -
Description
Cleaver Brooks Boiler No. 10.46
06 02 2, natural gas-fired MMBtu/hr --- --- --- None
(began operation in 1969)
Caterpillar Generator No. 5, Johnson Matthey NO, RACT

07 03 Model G399 engine, natural 930 Catalytic Converter 015 NO,, Consent
gas-fired horsepower on Emission Unit 07 Agreement dated
(began operation in 1969) exhaust April 3, 1998
Caterpillar Generator No. 6, Johnson Matthey NQ, RACT

08 03 Model G399 engine, natural 930 Catalytic Converter 016 NQ, Consent
gas-fired horsepower on Emission Unit 07 Agreement dated
(began operation in 1969) exhaust April 3, 1998
Cleaver Brooks Boiler No. 10.46
09 03 2, natural gas-fired MMBtu/hr --- --- --- None
(began operation in 1969)

EMISSIONS INVENTORY

A copy of the 2000 annual emission statement is enclosed as Affachment A. Emis sions from
the Emission Units presented in Table 1 and the Insignificant Emission Units p resented in
Table 3 are summarized in the following tables.

Table 2. 2000 Actual Criteria Pollutant Emissions

Emission 2000 Criteria Pollutant Emissions (tpy)
Unit voc co, S02 PMIO NQ,
01 0.93 37.0 - 0.87 10.91
02 0.76 30.4 - 0.72 8.99
03 - 0.01 - 0.0 0.04
04 0.84 33.7 - 0.79 9.91
05 0.79 31.6 0.75 9.32
06 0.01 0.0 0.04
07 0.64 25.5 0.56 7.52
08 0.98 39.2 0.93 11.6
09 0.01 0.0 0.04
All others 0.08 0.38 0.04 0.07 1 1.5
Total 5.02 197.8 0.04 4.73 1 59.9
1: CO emissions are not required to be reported in annual Emission Statements. As a result annual CO emissions were calculated by
DEO using appropriate emission factors obtained from the application and opera bonal data provided in the annual Emission StaternenL

Emission statements only require the estimates of actual hazardous air polluta nts (HAPs) which
are non-VOC and non-PM based. There were no HAPs of this kind emifted in repo rtable
quantities at the Springfield Operations Center in 2000. Actual HAP emissions of all kinds
emitted from significant Emission Units totaled less than 150 pounds in 2000. Due to this low
level of emissions, no additional emissions information on HAPs is provided.

EMISSION UNIT APPLICABLE REQUIREMENTS - Internal Combustion Engines (Emission Units 01, 02, 04,05, 07, and 08)

This section identifies requirements established in two Consent Agreements developed to implement NO,, RACT. Copies of the Consent Agreements are enclosed in Appendix B. These requirements are part of a case-by-case NO,, RACT, which was approved by EPA and incorporated into Virginia's SIP. These requirements are currently State-only enforceable, but will become federally enforceable upon EPA's approval of the RACT into the SIP.

Limitations

* NO,, RACT limit of 2.0 grams per horsepower hour per engine, established in Condition E.2 of the April 3,1998 Consent Agreement (NVRO-031-98) between DEQ and Washington Gas.

* 9 VAC 5-40-80 of the Virginia Administrative Codes establishes a visible emissions limit of . 20% opacity at all times except for any six-minute period in any one-hour not to exceed 60% opacity. However, this applicable requirement is contained within IV.A.3 since the exhaust from the intemal combustion engines is piped directly to the boilers (Emission Units 03, 06 and 09) for heat recovery. The combined exhaust from the intemal combustion engines and boilers exit through the boiler stacks (Stack ID 01, 02 and 03).

Monitoring

Conditions 111.13.1 through 111.13.4 of the permit establish a periodic monitoring plan to provide a reasonable assurance of continuous compliance with the NO,, limit of 2.0 g/hp-hr contained in Condition III.A.1. These conditions are based on a parametric monitoring plan completed by Washington Gas as part of compliance with Condition EA of the Consent Agreements. This plan was approved by DEQ on June 11, 1999, and modified to meet the periodic monitoring requirements of Part 7b. The parametric monitoring plan is enclosed in Appendix C.

A parametric monitoring plan is a useful means of assessing ongoing compliance when a control device is used to meet compliance with a limit. This type of approach is valid when the initial performance test shows compliance by a wide margin and relevant surrogate parameters can be monitored during the test and over the life of the control device. The results of the initial compliance test showed that average NO. emissions of 0. 1 24 g/hp-hr were a fraction of the 2.0 g/hp-hr limit. The parametric monitodng plan developed for the Consent Agreem

ents
established differential temperature and pressure across the catalyst in combination with
periodic NO,, analysis as the basis of the plan. In addition, the plan provides a means to assess
the proper operation of the engines, as well as the catalyst, and provide corrective actions on
the r-atalyst and/or the engines when problems occur.

A summary of the periodic monitoring approach for NO. is as follows:

Washington Gas developed curves of engine load versus differential pressure an d
temperature across the catalyst after completion of a successful initial compl iance
demonstration and duhng the catalyst's initial six months of operation. On a daily basis,
operators will monitor both parameters and compare them to the curves. If mon itored values
are out of range (i.e., above the pressure curve or below the temperature curv e), the source
will take a step to first corroborate the initial exceedance, and the take a s eries of steps to
identify and correct the problem.
• Every six months, Washington Gas will be required to determine NO. emissions using a
portable NO, analyzer. The results will be used to determine compliance with the RACT limit
and be used to verify the temperature and pressure versus engine load curves. Adjustments
to the curves will be made as necessary.
• Once during the term of the permit, a minimum of two engines will be tested using a .

Reference Method test.
• In addition, a condition was added to require that the engines be operated a nd maintained
properly, and that operators be trained in the proper operation of the engines . This also
serves to satisfy adequate periodic monitoring for the visible emissions limit . An exceedance
of the visible emissions standard is highly unlikely so long as pipeline grade natural gas is
used and the engines are operated properly. This position is supported by the September
15, 1998 EPA memorandum from Eric Schaeffer and John Seitz, entitled 'Pehodic
Monitoring Guidance for the Title V Operating Permits Program.'

Record keeping

The permit includes requirements for maintaining records of all monitoring and testing required
by the permit. These records include the following:

• Daily differential temperature and pressure measurements across the catalyst and engine
load,
• Differential temperature and pressure measurements made during periods of co rrective
action,
• Original and adjusted curves of differential temperature and pressure versus engine load,
• NO,, emissions and related parameter measurements, made using the portable a nalyzer
during the bi-annual testing and during periods of corrective actions,
• Natural gas consumption,
• Records of scheduled and unscheduled maintenance, and
• Records of operator training.

All records are required to kept on-site for inspection by DEO and be current for the most recent

5 years. Operator training records shall be up to date for the current group of operators.

Testing

The permit requires the permiftee to conduct and EPA reference method test, id entified in the
permit, to determine compliance with the NO. limit once during the permit term . The testing is

required on a minimum of two of the six engines.

Reporting

The permit requires reporting of the following:

• Emission excursions,
• Compliance test results,
• Semi-annual reporting of daily differential temperature and pressure reading s, data recorded during periods of corrective actions, and semi-annual NOx results as required of all monitored parameters in the General Requirements section of the permit.

The permit establishes reporting schedules for all of the above items.

Streamlined Requirements

The majority of the requirements contained in the NO,, RACT Consent Agreements have been met or are continuously being met. As a result, most of the conditions of the Consent Agreements are irrelevant or obsolete and have not been included or referenced in the permit or addressed in this document. The exceptions are Condition E.2 and E.5 of NVRO-031-98, and Condition EA of both Consent Agreements. Condition E.2 contains the NQ, RACT emission limit and has not been streamlined. Condition EA required developm'ent of a p arametric monitoring plan which has already been submitted and approved by DEQ. However , Condition EA is cited in this operating permit as the basis of the several monitoring pr ovisions covedng periodic monitoring of the NO, limit. Condition E.5 has several applicable re quirements which have been streamlined by the permit as follows:

• Condition E.5 of the NVRO-031-98 Consent Agreement requires Washington Gas t o submit annual reports of RACT non-compliant activity. This condition is streamlined by Condition I I 1. E. 1 (specific to the engines) and General Condition VI 1. E of the per mit, which requires emissions excursions and permit deviations to be reported.
• Condition E.5 of the Consent Agreement also requires that logs be kept of th e daily differential temperature and pressure measurements. This is streamlined by Co ndition III.C.1 of the permit, which requires recording of daily differential temperat ure and pressure measurements.
• Additionally, Condition E.5 of the Consent Agreement requires an annual repo rt demonstrating compliance with all RACT requirements. This reporting requireme nt has been streamlined as part of the annual compliance certification General Condit ion VII.D.

Compliance with the conditions of the Title V permit ensure compliance with th e RACT requirements in the Consent Agreement.

• Finally, Condition E.5 of the Consent Agreement requires that daily records be kept for the most recent five years and be made available for inspection. The record keeping provisions contained in Section III.C of the permit provide for this.

EMISSION UNIT APPLICABLE REQUIREMENTS - Boilers (Emission Units 03, 06, and 09)

Limitations

Emissions from the boilers are regulated by 9 VAC Chapter 40, Article 8 - Emission Standards for Fuel Burning Equipment. These regulations apply to existing fuel burning units and set emission limits for sulfur dioxide, particulate matter and visible emissions. These standards were calculated as follows:

Sulfur dioxide 9 VAC 5-40-930 A(2) applies to the fuel buming equipment installation as follows:

S = 1.06 k, where k is the total capacity of applicable fuel burning units
S = 1.06 (10.46 MMBtu/hr x 3 units) = 33.3 lb/hr

Particulate Matter: There are two separate emission limits for particulate matter.
9 VAC 5-40-900 A applies to the fuel burning equipment installation and is 0.3 lb/MMBtu.

9 VAC 5-40-900 B applies to each emission unit and is calculated as follows:
PM limit = 10.46 MMBtu/hr x 0.3 lb/MMI3tu = 3.1 lb/hr.

Visible Emissions: 9 VAC 5-40-940 sets a visible emissions standard of 20 % opacity at all times except for any six-minute period in any one-hour not to exceed 60 % opacity. This visible emission limit also indirectly applies to the exhaust from the internal combustion engines (Emission Units 01, 01, 04, 05, 07 and 08). Their exhaust is piped directly to the boilers for heat recovery and the combined exhaust from the boilers and intemal combustion engines exit through the boiler stacks (Stack ID 01, 02 and 03).

Monitoring and Record keeping

So long as the units are propedy operated, maintained, and are fueled by pipeline natural gas, it is highly unlikely that the emission standards for sulfur dioxide, particulate mafter, or visible emissions will be exceeded. This position is supported when calculating worst-case emissions based on the most up to date emission factors for natural gas combustion in external combustion sources as obtained from Chapter 1.4 of AP-42, 5' edition.

Proper operation and maintenance of the boilers, as required by Condition W.B. 1 of the permit, will ensure that these emission limits are not approached. This condition also requires the source to train the boiler operators in the proper operation and maintenance of the emissions units. Records of the training and all scheduled and unscheduled maintenance are required to be kept for all operators to ensure that the proper training has been conducte

d.

Testing

The permit does not require source emissions tests. A table of test methods h as been included

in the permit if testing is performed. The DEQ and EPA have the authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Reporting

No specific reporting requirements have been included in this permit.

Streamlined Requirements

Streamlining of applicable requirements was not necessary.

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-1 1 0, that apply to all Federal operating permit sources. These include requirements for submifting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emi ssions, including those caused by upsets, within one business day.

Comments on General Conditions

B: Permit Expiration

This condition refers to the Board taking action on a permit application. The Board referred to is the State Air Pollution Control Board. The authority to take action on permit application(s) has been delegated to the Regions as allowed by 2.1-20.01:2 and 10.1-1 185 of the Code of Virginia, and the "Department of Environmental Quality Agency Policy Statement NO. 3-2001".

This general conditions'cites the entire Article(s) that follow:
B.2. Article 1 (9 VAC 5-80-50 et seq.), Part 11 of 9VAC 5 Chapter 80. Federal Permits for Stationary Sources
B.3. Article 1 (9 VAC 5-80-50 et seq.), Part 11 of 9 VAC 5 Chapter 80. Federal Permits for Stationary Sources

This general condition cites the sections that follow:
B. 9 VAC 5-80-80. 'Application'
B.2. 9 VAC 5-80-150. 'Action on Permit Applications"
B.3. 9 VAC 5-80-80. "Application"
BA. 9 VAC 5-80-80. 'Application'
BA. 9 VAC 5-80-140. "Permit shield"
B.5. 9 VAC 5-80-80. 'Application'

STATE ONLY APPLICABLE REQUIREMENTS

There are no State-only applicable requirements identified in this Section of the permit.

FUTURE APPLICABLE REQUIREMENTS

40 CFR Part 64, Compliance Assurance Monitoring (CAM), applies to pollutant-specific emission units with pre-control device emissions of regulated pollutants exceeding major source thresholds. The units must have control devices in place and have applicable requirement for the subject pollutant. The rule requires sources to monitor the operation and maintenance of the control devices to ensure compliance with applicable requirements. The internal combustion engines at Washington Gas have pre-control device emissions of NO,, of greater than 50 tons per year and are subject to a RACT standard. Therefore, CAM is applicable to the engine catalysts. However, the CAM rule defines the engines as "other pollutant-specific emission units' and submiftal of a CAM plan is not required until permit renewal. Furthermore, it is possible and even likely that the current periodic monitoring plan will satisfy the requirements of a CAM plan. Therefore, 40 CFR Part 64 is not listed as an applicable requirement.

INAPPLICABLE REQUIREMENTS

The source did not identify any inapplicable requirements.

COMPLIANCE PLAN

The source is currently in compliance with all applicable requirements.

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, record keeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-1 1 0.

Table 3. Insignificant emission units include the following:

Emission Emission Unit Pollutant(s) Rated Capacity

Unit No. Description Citation' Emifted (9 VAC (9 VAC 5-80-720
5-80-720 B) C)

10 Hitachi chiller 9 VAC 5-80-720C PM/PMJ0, SO,2, 9.2 MMBtu/hr
NO, GO, VOC

12 Cummins diesel-fired 9 VAC 5-80-720C PM/pmlo, S02, 268 horsepower
emergency generator NO,,, CO, VOC
Miscellaneous natural PM/PM10, S02, Each less than

13 gas-fired space 9 VAC 5-80-720B NO., CO, VOC 10.0 MMBtu/hr
heating units

14 Auto body paint spray 9 VAC 5-80-720B voc ---
booth
15 Paint Spray Booth 9 VAC 5-80-720B voc ---

18 Volvo diesel-fired 9 VAC 5-80-720C PM/pmlo, S02, 749 horsepower
I emergency generator I NO, CO, VOC
The citation criteria for insignificant activities are as follows:
9 VAC 5-80-720 A - Listed Insignificant Activity, Not Included in Permit Appli
cation
9 VAC 5-80-720 B - Insignificant due to emission levels
9 VAC 5-80-720 C - Insignificant due to size or production rate

CONFIDENTIAL INFORMATION

The source did not submit a request for confidentiality. All portions of the Title V application are
suitable for public review.

PUBLIC PARTICIPATION

The proposed permit was placed on public notice in the-Washington Times from August 13 Ih , 2001 to September 12h, 2001.

APPENDIX A
2000 Emission Statement

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rc'mi.
VIRGINIA DEPARTMENT OF J)e'at- ot

ENVIRONMENTAL QUALITY

EMISSION STATEMENT CERTIFICATION

I certify under penalty of law that this document and all aftachments were pre
pared under my direcbon
or supervision in accordance with a system designed to assure that qualified p
ersonnel properly gather and
evaluate the information submitted. Based on my inquiry of the person or pers
ons who manage the system,
or those persons directly responsible for gathering and evaluating the informa
bon, the information submitted
is, to the best of my knovAedge and belief, true, accurate, and complete. I a
m aware that there are -significant
penalties for submitting false information, including the possibility of fine
and imprisonment for knowing
violations.
(see reverse side for instructions)

SIGNATURE: DATE:

PRINTED NAME: Thomas F. Fryer

TITLE: Area Head, Safety and Envirorunent

COMPANY: Washington Gas Company

REGISTRATION NUMBER: 51-059-0056; 70151

TELEPHONE NUMBER:

(703) 750-5849

VIRGINIA DEPARTMENT OF MAR I 200i
ENVIRONMENTAL QUALITY
Northern VA. Region
2000 EMISSION STATEMENT [)ePt. of @-nv. Quakty

Please correct aey errors in the inforrnation below out & =IaLe2

FACILITYNAME REGISTRATION CONTACTPERSON
WASHINGTON GAS/ SPRINGFIELD OPER CTR 70151 MINTO, TANYA

LOCATION JURISDICTION

6801 INDUSTRIAL ROAD, SPRINGFIEIJ), VA 22151 FAIRFAX

GADDRESS MAILING CITY AND STATE ZJPCODE
WASHINGTON GAS/ SPFLD OPER CTR
6801 INDUSTRIAL ROAD SPRING FIELD, VA 22151
SPRINGFIELD, VA 22151
PARENT COMPANY (IF APPLICABLE) TELEPHONE NUMBER PRIMARY SIC
CODE
(703) 750-5654 4924

FACILITY TOTALS Lsum emissions from aitached pages2
ANNUA
ZONE EASON.
54r

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TOTAL NOx EMISSIONS FOR 2000 TONSIYR '561-156LssmAy
., 't -!0-011
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TOTAL PM,,, EMISSIONS FOR 2000 TONSIYR
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TOTAL TRS EMISSIONS FOR 2000 TONSIVR
TOTAL TNMOC EMISSIONS FOR 2000 TONSIYR
r
11 TOTAL non-VOCInon-PMIO HAP EMISSIONS FOR 2000 TONSIYR

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PLEASE A TTA CH "EMISSION STA TEMEAfT CERTIFICA TION" with appropriate signatu
re.

OPTION 1: EMISSION FACTOR METHOD

REGISTRATION #: 51-059-DO56a 7L POINTNO. ol-oi SEGMENT NO. 91 SCC NO.20200202

THRUPUT(.-*h.iu) 16.52 nun 5.37 Mmcf

NO. OPERATING DAYS 241 75 dw

NO. OPEELATING HOURS PEP, DAY 24 24

DAILY TffRUPLrr(.ihnit.)-@, m.,, 0.07 p- d.@,

VOC MSSION FACTOR(.iih .im)-F F. 0. 1 7 wbphr
0. 1 7 g/hp-hr

Source of Enfission Factor *0

IVOC CONTROL DEVICE CODE' (00 000

VOC CONTROL EFFICIENCY-C.E. 0 % 0

0.93 Wm VOC per yr 7.72 IW VOC pa dn

NOx EMISSION FACTOR (.ith mit.) F F. **2 9/hp4ir **2 Op-hr

Soume of Emission Famor' ST ST

NOx CONTROL DEVICE CODE' 65 65

NO%. CONTROL EFnCIENCY I-r-F 87 97

10.91 Wm NO% pw r 90.94 Pk NOX

S02 EMISSION FACTOR(.ith -in)- F.F. 0

Source of Emission Factor I *0

FUEL-PAKAMETER (% Lsh or % sWfw) - FP 0

CONTROL DEVICE CODE' (00

Avg. S02 CONTROL EFFICIENCY'-cE 0

0 on PW

PM 10 EKCSSION FACTOR (.rith =du)- EF 0.16 g4q,-hr

Soume of Emission Fsctor' *0

FUEL PAP AMETER (N. ash or % stdfur) - Fp 0

IPM IO CONTROL DEVICE CODE 2 000

Avg. PM 10 CONTROL EFFICIENCY-CE. 0

0.87

TRS EMISSION FACTORIith dw). E-F. N/A

Source of Emission Factor'

TPS CONTROL DEVICE CODE'

Av . TRS CONTROL EFFICIENCY-c F

am. TRS per

PB ElvflSSION FACTORiith -iu)- EF. N/A

Sowte ofEmission Factor

PB CONTROL DEVICE CODE'

Avg. PB CONTROL EMCIENCYI-cZ

MSIS FOR COWMoL
- - fby EPA ftft@ UW"J@ NOW (OOM). _dwW. b.W.;

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2 See co b' , coot ksw in Appwmix
3. N&A cm bal offKwicy wAn be mm N emo is n,,.m b devm OR to tociarwamftlmrcmr d o.s. EF io w -job*-,Alhm,,
4. ANNLIAL EMISSIONS - ANNUAL THRUPUT x EF x FP x JWM) x 1100-CEYiOD; OZONE EM IISSIONS - OMLY THRUPUT x EF x FP x (joo-CE yioo
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Nobuaf Gas Mpatirie Transrrmssion indu3by ISU; FMWUSIY SPPMM by OM
NOx emission factor changed ftm i S%ftp4w to 2g1b" due to the instokftn of con trol equiprot

OPTION 1: ENSSION FACTOR METHOD

REGISTRATION #: 51-05"0560 7U.@-L POINT NO. 21M SEGMENT NO. ol SCC NO.2020020

THRUPUT(with units) 13,56 .4 3.56

NO. OPERATTNG DAYS 198 so da,

No. OpFRAiTNG HOURS PER DAY 24 24 hors

DAILY THRUPUT(with mmodw-p-c /d- 0.07 M dw

VOC EMISSION FACTOR(with mia)-E.F- 0.17 g4w-br 0. 1 7 op-hr

Source of Emission Fmaor 1 00 *0

VOC CONTROL DEVICE CODE' 000 000

VOC CONTROL EMCIENCY-CJE 0 % 0 %
0.76 "es VOC pff ys 7.66 lbs VOC pa day

NOx EMISSION FACTOR (with umitg) E.F. $02 gAp4,r **2 Op4ir

Source ofEmission Factor' ST ST

--NOx CONTROL DEVICE CODE' 65 65

NOx CONTROL EFFICIENCY'-C.E 97 % 87
8.99 mu NOx per r 901 lbs NOx dij

S02 EMISSION FACTOR(with unitt)- E.F. 0 wly,-hr

Saume of Emission Factor' 00

FUEL PARAMETER (% sih or % sulfur) - FP 0

DEVICE CODE' 000

Avg. EFFICIENCY-C-L 0
0

PMIO ENUSSION FACTOR (.idk uaits)- E-F. 0.16 g,44)-hr

Soume of Emission Factor' *0

,FUEL PARAMETER (% ash or % sWfur) - FP 0
PMIO CONTROL DEVICE CODE2 000

Pmio CONTROL EFFICIENCY-c.E
0.72 0 per

TRS EMISSION FACTOR(wid- wints)- F-F. NJA_

Soume of Emission Factor 1
TRS CONTROL DEVICE CODE 2
Av . TRS CONTROL EFFICIENCY-C.E.

PB EMISSION FACT(RI"ith units)- ILF. N/A

Source of Emisaion Factor I

PB CONTROL DEVICE CODE'
g. PB CONTROL EFFICIENCY-c.F-
to
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Pap 3
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2. See coo b I , cod" ktod in AppwML
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Natural Gas Pipoine Transmimoon trpdustry 1968; pw4iou* approved by DEO
NOx eminion factDr changed from lSgMhp-hr tD 20*p-hr due to tm of omtb equipmw d

-..v Q111iQ01@.0" I
OPTION 1: EMISSION FACTOR METHC1-

REGISTRATION #: 51-05MO567 7= POINT NO. QL-0 SEGMENT NO. Qi SCC NO. 10300602

THRUPUT(wnh mui 0.88 mmd 0.38 mmci

NO. OPERATING DAYS 9.6 dro 3.7 dm

NO. OPERATING HOUELS PER DAY I 0 hm" I 0 hours

DAILY THRUPUT(with wdt0-Ihrq;sut Idw 0.103 p- d"

VOC EMISSION FACTOR(with Lwits@-F F. 5-5 ib/mmcf 5.5 ibimmcf

Soume of Emission Factor AP42 AP42

VOC CONTROL DEVICE CODE' 000 000

vg. VOC CONT'ROL EFFICEENCY'-C-E. 0 1% 0 %

0.002 VOC per r 0.02 lbs VOC per dry

NOx EMISSION FACTOR (with units) E-F. 100 lb/MMCf 100 lb/MmCf

Source of Ernission Factor I AP42 AP42

NOx CONTROL DEVICE CODE' 000 000

vg. NOx CONTROL EFFICIENCY'-C E. 0 % 0

 0.04 mm NOX pw yi 0.3

S02 ENUSSION FACTOR(with uruts)- E.F. 0.6 mimmd

Source of Fmission Factor AP42

FUEL PARAMETER (% ash or % sulfur) FP 0

ICE CODE' 000
_ISO2 CONTROL DEV

Avg. S02 CONTROL EFFICIENCY-C.E 0

 0.00026 wu S02 per ra

PM I 0 ENOSSION FACTOR (with units)- F-F. 7.6 twmmrf

Sourec of Emission Factor' AP42

FUEL PARANM-MR (% ash or % sulfur) - FP 0

IPM IO CONTROL DEVICE CODE 2 000

Avg. PM IO CONT'ROL EFFICIENCY'-C-E 0

0.0034 mm

TRSEMSSIONFACTOR(.ith..ifs@-E.F_ -

Source of Emission Factor 1

TRS CONTROL DEVICE CODE 2

Avg. TRS CONT'ROL EFFICIENCY'-C.E.

wra TItS

PB EMISSION FACTOR(@ith .ift)- E F. N/A

Source of Ernission Factor

PB CONTROL DEVICE CODE'

.,Avg. PB CONTROL EFFICEENCY-C-E.

PB pw
BASIS FOR CONTROL EFFICIENCIES: _bWed (by EPA Relow MWOM; ONed IOU": _dWW; -MM WW b@WM; _GthW (desaft an sepwas snnQ.
Page 3
1 . AP-42,ST= Stwk Test CEMS: F - F, - I Factor (EPA stanclenll ham from AIRS) : 0 - Olw (deacritso on sopWIft ~ Lao SLtod lo DEo oppnwo)
2. segOol.bDldeviCOCOdeSliswinAppwxtt
3. Notsconb OMCieriCyWdlbDZGMffvmmisrioccoibaidevimORftwf@ulonfiKOBOwLsOlbrow* ols(i.o.EFiskMrMfodtobelwtlhcw*otsl.
4. ANNUAL EMISSIONS - ANNUAL THRUPUT x EF x FP x (lr2=) x (10Dr-E)1100. OZONE EMISSIONS - DOULY THRUPLIT x EF x FP x (IOD-r-E)n0o

OPTION 1: EMISSION FACTOR METHOD

REGISTRATIONM 51-059-00567 701-- POINT NO. D2:QA SEGMENT NO. Ql @,CC N0.700Q20
2

THRUPUT(-i*w.iu) 15.04 4.65 mmcf
NO. OPERATING DAYS 219 65 dn-0
NO. OPERATTNG HOURS PER DAY 24 24 ho."
DAILY THRUPUT(.ith =its)-duuput /days 0.07

VOC EMISSION FACTOR(.ith win@-E-F. 0. 1 7 &4*4,r 0. 1 7
Scume ofEmission Faaar' *0

VOC CONTROL DEVICE CODF' Om 000
g. VOC CONTROL EFFICIENCY-C.E 0 'A 0 %
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SION FACTOR (wi* miu) E.F. **2 g/hp-by **2 gAp4ir
ofEmission Faaor I ST ST
Ox CONTROL DEVICE CODE' 65 65
Avg.NOxCONIK0 EFFICTENCY'-C.E. 97 87
9.91 mm NO. P. Y4 90.7 lbsNMpwdj
S02 EMISSION FACTOR(.ith mns)- E-F. 0 Wbp4ff
Source ofEwis&ion Facw' *0

FUEL PARAMETER (% ash or % sWfur) - FP 0
S02 CONTROL DEVICE CODF' 000
vg. S02 CON'MOL EFFICIENCY'-C.E. 0
0 to per
ON FACTOR Iidi wkis)- EF. 0.16 gAqAr
aume of Emission Facor 1 00

FUEL PARAMETER (% ash or % sulfisr) - FP 0 %
PM ID CONTPOL DEVICE CODE' 000
Avg. PM 10 CONTROL EFFICIENCY-C.E. 0
0.79 per
TRS ENflSSION FACTORi.,ft im)- EF. N/A
Sourcc ofEmission Fs-ctor I -
TRS CONTROL DEVICE CODE'
Avg. TRS CON'TROL EFFICIENCY-C.F.
am per
PB EMLSSION FACTORjhh uniw)- E-F. N/A
Soume ofEniission Fwar'
PB CONTROL DEVTCE CODE'
Avg- PB CONTROL EFFiCIENCV-c.E.

BAStS FOR COKIRM EFFICM4MM _@p@ ft EPA PAin bboWN4 bowd (ofwt _*alp; _wwbM bWa
Rw _~ (oweew d"O.
Pa" 3
1. AP-4Z ST- SW& Test CEMS; F - Fedwd FacW (EPA SUWMWd 90COor kffl AIRSX 0 - D
ew (desorbe on sepWalo "m use st*JW b DEO approval)
2. S" mr" drAm cod" bW in Appsn*L
3. Nob aMral offcm iq wi be zwo it U me is rio coo 0 Cot to annom hem sowunts
for (i.o. EF is WWMW to be -wM corWaln.
4 .ANNUAL BAISSIONS - ANNUAL THRUPLrr x EF x FP x VrAWO) x 000-CE)MOD; OZDNE E
bOSSIONS - DAILY TKRUPUT x EF x FP x (10O.CE)MOD
Soutwmg Re"arch lnstMe Comptishm of Enussions Date for Sbftmiy Roopmmhm Gas En
pnos and Ges Turunes in Use by me
Nahffvi Gas Rpoine Transngssion industry I 988; M-busly approved by DEQ
NOx wrinion factor changod from i Sgftp-hr to 29ftp-hr due to #* bwbftbm d cof
t equipmerit

OPTION 1: EMISSION FACTOR METHOD

REGISTRATIONt 51-059-0056m701- POINT NO. QM SEGMENT NO. SCC NO. 20200202

UPU`r(.ith=i=) 14.03 mmCf! 3.24 mmc
OPEPATING DAYS 206 46
OPERATTNG HOURS PER DAY 24 24 hom
LY THRUPUT(wnh wun)-nimuim idmi 0.07 pff d3V
VOC EMISSION FACTOR(wigh unks)-EY. 0.17 ophr 0. 1 7 Op-hr
Soume of Emission Factor 00 0 0
VOC CONTROL DEVICE CODE' ow 000
Avg. VOC CONTROL EMCEENCY-C.F. 0 'A 0 %
0.79 am VOC ptr yi 7.66 lbs VOC pff Wq
NOx EMISSION FACTOR (witb umft) E.F. **2 wtp-hr **2 g4w-hr
Source of Emission Factor' ST ST
NOx CONTROL DEVICE CODE 65 65
Avg. NOx CONTROL EMCIENCY'-C.E. % 97 -4
9.32 mm NOx pa yi 90.11 PA
S02 EMISSION FACTOR(%vh wgW- EF. 0 orhr
Sourre of Emission Factor *0

FUEL PARAMETER (% ash or % sulhw) - FP 0
S02 CONTPOL DEVICE CODE' 000
vg. S02 CONTROL EFFICIENCY-C.E. 0
0
FACTOR 4whb saw- E.F 0.16 Op4tr
Source of Emission Factor' 00

FUFL PARAMETER (% ash or % sulfisr) - FP 0
PM IO CONTROL DEVICE CODE' 000
Avg. PM 10 CONTROL EFFICIENCY-C.E. 0
0.75 Una PM IO per
TRS EMISSION FACTDR(.itb...b)- EY N/A
Source of F-mission Factor
TRS CONTROL DEVICE CODE 2
Ay - TRS CONTROL EFFICIENCY-c.E
k PCF
PB EMISSION FACTOR(.,ft im)- E.F. N/A
Source (if Esnission Fwor'
P13 CONTROL DEVICE CODE'
OL EFFICIENCY-c.E
to
MOMS FOR CONMOL EFFICIENCIES:. __Umbd EPA Rwkm@ Ustoft ftWAd (olwt _dmp; _w&1w
W --w-
Page 3
1. AP-42; ST- SuK* Tert; CEMS. F - F 1 Factot (EPA surdord inclor ftm AIRS); 0
 - Olw (donarbe an sepwate si u" subJect to DEO appmvan
2. So* cxWW draw cofts bW in AppermfoL
3. Notocemb effcwlcywdbomoiftmecsnoccxtb draceOR"effissionfeclorawwwrilstw- -1
 (i.O.EFis lifi to be lefth corimin.
4. ANNUAL EMISSIONS - ANNUAL THRUPUr x EF x FP x (I I x (100-CEYIOO; OZONE EMI
MONS - DOkJLY THRUPVr x EF x FP x (100-CWOD
SouUmest Research Inshtub Compliagon of Emissions Data thr Stabonsty ReaWwAiNn
g Gas Engines and Gas Tutbims in Use by On
Natural Gas Pipoine Transmission lndusiry 1988; previously approved by DEO
NOx emission factor changed frorn I -rVtbhp-hr tD 29ftp-hr due tD the WotdOon
of control equOmnt

,&W%ov 1 twil-Z
OPTION 1: EMISSION FACTOR METHr-

REGISTRATION 151-n.59-00567 7QW POINT NO. Q2M SEGMENT NO. Ql SCC NO. 10300602

THRUPUT*,h win) 0.85 mmcf 0.36 mmcf

NO. OPERATING DAYS 9.3 dws 3.5 dm

NO. OPERATING HOURS PER DAY 10 h-4 10 hours

DAELY THRUPUT(vAth um*-*@ idrfs 0.103 pw&y

VOC EMISSION FACTOR(with wiho-EF 5.5 lbimmef 5.5 IWMMd

Source ofEmission Fmor AP42 AP42

VOC CONTROL DEVICE CODE 2 000

9. VOC CONTROL EFFICIENCY'-CE 0 'A 0 %

0.002 mm VOC per r 0.02 lbs VOC per day

FACTOR (.mh is) EF. 100 lbtMmCf 100 lb/mmcf

Soume of Emissicm Fsaor AP42 AP42

NOX CONTROL DEVICF CODE' 000 000

Avg. NOx CONTROL EFFICIENCY'-C.E 0 % 0 %

 0.04 wm NOx per4 0.32 lbs NOX 1. 4

S02 EMSSION FACTOR(with unit0- E.F. 0.6 btmmcf

Source of Emission Factor ' AP42

FUEL PARAMETER (*/# ash or % sulhir) - FP 0

S02 CONTROL DEVICE CODE' 000

vg. S02 CONTROL EFFICIENCY'-C.E 0

0.0002

I'MIOEMISSIONFACTOR(withmift)-EF. 7.6 ib/mmcf

Soume of Finission Factor AP42

FUEL PARAhIETER (% ash or % sulfur) FP 0

PMIO CONTROL DEVICE CODE' 000

PMIO CONTROL EFFICEENCY'-C.E 0

0.003

TRS EAESSION FACTORiith.Wts)- EF. N/A

Soume ofFmission Fmor 1

TRS CONTROL DEVICE CODE 2

Av . TRS CONMOL EMCIENCY-C-E

7m per

PB EMISSION FACTOR(@th wis)- EF. VA

Source of iission Fador 1

PB CONTROL DEVICE CODE'

Av . PB CONTROL EFFICMNCYI-C.E.

mm Pe
mdftEPAR _MKWW' "nafte an wpafaw WOW.
Pap 3
i - AP-42: ST- SUKk TaK CEMS: F - F - F8cW(EPA$Wdu ftcWr*VmA1RS); 0-01hW(d@a0f t0n p el UN a opa to OFO SPP"Pwml)
2. S"cmit a@,vmcod"kVAdinAppwv*L
3. isnon, 'devio*OftftomWdmbckorowo"brwnVoMCLO.EFlaWwWWoob*Nftm*oW-,.
4. ANNUALEMISSIONS-ANNLIALTHRUPLffxEFxFPx(irVMx(100-.CEYIW.OMWBALSSIONS-DAILYT HRUPUTxEFxFPx(loo.CE)MOD

OPTION 1: EMISSION FACTOR METH001

REGISTRATION#: 51-05 4005677u-1 POINT NO. D3.:QZ SEGMENT NO. 21 SCC NO. 202002
02

THRUPUT(.ith min) 11.32 MA 2.19 mmd

NO. OPEFLAnNG DAYS 166 31 d@s

NO. OPERAnNG HOURS PER DAY 24 24 houn

DAILY THRUPUTiwkb WAW-thmpwt Mays 0.07 pc, da@

VOC EMISSION FACTOR(with vaitz),-E-F. 0. 1 7 g4ap-br 0. 1 7 Op-hr

Soume of EmiWon Famor *0 00

VOC CONT'ROL DEVICE CODE 2 000 000

Avg. VOC CONTROL EFFICIENCY-C.E 0 0
0.64 NM VOC per ye 7.64 lbs VOC per cis)

NOx EMISSION FACMR (.ithmits) E.F. **2 g1hp-hr **2 Ap-hr

Source of Emission Fawar ST ST

NOx CONTROL DEVICE CODE 65 65

Avg. NOx CONTROL EFFICtENCY '-cm. 87 97 %
7.52 Wm NO% pa 3m 89.8 1

S02 EMISSION FACTOPAwith unito- F.F. 0 g/hp-hr

Soume of Emission Faaor *0

FUEL PARAMETER I% ash or % sulfw) FP 0

S02 CONTROL DEVICE CODE' 000

Avg. EFFICIENCY'-C.E. 0

0 mm S02 per

PM I 0 EMISSION FACMR (Mth unias)- E.F. 0.16 g4q),-br

Source of Emission Fww *0

FUEL PARAMETER (% ash or % sWfisr) = FP

PM I 0 CONT'ROL DEVICE CODE 2 000

Avg. PM IO CON'MOL EFFICIENCY-c-E 0

0.6 am PMIO per

TRS EMISSION FACTORtwith.Wt.)-E.F. N/A

Soume of Ernission Fa='

TRS CONTROL DEVICE CODE 2

Av . TRS CONTROL EFFICIENCY-c.E.

am TRS pw

PBEMISSIONFACTOR(whb..its).F-F.- N/A

Source of Ernission Fmor'

PB CONTROL DEVICE CODE 2

lAvg. PB CONTROL EFFICIENCY-C.E.

uw PB pcr
DAMS FOR COWRIX EFFKANCIn:
_@=W OW EPA Rokwom JOW _d-OW; ---- P-IWA _ww 1,01,006 M 1.poa.
Page 3
1. AP-42; ST- &Ack Ted;t CEMS; F - FddwO Faclor (EPA I ftrn AIRS); 0 - Omw (de scrbe an u" Si 600 fa DEO Wpvnd)
2 . See conti dwnm coos ksm in Appwwtx
3. Note Col.. N I " be mo d $we is rio cei bol dowim OR Ow wrission P sccmM br (i.o. EF is Wm Uflod to be -wft cw*cIn.
4. ANNUAL EMISSKM - ANNUAL THRUPUT x EF x FP x OrIM) x 0OO-CEY1W. OZONE BAISSI ONS - DAILY THRUPUT x EF x FP x (100-CE)MOD
Souftwest Resewch lnsbWto Compilabon of Eimssms Data for Stabonary Fbaprocohng Gas Engmes and Gas Turbnes m Use by d*
Notml Gas F*wkne Transmission industry 1988; previously appn"d by DEO
NOx anussion imMr changed from 15g/bhp-hr to 2g/bhp-hr due to the inslallabon of control equonmmt

OPTION 1: EMISSION FACTOR METHOD

REGISTRATION #: 51-059-0056:7DJ-, POINT NO. 03=0A SEGMENT NO.-U o%@C NO. 202OQ 202

THRUPUT(.id...its) 17A5 MMCJ 5.15 mrncf

NO. OPEFLATING DAYS 255 J 72 dn,

NO. OPFILATING HOURS PER DAY 24 24 hwes

DAILY THRUPLrr(mth wsiW-dmww /dm-i 0.07 P-dm*

VOC ENUSSION FACTORW& unim)-E.F. 0.17 g/hp4ir 0. 17 pAp4ir

Source ofEmission Faaor 00 *0

VOCCON-MOL DEVICE CODE' ow 000

CONTROL EFFICIENCY-C.E. 0 0

O." VOC per Y, 7.73 lbs VOC per ds@

ION FACTOR (.ith mitsi E.F. **2 s/hp-hr **2 gibphr

ofFinission Factor, ST ST

INOx CON-MOL DEVICE CODE' 65 65

NOx CONTROL FFFICIENCY'-C.E. 97 % 87

1 1.59 Ons Nch pa 90.95 lbs NOx pff day

S02 EMISSION FACTOR(whb witz)- E.F. 0 gAIp-hr

Source of Eminion Fwiar 1 *0

FUEL PARAMETER (% ash or % sulfur) - FP 0

S02 CONTROL DEVICE CODE' Om

Avg. S02 CONTROL EFFICIENCY-C-E. 0

0

10 ION FACTOR Wth units@- E-F. 0. 16 gnq--hr

Source ofEmiission Factor 1 00

FUEL PARAMETER (% ash or % sulfiw) - FP 0

PMIO CONT-ROL DEVICE CODF' 000

Avg. PM] 0 CONTROL EFFICIENCY-c.E. 0

0.93 NW PLT

T'RS FivnSSION FACTOR(wid, WaftI- E.F.- N/A

Source ofEmiLsion Factor'

TRS CONTROL DEVICE CODE'

Av . TRS CONTROL EFFICIENCY-C.E.

PB EMISSION FACTORii& mitop. E.F@__ NIA

Source of Eniinion Fsctor I

PB CONT'ROL DEVICE CODE'

Wm Ps
BAM MR C4DNrMX EFFKMNM: _wood fay EPA Roknmo 0 Umbd (W.@rX -dNW; _MNWW _sow (d waft an m"waw *wG15.
Page 3
1. AP-42; ST- Stw* Test; CEMS, F - FedwW Facom (EPA sMndwd ftclor km AIRS); 0 - ORM (desaw on SGPWOW ~ Los mAim 10 DEQ appmal)
2. Sw coo omwim codms AW W AppendbL
3. Noincono Wkwicyw0besarageweisnocoft devic&OlttwwnWaionfbcWacmmftbrcm&als(Le .EFlakWMedlobslwkhcor*oW).
4. ANNUAL EMISSIONS - ANNUAL THRUPUT x EF x FP x (1) x (1004DE)MOO; OZONE EWSS IONS - CWLY THRUPUr x EF x FP x (IOD-CEylOO
Southwest Res"rch lnsftft Compiimbw of Effissions Data for SWonsty Rm*row&V Ga s Engines and Gas Tu*nes in Use by ft
Nehiral Ges Apaine TtansiMssion Industry 1980; Previot@ OPP--d by DEO
NOx emission factor dwoged ffom I SWbhp-hr to 29rdq)-hr dLis to the hutWkftn o f control equonwd

-r-TION 1: EMISSION FACTOR METHOD

REGISTRATION #: 51-059-0056, 7 POINT NO. 03-09 SEGMENT NO.-U z%.;C NO. 1030060
2

THRUPLIT(whk =its) 0.82 rnmcA 0.34 mmcf

NO. OPERATrNG DAYS 7.9 *-5 3.3 d@3

NO. OPERATING HOURS PER DAY I 0 1 0

DAILY THRUPLIT(.ith wo).6nnnt Mm 0.103 pff d@

VOC EMISSION FACTOR(with wts)--F-F. 5.5 Wnmcf 5.5 ib/mmd

Source of Endssion Factor' AP-42 AP-42

VOC CONTROL DEVICE CODE 2 000 000

CONTROL EFFICIENCY-CY- 0 'A 0 %

0.002 Wm VOC per r 0.02 lbs VOC pa day

FACTOR w& uniu) E.F. 100 ibimmd 100 lb/mmd

Soume of Emistion Faaor ' AP42 AP42

NOx CONTROL DEVICE CODE 2 000 000

Avg. NOx CONT'ROL EFFICIENCY'-C.E. 0 % 0 %

O.OA wm NOx pa yi 0.33 IWISIMpordoy

S02 EMISSION FACTORwth uaiu)- E.F. 0.6 lbimmd

Source of Emission Factor' AP42

FUEL PARAMETER (% ash or % sulfur) FP 0

S02 CONTROL DEVICE CODE' 000

Avg. EFFICIENCY-C.E. 0
0.0002 mm S02 p

PM I 0 EMISSION FACTOR (.,A kx)- E.F. 7.6 lbimmd

Source of Emissiou Factor 1 AP42

FUEL PARAMETER (% ash or % sulfur) - FP 0

PM 10 CONTROL DEVICE CODE 2 000

Avg. PM IO CONTROL EFFICIENCY-C-E. 0

0.003

TRS EMISSION FACTOR(with wAu@- E.F. N/A

Source of Emissicyn Factor'

TRS CONTROL DEVICE CODE 2

Av . TRS CONTROL EMCIENCY-C.E

PB EMISSION FACTORtwnb uwu)- E.F. N/A

Source ofEFnission Fjtctor'

PB CONT'ROL DEVICE CODE 2

hAva PR COWTROI FrFirwmrY1-r r

mm
BAMS r-OR C43-h"01. EMCIENGIM: _hwWd Oy EPA R UWwQ; NwAd (*IIN": _d@*Wk _-AbOW behmm; _.gm (deem" m
Page 3
1. AP42: ST- Stock T"t CDAS; F - FedwW Faclor (EPA 1- ftclor ftm AIRS); 0 - Ob w (doeaft an Lm atind to OEQ apprwilg)
2. See corib I c codu kNed in Appsrwg)L
3 Noteownp offcwicyvAlibazwoirom isnocoieboldeviosOR#womWsbntecharsomuntsfor P .*. EF iB kW~ to be IwNh conlrohn.
4. ANNUJkL EMISSIONS - ANNUALL TMRUPUT x EF x FP x 020W) x 000-CEY'100,. OZON E EMISralONS - DMLY THRUPUT x EF x FP x (JOD-CEyJOD

Please note that these hours are voy conservabn (> 365 deys per year and > 90 d"s durkV ozone amson); this is due tD ft foct that the bolor hours are being datermirsed based on the two supporting gomrstDr houm; in order tD not underss bmab houm fbr the boiw, It hot tD be assunied ftt the genomtom operate one st a tirrw;
thomfore. the hours for the two gomratom are summed in order to obtoin hours f or the boftr (atitiough Wm is a conwrvat" witmation).

OPTION 1: EMISSION FACTOR METHOn

REGISTRATIONt 51-05M050-701-A POINT NO. Q" SEGMENT NO. Ql SCC NO. 10500206

THRUpUT(.i&.iw) -1.75 -.4 1.69 mmcf

NO.OPERATINGDA-YS 23 aA 22 d."

NO. OPEELATING HOURS PEP, DAY 24 I-A 24 houn

DAELY THRUPUT(wnh mts)-*a@ /dro 0.08 perdw

VOC FMSSION FAC'FORtth u)-F F 3.8 ib%mcf 3.8 ib/mmcf

Source of Emission Factor 1 AP-42 AP-42

IVOC CONTROL DEVICE CODE' @00 O(O

VOC CONT'ROL EFFICIENCY'-c.F- 0 % 0 %

0.003 mm VOC per r 0.29 lbs VOC pw

NOx EMISSION FACTOR (.Ath @nit,) F F. 100 lwffwncf 100 lwmmcf

Source of Einission Factor AP42 AP42

NOx CONTROL DEVICE CODE' 000 000

Avg. NOx CONTROL EMCIENCY 1-c.E 0 0/4 0 0/4

0.087 Nox per 7.62 lbs NOX per

so FACTORw%h..i*- EF 0.6 twmmcr

urce 0 on Factor AP42

FUEL PARAMETER (1/, asb or % sulfur) FP 0

S02 CONTROL DEVICE CODE' 000

Avg. S02 CONT'ROL EFFICEENCY-C.E. 0

0.0005 mm S02 pw

PMIO EMISSION FACT'OR (.id,..ia)- F F. 12 lbhnfficf

Source of Emission Famor AP42

FLTEL PARANE-M (% ash or % sulfur) - FP 0

PMIO CONTROL DEVICE CODF' 000

vg. PMIO CONTROL EFFICIENCY'-c-E. 0

 0.01 WUPMIOPW

TRS EMISSION FACTORiiih n)- F-F. MIA

Source of Emission Factor 1

TRS CONTROL DEVICE CODE

Av . TRS CONTROL EFFICIENCYI-cF

mm TRS pw

PB EMISSION FACTORIri& im)- ELF N/A

Sourre of Emission Faam 1

PB CONTROL DEVICE CODE'

Avg. PB CONTROL EFFICIENCY-C.E.

am PB per
IIASIS FOR CONMOL EFFOEWIEW _WsW ft EPA Roftmom boom -doom -mmeow Downce; -00M W..PWM. w"O.

I - AP-42; ST= Steck Test CEMS; F - Fedwal Faclor (EPA O-ONW(descHWansepwafteh ntunvjji"o[)Eapp,,,Ml) Pop 3

2. See conti code$ hsftd in Appwxlx
3. Not9cx*t1effidwicywf1jbawmtfuw isnowe dvAmoittm I 1-1 8000untsforommol Q-*. EFis'- NJ tob,-*jMwr*oh0.
4. ANNUALEMISSIONS-ANNUALTHRUPUTxFFxFPx(ln"x(iGD-CE)MM. OZONFEMISSK)NS-DAILYT HRUPUtxEFxFPx(IOD-CE)MOD

OPTION 1: EMISSION FACTOR METHOD

REGISTRATION POINT NO. 06-12 SEGMENT NO. 91 oCC NO. 20300101

1658 3 gallons

NO. OPEPAITNG DAYS 2 < I d-"

NO. OPERATING HOURS PER DAY *24 *6 ham1dy

DAILY THRUPU`r4.vh oxw@-d@ J&- -3 -11.m w d.@

VOC ENflSSION FACTOR(wiih voits0F.F. 0.04 g"4w 0.04 gfn"r

Sowee of F-m- ion Facwr 1 0*00 *000

VOC CONTROL DEVICE CODE' 000 000

lAvg. VOC CONTROL EFFICIENCY-CF 0 0 %

 0.0007 km VOC pa yi 0.15 FM VOC PM da)

NOx ENGSSION FACrOR (.Ath voia) EF 1.6 9/hp4V 1.6 gthp-hr

Saume of Emission Fa= 1 ***O 00*0

NOx CONTROL DEVICE CODE' 000 000

Avg. NOx CONTROL EFFICIENCY'-CE 0 % 0 %

0.03 mm Wk pw r 6.14 Pm NOx pw dmy

S02 EMISSION FACTORihh -iuo Ef. 0 glhp-hr

Sourre of Emission Factor' ***O

FUEL PARAMETER M uh or % sulfisr) - FP 0.0469 %

CONTROL DEVICE CODE' 000

Avg. CONTROL EFFICIENCY-CE 0

0 am S02

1 0 SSION FACTOR (.itk wits)- EF. 0.16 gMp-hr

isow" of Emission FactorI *000

FUEL PARAMETER (1/. ash or % sWfiff) - FP 0.0469

PM 10 CONTROL DEVICE CODE' 000

Avg. PM 10 CONTROL EFFICIENCY-C-E 0

0.003

T'RS EMISSION FACTOR(.ith wait0- EF. N/A

Source of ErWssion FwwI

TRS CONTROL D CE CODE'

TRS CONTROL EFFICIENCY-CF.

PB EWSSION FACTOR(wid. amim)- EF. WA

Source of Emission Factor'

Pj3 coNTROL DEVICE CODE'

Avg. PB CONTROL EFFICtENCY1--E PR pw
SAMS FOR CONTROL EFFCWJCM: _Iwaof (by EPA Rwk@ MWon Msftd fWwt _dmr; _.@Wo boh @; _a Iq
Pop 3
1 -AP-42; ST- Stock Test CEMS; F - Fodwg Faclor (EPA,ftclor 6mn AIRS); 0 - O@w (dwafte an w4maw un sutiacr lo DEO apprpwo
2. S"m codnirAdinAppwKbL
3. Nft-- oRom bew accouwA lor - (ii.e.EFie"
4. ANNUALEMISSIONS-ANNUALTHRUPUTxFFxFPx(ir2DW)x(IOaCEYIW., OZONErb4MONS-CWLYTH RUPVrxEFxFPx(IOD-CE)MOO

Due to the tact that this is a stand-by generator, Me - -11 tn run dWklod by t oW number of opera" dop woe used (i.e. NOT bmsed ml 24 hoLff/day opendion)
ANhoLigh galWmft is provided hem as mquaged, enumm colcuWLions wwo band an hoL n opwated grzb OmmiOn factws am in unft of grwu per hp-W
Soudme&tRosewchbwbbA*CompoeftnofEflusxmsDainforStabonstyR@dprocabVGwEnpnos&rp dG@sTuit*msinUsebymo
Naftff&(GaSAPObn@Tnummssmir,dusbylOSS; Pr*viOu*aPP'- by DE'O

d.UUU t-_Mltio1%J'1d %-P%L_t_ULA. f l0viZ,

OPTION 1: EMISSION FACTOR METFir'-

REGISTRATIONP 51-059-0056- Z= POINT NO. QL-13 SEGMENT NO. Ql SCC NO. 10500206

THRUPUT(wilhunits), 18 mmCJ 3.6 mmcf

NO. OPERATING DAYS 365 'A 92 days

NO. OFEELATING HOURS PER DAY 24 h-4 24

DAILY THRUPUT(whh units)-&mpw /days 0.04 p- &Y

VOC ENUSSION FACTOR(-ith %miu)-E-F. 3.8 lbimmcf 3.8 lb/mmcf

Soume of Emission Fmor 1 AP-42 AP42

VOC CON-MOL DEVICE CODE' 000 000

VOC CONTROL EMCIENCY'-C.E. 0 % 0

0.03 mm VOC per yr 0.15 lbs VOC per day

NOx EMSSION FACrOR (widi -its) F-F 100 lb/mMd I 00 lb/mnld

Source of Emission Factor AP42 AP42

NOx CONTROL DEVICE CODE' 000 000

Avq NOx CONTROL EFFICIENCY'-C.F- 0 0 %

0.9 OMNOKPWA 3.9 lbsNOxp-dj

FACT'OR(with mits@- F-F. 0.6 ibimmcf

Soume o ssion Factor AP42

nrEL PARAMETER (% ash or % sulfur) FP 0

S02 CONTROL DEVICE CODE 2 000

Avg. S02 CONTROL EFFICIENCY'-C-L 0

0.005 wm 502 pw

PM I 0 ENOSSION FACTOR iwith units)- EF. 13.7 mirnnict

Soume of Emission Factor' AP42

FUEL PARANCETER (% ash or % sWfiir) - FP 0

VICE CODF 2
IOCONMOLDE ow

Avg. PMIO CONTROL EFFICEENCY-C.E. 0

0.12

FACTOR(whh unia)- EF WA

Source of Emission Factor 1

TRS CONTROL DEVICE CODE 2

Avg. TRS CONTROL EFFICIENCY-C.E

wa TRS pw

PB EMSSION FACTOR(with mnia)- EF. N/A

Soume of Emission Factor 1

PB CONTROL DEVICE CODE

Avg. PB CONTROL EFFICEENCY-C.E

Wm Po pmr)

OA345 FOR CONTROL EFF ly EPA Rehowm inNed JoV"; _dN54K -MOWW I _Wm ansopmM6000).,

Page 3

1. AP-42; ST= Sbkck Test CEMS; F - F Fww (EPA fem fmm AJRS); 0 - Otw an p La* subod b DEO mpprov"

2. Seaccxib 0rAo*cOd*91isWinAppwx2L

3. Nalwconb offiamnywMbozwoNVomiermoixibol OROwernissionf , samunufarx 0.&EF18 1- HR tobelwMwwohn.

4. ANNUALEMISSIONS-ANNLKLTHRUPLrTxgFxFPx(ir,=Mx(IOD-CEYID&, OZONEEMISSIONS-DAI LYTHRUPUTxEFxFpx(IOD-CEyIW

OPTION 1: EMSSION FACTOR METHOD

REGISTRATIONM 51-05 QQJL--&--L POINT NO. OLM SEGMENT NO. Ql SCC NO. 20200401

THRUPUT(.mh iu) 1680 94

NO. OPERATING DAYS 1 8 5

NO. OPEILA77NG HOURS PER DAY *257 *2.6

DAILY THRUPUTi-ith vWa)-@ Adm -18.8

VOC EMISSION FACTORW4 witia)-E-F. I gftp-hr IOhp-hr

Scume ofEinission Factor' **00 ***O

VOC CONTROL DEVICE CODE' 4(00 000

Avg. CONT'ROL EFFICIENCY,-C.F- 0 'A %

0.038 am VOC pcr yi 0.048 lbs VOC pu doi)

SSION FACMR (with wib) EF. 6.9 tvbbp-hr 6.9 WMp4,r

Sounc of Emission Fador I *000 *0*0

NOx CONTROL DEVICE CODE' 000 000

Avg. NOx CONT'ROL EFFICIENCY-C-L 0 % 0 %
0.2m was NO% per yi 0.329

02 EMISSION FACTOR(with uWts)- EF. 0.1 Ohp-hr

of Emission Factor' AP42

PARAMETER (% ash or % sulfur) FP 0.0469

CONT'ROL DEVICE CODE' 000

S02 CONTROL EFFICIENCY-C.E. 0

0.004 mg S02 per

PM IO EMISSION FACTOR (with wiu)- E.F. 6 gM*4,r

Source ofEmission Factor' *0*0

FUEL PARAMETER (% ash or % stdfur) - FP 0.0469

OPM 10 CONTROL DEVICE CODE' 000

Avg. PM IO CONTROL EFFICIENCY-C.E 0 %

0.23 vnapmloper

TRS EMISSION FACTOP (with wiu@- E.F. MA

source orEntission Factor'

T'RS CONTROL DEVICE CODE'

Avg. TRS CONTROL EFFICIENCY-C.E-

PB EMISSION FACTOR(.i& wiu)- E-F N/A

Soume ofEmission Facw'

PB CONTROL DEVICE CODE'

gAvg. PB CONTROL EFFICIENCY-C.E.

mm Ps per
BAMS FOOt CONTROL EFFICIENCIES: _--Omd ft EPA RMA=*_ Ombd (oft* _d1WV; _-MwW _
W- (dawnbe an
Pop 3
1. AP-42; ST- Stock Tat CEMS; F - Fodwd Facftr (EPA swxkwd bcbr *cm AIPM; 0 -
Olhw (Owerbe an "pwvft Lloot use subjed JD DEO apprwAQ
Z See - ' , cadn kW in Ap@
3. Note cm.b offbwicy wg be zwo N tom n ria cmbmi dovmm OR 90 WiUbn %Mc 80=M f
Or (i.e. EF Is kMnUftd to bm 'wkh Om*
4. ANNUALEMISSIONS-ANNUALTHRUPUTxEFxFPx(1/200MX(IOD-CEYIW.OZOMEMISSIONS-DAILYT
HRUPVrxEFxFPx(ICO@MIDD

Due to tw fact tMt this is on emergency goneratDr. the achM hrs run dow ids by
 WM number of opomting doys was uwd CLe. NOT basW on 24 houriday opomtion)
Afthough gallonsthr is provkiod hwe ma requested, emksion calculations wme bas
ed on houm operated since ornission Mctois are in unft of grams per hp-hr
- Based on ManufacunWa Oats for Volvo 500 kW Dmd generator, Modd 5W IM

01 -ON 1: EMISSION FACTOR METHOD (c- @ed)

REGISTRATION *- 51-059-0056' 7Q151 POINT NO. -nl-Dl through 08-14 (all itnits)
 SCC NO. AJI units

THRUPUT(-@m.zitz)
NO. OPERATTNG DAYS
NO. OPEELATTNG HOURS PER DAY
DAELY THRUPUT(vm /dro
HAP EMSSION FACTOR(.ith u)-F F NA
Soumc ofEmission Factor
IHAP CONTROL DEVICE CODE'
Lvg. HAP CONTROL EFFICIENCY-cs

HAP ENUSSION FACrORtwith wtitz)-F F. NA
Source of Emission Factor 1
HAp CONTROL DEVICE CODE 2

g. HAP CONTROL EMCEENCY-C.E.
KM Po
FACTOR(*,& vr.W-E.F. NA
Soume ofEmission Factor 1
HAP CONTROL DEVICE CODE'
Avg. HAP OONTROL EMCIENCYI-c.E.

HAP ENffSSION FACTOR(wir& ft)-E.F. NA
Source ofEmission Factor 1
HAP CONT'ROL DEVICE CODE'
. HAP CONTROL EFFICIENCY-ciE.

HAP EIVGSSION FACTORtwhh M)-E.F. NA
Source ofEmission Factor 1
HAP CONT'ROL DMCE CODE'
lAvg. HAP CONT'ROL EFRCEENCY-C.E.
Pff
HAP ENUSSION FACTOF4.-hh eein)-Er NA
Source ofEndssion Factor 1
HAP CONT'ROL DEVICE CODE'
.,Avg. HAP CONTROL EMCIENCY-cm

USIS FOR CONTROL EFFICUENCIES: _tsoW (by EPA Relaw F 1; _4@%04 -nMMWW bOon.; (doom" on sepowA owea.
I -AP42; ST- Stock TW CEMS; F - F 1, Famr (EPA stis Kim fackm ftm AIRS); 0 - O rm (dncfto on Ish"t u" - tD DEQ approvw) P"e 5
2. See com device =do* bood in Appwwk
3. NoW com emcmncY wiN be zom r two is no conbul dwm OR to bcbr swourft for wo b s P.m. EF Is "B to be NM =srohn.
4. ANNUALEMISSK)NS-ANNUALTHRUPUTxEFxFPx(IrMW)x(IOD-CE)MWOZONEEMSVONS-0NLYTHRUP LffxF-Fxmx(ioD.CE)MOD
NOTE: HAP Calculabons are included within the VOC calculabons, therefbre are n ot captured here

.... # I J.-J14.0
"3TION 1: EMISSION FACTOR METHOD lued)
STACK NUMBER: al REGISTRATION

STACK HEIGFrT (ft) 58
STACK DIAMETER (ft) 2
EXIT GAS TEMPERATURE F) 120-150
EXIT GAS VELOCITY (ft per sownd) 8
ELEVATION (ft above sea krvel) 288
GAS FLOW RATE (cu. ft pw mimrte) 1500

STACK NUMBER. 02

STACK HEIGFIT (ft) 58
STACK DIAMETER (ft) 2
EXIT GAS TEMPERATURE (' F) 12D-150
EXrT GAS VELOCITY (ft per second) 8
ELEVATION (ft above sea kwal) 288
GAS FLOW RATE (cu. ft per minute) 1500
STACK NUMBER:

STACK HEIGHT (ft) 58
STACK DIAMETER (ft) 2
EXIT GAS TEMPERATURE F) 12G-150
EXIT GAS VELOCITY (ft per second) 6
ELEVATION (ft above sea levol) 288
GAS FLOW RATE (cu. ft per minute) 1500
STACK NUMBER: 04

STACK HEIGFrT (ft) so
STACK DIAMETER (ft) 2.5
EXIT GAS TEMPERATURE (' F)
EXIT GAS VELOCITY (ft per seeDnd)
ELEVATION (ft above son WM) 288
GAS FLOW RATE (cu. ft per miriute)

STACK NUMBER: 09
-1 - ---- IV Il

STACK HEIGHT (ft) OUT OF SERVICE
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EXIT GAS TEMPERATURE(* F)
EXIT GAS VELOCITY (ft per socotxf)
ELEVATION (tt above am Wid)
GAS FLOW RATE (cu. ft per minLft)
VVIII have to be debwndned by stock tnbng or other wwUmd
Pop 7

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'90N 1: EMISSION FACTOR METHOD id)

STACK NUMBER: REGISTRATIoN 1-059-0066,70191

-STACK HEIGKr (ft) 58
STACK DIAMETER (ft) 0.5
EXIT GAS TEMPERATURE F)
-EXIT GAS VELOCITY (ft per seaxW)
ELEVATION (ft above sea Jove[) 288
GAS FLOW RATE (cu. ft per minute)
STACK NUMBER: 07

-STACK HEIGFrr (ft) 30
STACK DIAMETER (ft) 0.60
-EXIT GAS TEMPERATURE (o F)
EXIT GAS VELOCrrY (ft per second)
ELEVATION (ft above sea N") 288
GAS FLOW RATE (cu. ft per minute)
STACK NUMBER: as

STACK HEIGFrr (ft) 58
STACK DIAMETER 0.67
EXIT GAS TEMPERATURE(' F) '1035
EXrr GAS VELOCFTY (ft per seemid) 451
ELEVATION (ft above sea level) 298
GAS FLOW RATE (cu. ft per minute)
STACK NUMBER:

STACK HEIGHT (ft)
STACK DIAMETER (ft)
EXIT GAS TEMPERATURE (o F)
EXIT GAS VELOCITY (ft per sownd)
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GAS FLOW RATE (cu. ft per minute)
STACK NUMBER:

STACK HEIGF(T (ft)
STACK DIAMETER (ft)
EXIT GAS TEMPERATURE (I F)
EXIT GAS VELOC[TY (ft per second)
ELEVATION (ft above wo Wwo
GAS FLOW RATE (cu. ft pw minute)
WVIII have to be determined by aMck toedng or other fnethod
Pne 7

APPENDIX B
NO. RACT Consent Agreements

NVRO-031-98

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Northern Virginia Regional office
13901 Crown Court
Woodbridge VA 22193
(703) 583-3800
FAX (703) 583-3801
@j

CONSENT AGREEMENT

WITH

Washington Gas Light Company
6801 Industrial Road
Springfield, Virginia 22151

Registration-No. 70151

SECTION A: Purpose

This Agreement establishes a Reasonably Available Control Technology (RACT) standard for Washington Gas Light Company, located in Springfield, Virginia, for the control of nitrogen oxide (NOx) emissions in the Northern.Virginia Ozone Nonattainment Area as required by 9 VAC 5-40-310 of the State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution. This RACT standard shall be the basis for Nox emissions control for this plant.

SECTION B: References

Unless the context indicates otherwise, the following words and terms have the meanings assigned to them below:

"Agreement" means this Consent Agreement.

"Board" or "SAPCE" means the @tate Air Pollution Control Board, a collegiate body of the Commonwealth of Virginia described in 10.1-1301 of the Code. Particular powers and duties of the Board are described in Section C of this document.

"Code" means the Code of Virginia.

"DEQ" means the Department of Environmental Quality, an agency of the Commonwealth described in 10.1-1183 of the

Code.

"Director" means the Director of the Department of Environmental Quality. Particular powers and duties of the Director are described in Section C of this document.

"EPA" means the United States Environmental Protection Agency.

"Major Stationary Source" means any stationary source which emits, or has the potential to emit loo tons per year or more of any pollutant subject to regulation under the federal clean air act.- or 50 tons per year or more of volatile organic compounds or nitrogen oxides in ozone nonattainment areas classified as serious in 9 VAC 5-20-204 of the SAPCB Regulations. The area in which the affected facility is located is a nonattainment area classified as serious in 9 VAC 5-20-204 of the SAPCB Regulations.

"New source review program" means a program for the preconstruction review and permitting of new stationary sources or expansions to existing ones in accordance with regulations promulgated to implement the requirements of H 110 (a)(2)(c), 165 (relating to permits in prevention of significant deterioration areas) and 173 (relating to permits in nonattainment areas) of the federal Clean Air Act.

"Non-CTG" means a source type for which the EPA has not issued a control Technique Guideline (CTG), and thus has not established RACT for that source type.

"NOx" means nitrogen oxides as defined by 9 VAC 5-10-20 of the SAPCB Regulations.

'INSCR" means Nonselective Catalytic Reduction.

"Reasonably Available Control Technology" or "RACT" means the lowest emission limit that a particular source is capable of meeting by the application of control technology that is both reasonably available, as well as technologically and economically feasible.

"Regional Director" means the Director of the Northern Virginia Regional Office of the Department of Environmental Quality, 13901 Crown Court, Woodbridge, Virginia 22193.

"SAPCB Regulations" means the State Air Pollution Control Board Regulations' for the Control and Abatement of Air Pollution.

"SIP" means the State Implementation Plan.

"Theoretical potential to emit" means the maximum capacity of a stationazy source to emit a pollutant under its physical and operational design. It is based on emissions at design capacity or maximum production and maximum operating hours (8,760 hours per year) before add-on controls, unless the source is subject to state and federally enforceable permit conditions which limit production rates or hours of operation.

"VOCII means volatile organic compounds as defined by 9 VAC 5-10-20 of the SAPCB Regulations.

"Washington Gas", or "affected facility" means Washington. Gas Light Company located in Springfield, Virginia which is located in Fairfax County.

SECTION C: Authorit

1. Chapter 13 of Title 10.1 of the Code creates the Board and vests in it the authority to supervise and control various aspects of air pollution in the Commonwealth. Among the Board's powers is the authority to promulgate regulations "abating, controlling and prohibiting" air pollution, found in 9 10.1-1308 of the Code.

2. Pursuant to its authority, the Board has promulgated the SAPCB Regulations, which first took effect March 17, 1972 and have been periodically amended.

3. Pursuant to S 10.1-1307 D of the Code, the Board has the authority to issue orders to diminish or abate the causes of air pollution and to enforce its regulations. Orders of the Board are enforceable pursuant to 10.1-1316 and 10.1-1320 of the Code.

4. The Director is the executive officer of the Board. Under 10.1-1307.2 A of the Code, the Director is to perform those duties required of him by the Board. Additic'nally under 10.1-1307.3 of the Code, the Director has such powers to supervise, administer and enforce the provisions of Chapter 13 of Title 10.1 of the Code, as well as the regulations and orders of the Board, as are conferred upon him by the Board. The powers and duties conferred and imposed upon the Director under 16.1-1307.2 and 10.1-1307.3 of the Code are continued under 10.1-1185 of the Code.

5. Under 10.1-1107.2 B of the Code, the Director may bd@.

vested with the authority of the Board when it is not in session, subject to such regulations or delegation as may be prescribed by the Board. 9 VAC 5-20-130 of the SAPCB Regulations contains the Delegation of Authority from the Board to the Director. In subsection C 1 of 9 VAC 5-20-130 the Director is given the authority, with some exceptions, to act for the Board when it is not in session and to issue consent orders and emergency special orders.

SECTION D: Findincro

1. Washington Gas operates a natural gas powered cogeneration facility, consisting of six (6) generators and three (3) boilers, in Springfield, Virginia which is located in Fairfax County.

2. 9 VAC 5-40-300 and 9 VAC 5-40-310 of the SAPCB Regulations requires RACT for all non-CTG major stationary sources with potential VOC emissions of 25 tons per year or greater and NOx emissions of 50 tons per year or greater in the Northern Virginia Ozone Nonattainment Area, which includeB the Cities of Alexandria, Fairfax, Falls Church, Manassas, Manassas Park, and the counties of Arlington, Fairfax, Loudoun, Prince William and Stafford.

3. Washington Gas was determined to be a potential non-CTG major stationary source of NOx emissions in the Northern Virginia Ozone Nonattainment Area.

4. On May 30, 1995, the Board notified Washington Gas of its requirement to develop a RACT standard for NOx emissions from the affected facility.

5. Washington Gas submitted a proposed RACT determination dated June 28, 1995, to the DEQ on June 30, 1995.

6. The DEQ provided comments to Washington Gas, regarding their proposed RACT determination, on July 10, 199s.

7. Washington Gas submitted a RACT analysis dated October 10, 1995, to the DEQ on October 24, 1995.

8. The DEQ provided comments to Washington Gas, regarding their RACT analysis,-on December 20, 1995.

9. A meeting between DEQ and Washington Gas was held January 19, 1996, in order to discuss Washington Gas, RACT analysis..'

10. Washington Gas submitted a revised, January 31, 1996, RACT analysis to the DEQ on February 1, 1996.

11. In a March 6, 1996, letter to Washington Gas, the DEQ gave tentative approval of the revised January 31, 1996, RACT analysis provided that a revised Section 12.0 is incorporated into the document. DEQ requested a copy of revised Section 12.0 prior to the final RACT analysis being submitted to DEQ.

12. In a March 26, 1996, letter to Washington Gas,-the DEQ gave approval of revised Section 12.0. DEQ requested copies of the final approved RACT analysis be submitted to DEQ.

13. DEQ received Washington Gas, final RACT analysis on April 3, 1996.

14. In a July 11, 1996, newspaper advertisement, the public was notified of DEQ's intent to hold an August 15, 1996, public hearing concerning Washington Gas' proposed RACT determination.

15. DEQ held a public hearing on August 15, 1996, in order to obtain comments concerning Washington Gas' proposed RACT determination. No comments were submitted within the defined comment period.

16. DEQ sent copies of the Consent Agreement to Washington Gas on December 5, 1996, for signature.

17. Upon DEQ's signature of January 13, 1997, the Consent Agreement became affective.

18. In a February 28, 1997, meeting between DEQ and Washington Gas, Washington Gas representatives informed DEQ that the installation of the L-E technology was not working as expected and that different technologies would need to be evaluated.

19. In an April 14, 1997, phone conversation between DEQ and Washington Gas, DEQ requested that Washington Gas provide a time line for the submittal of the revised RACT analysis and the completion of the project.

20. DEQ received Washington Gas' proposed time line on April 21, 1997.

21. DEQ appro ved Washington Gas' proposed time line in a letter dated April 28, 1997.

22. DEQ received Washington Gas, new RACT analysis on June 5, 1997.

23. The DEQ provided comments to Washington Gas regarding the sUbmitted RACT analysis on June 27, 1997.

24. DEQ received Washington Gas' revised RACT analysis on July 18, 1997.

25. The DEQ provided conditional approval to Washington Gas regarding the revised RACT analysis on July 25, 1997.

26. The following cogeneration facility pre-RACT uncontrolled emissions (theoretical potential to emit) are summarized in the RACT analysis:

a. Uncontrolled Nox emissions from the facility's six (6) 930 horsepower Caterpillar G399 engines are estimated to be 807.6 tons per year.

b. Uncontrolled Nox emissions from the facility's three (3) gas-fired boilers, each with a maximum heat input capacity of 10.46 million Btu/hr, are estimated to be 19.2 tons per year.

C. Total uncontrolled Nox emissions from the affected facility are estimated to be 826.8 tons per year.

SECTION E: Agreement

Accordingly, the Board and Washington Gas agree that:

1. This Consent Agreement supersedes your Consent Agreement signed into effect on January 13, 1997, and defined by DEQ document number NrVRO-388-96.

2. RACT for the.cogeneration facility is the NOx emission rate of 2 grams per horsepower-hour. The proposed emission rate shall be obtained by the installation of Nonselective Catalytic Reduction technology (NSCR) and automat.ic air/fuel ratio controllers on the six (6) 930 horsepower engines.

3. Initial stack testing shall be conducted for nitrogen oxides emissions from a minimum of one (1) and a maximum of two (2) of the six (6) 930 horsepower Caterpillar G399 eng'ine stacks. The actual unit(s) tested shall be selected by the Regional Director. Tests shall be conducted and reported and data reduced as set forth iri 9 VAC 5-50-30 of State Regulations.

During all tests, the engine(s) shall be required to be operated at a minimum of 80* of their maximum rated Output capacity. The details of the tests are to be arranged with the Regional Director. Washington Gas shall submit a test protocol at least thirty (30) days prior to testing. Two (2) copies of the test results shall be submitted to the Regional Director within 60 days after test completion.

4. Washington Gas shall determine the surrogate parameters, differential pressure and temperature, recluired to ensure continuous compliance with the defined RACT standard. The surrogate parameters shall be determined by utilization of both stack test and portable analyzer data. The details of the surrogate parameter development and testing methods are to be arranged with the Regional Director. Two (2) copies of the results shall be submitted to the Regional Director within 60 days after test completion. As a minimum, surrogate parameters shall be re-evaluated, using portable analyzers, at a minimum of once in every 24 month period. Additionally, the surrogate parameter monitoring devises shall be calibrated and certified on an annual basis.

5. Washington Gas shall submit an annual report to the Regional Director detailing all non-compliance conditions. Washington Gas shall, at a minimum, keep a daily 109 which documents the temperature and pressure differential across the catalyst beds. The daily log shall provide sufficient information to demonstrate compliance with the conditions of this Agreement. Additionally, an annual report demonstrating compliance with all RACT requirements shall be submitted to the Regional Director, Northern Virginia DEQ Office within 30 days after the end of calendar year. Detailed documentation of the daily log shall be maintained at the facility for the most recent five (5) years and made available to the DEQ upon reasonable notice at any time.

6. Washington Gas shall comply with all applicable SAPCB Regulations including the requirements for monitoring, notification, recordkeeping, reporting, maintenance, and malfunction.

7. At any time in the future, should Washington Gas plan any modifications (in the context of the new source review Drogram) of the affected facility covered by this Ag@eement,'Washington Gas shall have the right to-

apply to the Board for a new source review permit and the Board may consent to such modifications provided such modifications will meet all of the new source review permit program regulatory requirements in existence at that time.

8. The Board may modify, rewrite, or amend this Agreement with the consent of Washington Gas, for good cause shown by Washington Gas, or on its own motion provided approval of the changes is accomplished in accordance with SAPCB regulations, the Administrative Process Act (9-6-14:1 et. seq.) and 40 CFR Part 51 (Requirements for Preparation, Adoption, and Submittal of Implementation Plans).

9. Upon the terms and conditions of this Agreement being incorporated into a federally enforceable operating(permit, enforcement shall take place through the operating permit program in lieu of this Agreement. It shall be noted that the preceding statement does not preclude DEQ's right to take enforcement action through this document if it deems necessary.

10. So long as this Agreement remains in effect, Washington Gas waives the right to any hearing pur'suant to H 9-6.14:11 and 9-6.14:12 of the Code and to judicial review of any issue of fact or law contained herein. Nothing herein, however, shall be construed as a waiver of the right to a hearing or to judicial review of any action taken by the Board to enforce this Agreement.

11. Failure'by Washington Gas to comply with any of the terms of this Agreement shall constitute a violation of an Order of the Board. Nothing herein shall waive the initiation of appropriate enforcement actions or the issuance of additional orders as appropriate by the Board as a result of such violations. Nothing herein shall affect appropriate enforcement actions by any other federal, state, or local regulatory authority.

12. Washington Gas declares it has received fair and due process under the Administrative Process Act (9-6.14:1 et. seq.).

13. This Agreement shall-become effective upon signature by both parties and sha'll continue in effect indefinitely or until otherwise terminated by the Board.

The foregoing Consent Agreement has been executed on behalf of the STATE AIR POLLUTION CONTROL BOARD of the COMMONWEALTH OF VIRGINIA and on behalf of Washington Gas Light Company, each by its duly authorized representatives, or self, on the dates indicated below.

DEPARTMENT OF ENVIRONMENTAL QUALITY
OF THE COMMONWEALTH OF VIRGINIA

BY:
(date) @omas L. Hopkins
#ILODirector

WASHINGTON GAS LIGHT COMPANY

March 26, 1998 BY:
(date) Aibhara---;0. Cook
Vice President,
operations Technical Support

STATE OF %JA'g;@W.
CITY/COUNTY

The foregoing instrument was acknowledged before me this day of Y@"M) I 199,P by Richard J. Cook, Vice President, Operations Technical Support, of Washington Gas Light Company, a Virginia Corporation, on behalf of the Corporation.

My commissioxi expires X

'4414" 14. 2q
'40
Nktary Public

NVRO-047-98

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVMONMENTAL QUALrFy
Northern Virginia Regional Office
13901 Crown Court
Woodbridge, VA 22193
(703) 583-3800
FAX (703) 583-3801

CONSENT AGREEMENT

wilH

Washington Gas Light Company
6801 Industrial Road
Springfield, Virginia 22151

Registration No. 70151

SECTION A: Pumose

This Agreement establishes a compliance schedule for the installation and testing of Nonselective Catalytic Reduction control equipment required by the Reasonably Available Control Technology (RACT) standard for Washington Gas Light Company, located in Springfield, Virginia, for the control of nitrogen oxide (NOx) emissions in the Northern Virginia Ozone Nonattainment Area as required by 9 VAC 5-40-310 of the State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution.

SECTION B: References

unless the context indicates otherwise, the following words and terms have the meanings assigned to them below:

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"Major Stationary Source" means any stationary source which emits, or has the potential to emit 100 tons per year or more of any pollutant subject to regulation under the federal clean air act, or 50 tons per year or more of volatile organic compounds or nitrogen oxides in ozone nonattainment areas classified as serious in 9 VAC 5-20-204 of the SAPCB Regulations. The area in which the affected facility is located is a nonattainment area classified as serious in 9 VAC 5-20-204 of the SAPCB Regulations.

ViNew source review program" means a program for the preconstruction review and permitting of new stationary sources or expansions to existing ones in accordance with regulations promulgated to implement the requirements of H 110 (a)(2)(C), 165 (relating to permits in prevention of significant deterioration areas) and 173 (relating to permits in nonattainment areas) of the federal Clean Air Act.

"Non-CTG" means a source type for which the EPA has not issued a Control Technique Guideline (CTG), and thus has not established RACT for that source type.

"NOx" means nitrogen oxides as defined by 9 VAC 5-10-20 of the SAPCB Regulations.

IINSCR" means Nonselective Catalytic Reduction.

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SECTION C: Authori

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2. Pursuant to its authority, the Board has-promulgated the SAPCB Regulations, which first took effect March 17, 1972 and have been periodically amended.

3. Pursuant tO 10.1-1307 D of the Code, the Board has the authority to issue orders to diminish or abate the causes of air pollution and to enforce its regulations. orders of the Board are enforceable pursuant to SS 10.1-1316 and 10.1-1320 of the Code.

4. The Director is the executive officer of the Board. Under 10.1-1307.2 A of the Code, the Director is to perform those duties required of him by the Board. Additiqnally under 10.1-1307.3 of the code, the Director has such powers to supervise, administer and enforce the provisions of Chapter 13 of Title 10.1 of the Code, as well as the regulations and orders of the Board, as are conferred upon him by the Board. The powers and duties conferred and imposed upon the Director under SS 16.1-1307.2 and 10.1-1307.3 of the Code are continued under 10.1-1185 of the Code.

S. Under S 10.1-1307.2 B of the Code, the Director may be vested with the authority of the Board when it is not in session, subject to such regulations or delegation as may be prescribed by the Board. 9 VAC 5-20-130 of the SAPCB Regulations contains the Delegation of Authority from the Board to the Director. In subsection c I of 9 VAC 5-20-130 the Director is given the authority, with some exceptions, to act for the Board when it is not in session and to issue consent orders and emergency special orders.

SECTION D: Findinqs

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2. 9 VAC 5-40-300 and 9 VAC 5-40-310 of the SAPCB Regulations requires RACT for all non-CTG major stationary sources with potential VOC emissions of 25 tons per year or greater and NOx emissions of 50 tons per year or greater in the Northern Virginia Ozone Nonattainment Area, which includes the Cities of Alexandria, Fairfax, Falls Church, Manassas, Manassas Park, and the counties of Arlington, Fairfax, Loudoun, Prince William and Stafford.

3. Washington Gas was determined to be a potential non-CTG major stationary source of Nox emissions in the Northern Virginia Ozone Nonattainment Area.

4. On May 30, 1995, the Board notified Washington Gas of its requirement to develop a RACT standard for Nox emissions from the affected facility.

5. In a March 26, 1996, letter to Washington Gas, the DEQ gave approval of Washington Gas's RACT analysis.

6. In a December 1996 consent agreement, document number NVRO-3e8-96, between DEQ and Washington Gas, it was determined that the RACT standard for Washington Gas, cogeneration facility is the installation of Low Emission Combustion technology (L-E) on the six (6) 930 horsepower engines.

7. Upon DEQ's signature of January 13, 1997, the Consent Agreement became affective.

8. In a February 28, 1997, meeting between DEQ and Washington Gas, Washington Gas representatives informed DEQ that the installation of the L-E technology was not working as expected and that different technologies would need to be evaluated.

9. The DEQ provided conditional approval to Washington Gas regarding the revised RACT analysis on July 25, 1997.

10. In a March 1998 consent agreement, document number NVRO-031-98, between DEQ and Washington Gas, it was determined that RACT for the cogeneration facility is the NOx emission rate of 2 grams per horsepower-hour. The proposed emission rate shall be obtained by the installation of Nonselective Catalytic Reduction technology (NSCR) and automatic air/fuel ratio controllers on the six (6) 930 horsepower engines.-

SECTION E: Acrreement

Accordingly, the Board and Washington Gas agree that:

1. This Consent Agreement supersedes your Consent Agreement signed into effect on January 13, 1997, and defined by DEQ document number NVRO-399-96.

2. The installation of Nonselective Catalytic Reduction technology (NSCR) and automatic air/fuel ratio controllers on the six (6) 930 horsepower engines shall be completed within 180 days of this agreement becoming effective. An extension may be granted by the Regional Director, upon the satisfactory demonstration that the extension is justified.

3. Initial stack testing shall be conducted for nitrogen oxides emissions from a minimum of one (1) and a maximum of two (2) of the six (6) 930 horsepower Caterpillar G399 engine stacks within 60 days of the completion of the defined NSCR installation. The actual unit(s) tested shall be selected by the Regional Director. Tests shall be conducted and reported and data reduced as set forth in 9 VAC 5-50-30 of State Regulations. During all tests, the engine(s) shall be required to be operated at a minimum of 80t of their maximum rated output capacity. The details of the tests are to be arranged with the Regional Director. Washington Gas shall submit a test protocol at least thirty (30) days prior to testing. Two (2) copies of the test results shall be submitted to the Regional Director within 60 days after test completion.

4. Washington Gas shall determine the surrogate parameters, differential pressure and temperature, required to ensure continuous compliance with the defined RACT standard. The surrogate parameters shall be determined by utilization of both stack test and portable analyzer data. The details of the surrogate parameter development and testing methods are to be arranged with the Regional Director. Two (2) copies of the results shall be submitted to the Regional Director within 60 days after test completion. As a minimum, surrogate parameters shall be re-evaluated, using portable analyzers, at a minimum of once in every 24 month period. Additionally, the surrogate parameter monitoring devises shall be calibrated and certified on an annual basis.

S. The Board may modify, rewrite, or amend this Agreement with the consent of Washington Gas, for good cause shown by Washington Gas, or on its own motion provided such modifications will meet all regulatory requirements in existence at that time.

6. So long as this Agreement remains in effect, Washington Gas waives the right to any hearing pursuant to H 9-6.14:11 and 9-6.14:12 of the Code and to judicial review of any issue of fact or law contained herein. .Nothing herein, however, shall be construed as a waiver of the right to a hearing or to judicial review of any action taken by the Board to enforce this Agreement.

7. Failure by Washington Gas to comply with any of the terms of this Agreement shall constitute a violation of an Order of the Board. Nothing herein shall waive the initiation of appropriate enforcement actions or the issuance of additional orders as appropriate by the Board as a result of such violations. Nothing herein shall affect appropriate enforcement actions by any other federal, state, or local regulatory authority.

8. Washington Gas declares it has received fair and due process under the Administrative Process Act (9-6.14: 1 et. seq.) .

9. This Agreement shall become effective upon signature by both parties and shall continue in effect until all conditions have bee'n met or until otherwise terminated by the Board.

The foregoing Consent Agreement has been executed on behalf of the STATE AIR POLLUTION CONTROL BOARD of the COMMONWEALTH OF VIRGINIA and on behalf of Washington Gas Light Company, each by its duly authorized representatives, or self, on the dates indicated below.

DEPARTMENT OF ENVIRONMENTAL QUALITY
OF THE COMMONWEALTH OF VIRGINIA

BY: *'%,
6@@
(date) Thomas L. Hopkins
Director

WASHINGTON GAS LIGHT COMPANY

March 26, 1998 BY:
(date) Ri chard(2.-) Eook
Vice President,
Operations Technical Support

STATE OF
CITY/CO

The a6m go n instrument was acknowledged before me this d y f '-fAghtt) I 1998 , by Richard J. Cook, Vice President, Operations Technical Support, of Washington Gas Light Company, a Virginia Corporation, on behalf of the Corporation.

MY commission expires

lotary Public

APPENDIX C
NO,, RACT Parametric Monitoring Plan

Washingtor 6801 Industrial Road
Gas Springfield, Virginia 22151

I I June 1999

Mr. Teny J. Godar, P.E.
Air Permit Manager 'JLiN 14 1999

Virginia Departinent of Envirorunental Quality Nonhwn 'IA. ftig-jon
13901 Crown Court Dept. of Env. --Iualiv;
Woodbridge, Virginia 22193

Dear Mr. Godar:

Attached is our revised parametric monitoring plan for our Springfield Operati ons Center,
regist-ation niunber 70 1 5 1. if you have any questions or need any additiona l infonnafion, please call
me at (703) 750-5558 or Robert Clark at (703) 750-5972.

Sincerely,

L

Mary Jean B
Area Head,
Enviromnent & Quality Assurance

WashingtOn Gas will take daily temperatm and pressure readings on each opemtin g engine-
Differential Pressure readings will be used primarily to determine when the ca talyst beds have
exhausted or fouled, and secondarily to assess the engine's performance. If t he differential pressure
observed is below 1.5 inches of water coliimn, Washington Gas will begin troub leshooting the
system to detennine the cause of the "short circuifing" and the engine wiU not be used for primary
production until the problem is solved. If the differential pressure observed across the catalyst bed
is above the differential pmssure curve, the following remedial actions will b e undertaken.

1) Measure the differential pressure with a cWl'brated gauge with connections that are clear of
any obstructions, condensation, etc.
2) If the pressure is stUl in excess of the indicated value, use the portable analyzer to measure
the NOx emissions to ensure that the prelpost catalyst composition is correct. If NOx
emissions are greater than 550 ppm, perform engine diagnostics to include the catalyst
system. If emissions are less dm 550 ppm, call Johnson Matthey for consultati on.
3) Adjust engine's air to fuel ratio and re-measure the differential pressure and temperature.
Re-measm NOx emissions. If pressure is stiR excessive, continue engine diagno stics and
make necessary repairs. (Only if emissions are greater than 550 ppm)
4) Washington Gas wfll not use the engine for pfimary production (except durin g engine
diagnostics) until the differential pressure is below the desired value.

Differential temperature readings wW provide the means for determining whether or not the reaction
within the catalyst is acceptable. If the differential temperature observed a cross the catalyst bed is
below the temperature curve, the following remedial actions wiU be undertakerL

Verify that all thermocouple wiring and comections are secure and m-check the differential
temperature.
2) If temPemture is still below the desired value, use the portable analyzer t o measure the NOx
emissions to ensure that the pre/post catalyst composition is coffect. If NOx emissions are
greater than 550 ppm, perform engine diagnostics to include the catalyst syste m.
3) Adjust the engine's air-fuel mtio and re-measure the differential temperatu re. If the
tempemture remains below the curve, continue to troubleshoot the engine and ma ke
necessary repairs.
4) Washington Gas will not use the engine for primary production (except durin g engine
diagnostics) until the differential tempemture is above the desired value.

In addition to the daily re@dings, Washington Gas will verify the differential tempemture curves for
each of the six engines dvery six months, using the portable analyzer. The cu rves will be verified
at 400, 500, and 600 kW. If it is necessary to adjust the curve either up or down, written

documentation will be forwarded to the DEQ within 60 days for review and/or co
mments.

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