



April 11, 2001

MAY 2 2001

BUREAU OF AIR REGULATION

Mr. Clair H. Fancy, P.E. Bureau of Air Regulation Florida Department of Environmental Protection Twin Towers Office Bldg. 2600 Blairstone Tallahassee, FL 32399-2400

Reference:

Facility: 0830070

Compressor Station No. 17, Silver Springs, Marion County

Dear Mr. Fancy:

**Application for Air Construction Permit** Subject:

Florida Gas Transmission Company (FGT) is proposing to install a new Pignone PGT-10B compressor turbine and to modify an existing 2,000 bhp reciprocating engine at the above referenced facility.

The facility is a major source under New Source Review definitions and the proposed new turbine has NO<sub>x</sub> emissions exceeding 40 tpy. The proposed modification to the existing reciprocating engine will create reductions in NO<sub>x</sub> emissions so that the net emissions do not exceed levels that are significant under Prevention of Significant Deterioration requirements. Therefore, a state only construction permit is required.

Enclosed is an Application with supporting documentation for an Air Construction Permit for the proposed modifications. FGT understands that no processing fee is required since this facility is operated under a Part 70 Permit.

If you have any questions or need additional information, please call me at (800) 381-1477.

Sincerely,

Jim Thompson

Project Manager, Environmental

1 haysser

CC: James Alexander, Phase V w/o attachments

Jim Thompson, Phase V8

**Q**3

Clay Roesler, FGT V. Duane Pierce, Ph.D., AQMcs, LLC Les Cockram, Compressor Station No. 17

# Florida Gas Transmission Company

**Phase V Expansion Project** 

**Compressor Station No. 17** 

# APPLICATION For AIR CONSTRUCTION PERMIT

**April 2001** 

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#### 1.0 INTRODUCTION

Florida Gas Transmission Company (FGT), a Delaware Corporation and ENRON/EL PASO affiliate of Houston, Texas, is proposing to expand its existing natural gas pipeline facility near Silver Springs in Marion County, Florida (Compressor Station No. 17). This proposed modification is part of FGT's Phase V Expansion Project, aimed at increasing the supply capacity of FGT's network servicing domestic, commercial, and industrial customers in Florida. The scope of work for the Phase V Expansion Project includes expansion through the addition of state-of-the-art compressor engines at eight existing compressor stations and the development of two new compressor stations within the State of Florida. The basic project components include:

- Mainline loops, additions, and replacements;
- Lateral loops and additions;
- Meter station additions, modifications, and expansions;
- Regulator additions, modifications, and expansions; and
- Compressor station additions and modifications.

Compressor Station No. 17 is located in Marion County, Florida, approximately 17 miles northeast of Silver Springs on County Highway 314. Figure 1-1 shows the location of the existing compressor station.

The proposed expansion consists of the installation of a new 15,700 brake horsepower (bhp), natural-gas-fired, turbine compressor engine and the replacement of two existing gas fired emergency generators with a single 585 bhp natural gas fired emergency generator. The proposed compressor engine is a Pignone PGT10B equipped with dry low NO<sub>x</sub> (oxides of nitrogen) combustion that will be used solely for transporting natural gas by pipeline for distribution to markets in Florida.

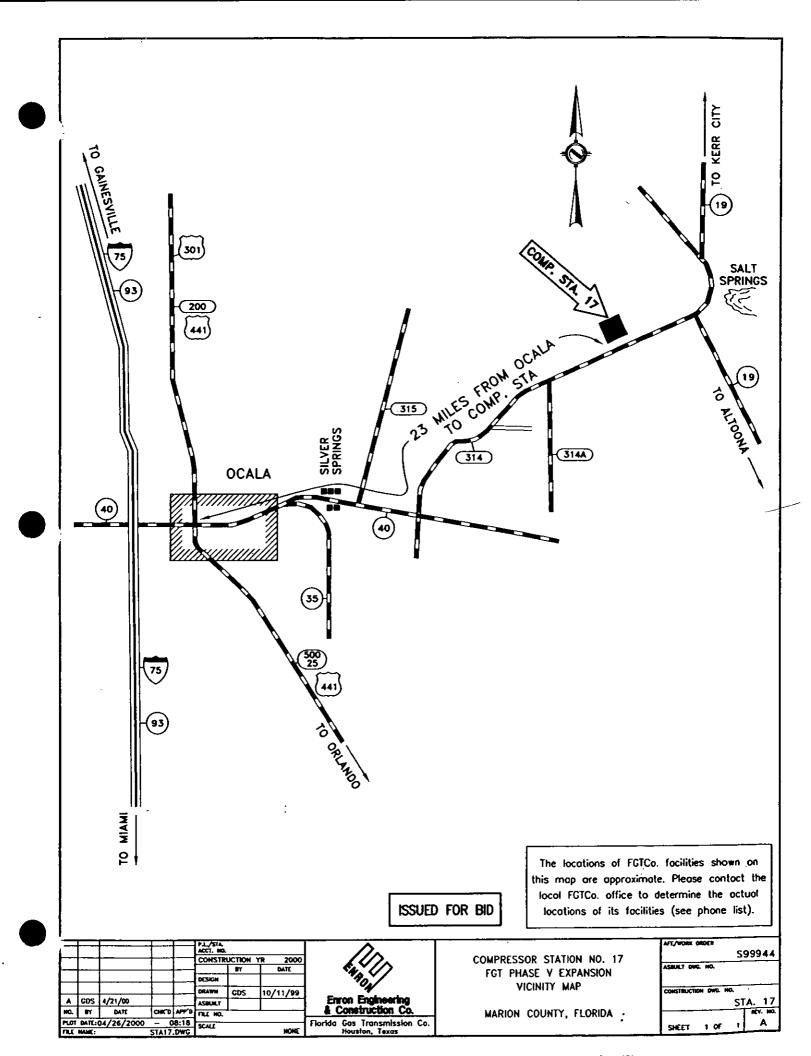
Based on these projected new annual emission rates, the proposed new sources will potentially constitute a significant modification at an existing major stationary source under Prevention of significant Deterioration (PSD) regulations. However, FGT is also proposing to reduce the NO<sub>x</sub> emissions from an existing 2,000 bhp reciprocating compressor engine by modifying the engine. Based on the projected net annual emission rate change, there will be no PSD (Prevention of Significant Deterioration) significant increase in the emissions of any contaminant and a state only construction permit is required.

Engineering designs for the proposed expansion project include selection of a turbine incorporating dry low NO<sub>X</sub> combustion technology with NO<sub>X</sub> emissions at 25 ppmv. This dry low

 $NO_X$  technology for control of  $NO_X$  emissions would represent Best Available Control Technology (BACT) for the proposed new gas turbine engine under PSD requirements.

This narrative contains three additional sections. Descriptions of the existing operation at FGT's Compressor Station No.17, the proposed new turbine, the proposed new emergency generator and the proposed reciprocating engine modifications are presented in Section 2.0. The air quality review requirements and applicability of state and federal regulations are discussed in Section 3.0. References are included in Section 4.0.

FDEP permit application forms are presented in Attachment A. Attachment B contains a plot plan of the facility. Attachment C contains vendor information, Attachment D contains emission calculations and Attachment E contains a test report for the current emissions of the engine to be modified and a summary of a test of a similar unit that was modified.



#### 2.0 PROJECT DESCRIPTION

A plot plan of FGT's Compressor Station No. 17, showing the location of the plant boundaries, the existing emission sources, and the location of the proposed engine addition, is presented in Attachment B. The following sections provide a description of the existing operations at this location, as well as a description of the proposed project.

## 2.1 Existing Operations

FGT's existing Compressor Station No. 17 consists of four 2,000 bhp and one 2,400 bhp natural-gas-fired reciprocating internal combustion (IC) engines. Table 2-1 summarizes engine manufacturer, model, and the date of installation for each of the existing engines. The original installation was made in 1966 (Compressor Engines 1701 through 1704). An addition referred to as Phase II was constructed in 1991 (Compressor Engine 1705) and was subject to PSD review. Existing engine 1704 is being modified to reduce NO<sub>X</sub> emissions as part of this expansion project.

The existing facility also has supporting equipment including lube and used oil storage tanks, air compressors and emergency generators.

## 2.2 Proposed Compressor Station Addition

FGT proposes to increase the horsepower capacity of Compressor Station No. 17, as part of the Phase V Expansion Project. This will involve adding one new gas-fired turbine (Compressor Engine 1706). The proposed new engine will be used to increase the volumetric delivery capacity by driving a gas compressor that is a part of a gas transmission line that transports natural gas from source wells in Texas and Louisiana for delivery throughout Florida. Without the proposed engine, it would not be possible to increase the volumetric delivery capacity necessary to meet both short and long-term demands for natural gas in Florida.

#### 2.2.1 New Compressor Turbine Engine Addition

FGT proposes to install one natural gas-fired turbine engine compressor unit and associated support equipment at Compressor Station No. 17. The turbine engine will be a Pignone PGT10B engine compressor unit rated at 15,700 bhp. Fuel will be exclusively natural gas from the FGT's natural gas pipeline. Engine specifications and stack parameters for the proposed engine are presented in Table 2-2.

This engine will be designated as Engine No. 1706. One of the existing emergency generators

is now designated as Engine No. 1706, but it is being removed as part of this project.

**Table 2-1 Summary of Existing Compressor Engines** 

Engine #	Date of Installation	Туре	Manufacturer	Model #	Brake Horse Power (bhp)
1701	1966	Reciprocating	Cooper - Bessemer	LS-8-SG	2000
1702	1966	Reciprocating	Cooper - Bessemer	LS-8-SG	2000
1703	1966	Reciprocating	Cooper - Bessemer	LS-8-SG	2000
1704	1966	Reciprocating	Cooper - Bessemer	LS-8-SG	2000
1705	1991	Reciprocating	Dresser-Rand	412KVSRA	2400

Hourly and annual emissions of regulated pollutants from the proposed engine under normal operating conditions are presented in Table 2-3. Emissions of oxides of nitrogen (NO<sub>X</sub>), carbon monoxide (CO) and non-methane hydrocarbons (NMHC) are based on the engine manufacturer's supplied data (See Attachment C).

Typically, turbine vendors do not provide information on particulate matter (PM) or sulfur dioxide (SO2) emissions; therefore, particulate matter emissions are based upon USEPA publication AP-42 Table 3.1-2a (USEPA, 2000) and emissions of SO<sub>2</sub> are based on FGT's Federal Energy Regulatory Commission (FERC) certificate limit of 10 grains sulfur per 100 cubic feet of natural gas. Hazardous air pollutant (HAP) emissions are based upon the Gas Research Institute's (GRI) HapCalc software that uses USEPA emission factors, emission factors found in research literature and emission factors based on GRI research data.

Table 2-2 Proposed Compressor Engine Specifications and Stack Parameters

Parameter	Design
Compressor Engine	1706
Туре	Gas Turbine
Manufacturer	Nuovo Pignone
Model	PGT10B
Unit Size	15,700 bhp
Heat Input <sup>a</sup>	134.77 MMBtu/hr
Maximum Fuel Consumption b	0.1296 MMscf/hr
Speed	7,900 rpm
Stack Parameters	
Stack Height	61.5
Stack Diameter	7.6 ft
Exhaust Gas Flow	215,175 acfm
Exhaust Temperature	909 °F
Exhaust Gas Velocity	79.1 ft/sec

NOTE:

acfm = actual cubic feet per minute.

bhp = brake horsepower.

MM Btu/hp-hr = million British thermal units per brake horsepower per hour.

oF = degrees Fahrenheit.

ft = feet.

ft/sec = feet per second.

MMscf/hr = million standard cubic feet per hour

rpm = revolutions per minute.

<sup>&</sup>lt;sup>a</sup> Based on vendor fuel rate value of 122.52 MM Btu/hr plus 10%

<sup>&</sup>lt;sup>b</sup> Based on heating value for natural gas of 1040 British thermal units per standard cubic foot (Btu/scf).

Table 2-3 Emissions from FGT's Proposed New Compressor Engine

Pollutant	Emission Factor	Reference	lb/hr	TPY
Nitrogen Oxides	14.1 lb/hr	Manufacturer Data	14.10	61.76
Carbon Monoxide	5.14 lb/hr @ 100% load 22.50 lb/hr @ 50% load	Manufacturer Data	15.5 <sup>a</sup>	68.1 <sup>b</sup>
Volatile Organic Compounds	0.29 lb/hr @ 100% load 1.46 lb/hr @ 50% load	Manufacturer Data	0.99 <sup>c</sup>	4.3 <sup>b</sup>
Particulate Matter*	0.0066 lb/ <b>MM</b> Btu	AP-42, Table 3.1-2a	0.89	3.9
Sulfur Dioxide*	10 grains/100 scf	FERC Limit	3.70	16.2
HAPs	Various see Attachment D	GRI HapCalc 3.0	0.75	3.3

- a) Nominal CO (annual) rate, maximum 22.50 lb/hr
- b) 100% load for 40% of time & 50% load for 60% of time
- c) Nominal VOC (annual) rate, maximum 1.46 lb/hr

All contaminants have decreasing lb/hr emission rates with decreasing engine load except CO and VOCs. The new turbine will be operated at less than 100% load at times. The load may commonly drop as low as 60% and occasionally to 50%. The CO and VOC emission rates on the PGT-10B increase with decreasing engine load. Emission rates are based on 100% load (worse case) for all contaminants except CO and VOC. CO and VOC emission rates are based on operation at 100% load for 20% of the time (1752 hr/yr) and 50% load for 80% of the time (7008 hr/yr).

#### 2.2.2 Proposed Reciprocating Engine Modifications

The following describes and explains the modifications to be made to Emission Unit 1704.

## 2.2.2.1 Background

For natural gas engines, there is small window of relative proportions of air and fuel for which combustion can occur. Too much air relative to the amount of fuel in a cylinder head will not ignite. Also, if there is not enough air relative to the amount of fuel in the cylinder head, it will not ignite.

"Rich burn" engines power most of the old pipeline compressors. This means that they mix air and fuel in proportions such that the combustible mixture is on the low air to fuel ratio side of the combustion envelope. It has been known for some time now that one of the secrets of producing less NO<sub>x</sub> in the internal engine combustion process is to increase the air manifold pressure and operate at higher air to fuel ratios. By increasing the air manifold pressure, more air is let into the cylinder head per each stroke. This means that more air is added to the same or similar parts of fuel for each "explosion" that occurs in the cylinder head. The result is lower cylinder temperatures and lower NO<sub>x</sub> levels.

Most of the original engine manufacturers (OEM's) want the users to purchase their kit for accomplishing the modifications. These kits consist of expensive jet cells, modifications to cylinder heads, a cooling system for the jet cells and sometimes a whole new turbocharger. These kits are designed to operate the engine at the high end of the air to fuel mixture window. While these kits reduce the amount of NO<sub>x</sub> formation, they are generally expensive to install, increase the maintenance of the ignition and cooling systems and reduce the reliability of the compressor engine. Furthermore, as a side effect, they sometimes reduce fuel consumption slightly.

Most compressor engines have been operated with the same OEM engine parameters since their installation. Not many users will modify the operating parameters given by the OEM. However, with the need for cleaner combustion, OEM's started modifying the parameters by increasing the air to fuel ratio with their kits. Users caught on and later began implementing non-OEM approaches. FGT's approach is to increase the air to fuel ratio incrementally to reduce the amount of NO<sub>x</sub> without the use of OEM systems. By doing this, many of the complicated, unreliable systems are not required. Since this approach generally cannot achieve the same air to fuel ratios it does not yield the same levels of NO<sub>x</sub> reduction; however, significant reductions are still achieved.

With this approach, FGT has demonstrated significant emission reductions. FGT believes it has accomplished these reductions without the compromised reliability and increased complexity of the OEM packages; however, any unit modified, will have to operate at an increased fuel consumption rate and increased maintenance intervals of the turbocharger.

Temperature is also another factor in  $NO_x$  production from an engine. Temperature, like pressure, affects density. Just as increased air pressure increases density, lower temperature increases density as well. The more dense the air, the more air that can be put into a cylinder head, and therefore the higher the air to fuel ratio of the engine and in turn, the less  $NO_x$  that will be produced. Conversely, as the ambient temperatures rises, less air is put in the engine, and more  $NO_x$  is produced. Temperatures fluctuate from season to season. However, the modification that increases air manifold pressure increases the air into the cylinder head for any ambient temperature. Thus the air to fuel ratios are higher for any air manifold temperature the engine has experienced in the past and will experience in each future year.

## 2.2.2.2 Engine Modifications

In order to reduce emissions, FGT selected an older slow speed engine (emission Unit 1704) at Compressor Station No. 17. The modifications consist of modifying the turbocharger aerodynamics and the control system of the unit. The result is lower emissions but at a cost of added fuel and harder work from the turbochargers.

The turbocharger modifications consist of removing the turbocharger and sending it to a turbocharger overhaul and manufacturing facility where the internals are modified to produce more air at higher pressures. By increasing the capability of the turbocharger to produce more air and at a higher pressure, higher air to fuel mixtures can be achieved. This means lower  $NO_x$ . The facility modifies the internals of the turbocharger with the correct aerodynamic components to produce the required air. FGT re-installs the turbocharger and re-adjusts the controls to make the compressor unit run with the modified turbocharger. The adjustment will consist of setting the air manifold pressure at a higher level than it was previously operated. In doing so, more air will enter into the cylinder for about the same amount of fuel. This will increase the air to fuel ratio. When the air manifold pressure setpoint is put into the controls, the unit is capable of operating at a higher air manifold pressure than it has in the past and the  $NO_x$  rate is reduced.

The controls modification consists of determining new engine operating settings for the modified condition, drawing curves to control the compressor unit to the desired settings, and reconfiguring the main control logic to control the compressor unit.

The basic effect of the modification on the units is increased air pressure to the engine, allowing higher air to fuel ratios. The resulting side effect on the turbocharger is that it must turn faster and will cause more backpressure on the engine. In basic terms, the turbocharger will "work harder" and is expected to require overhaul on a more frequent basis. Furthermore, the

increased backpressure requires that the engine burn more fuel to function at the same horsepower levels. Based on FGT testing results, the increased fuel consumption for the modified compressor unit at Compressor Station No. 17 will be about 10%.

Engine parameters are given in Table 2-4 and pre-modification and post-modification emission rates are given in Tables 2-5 and 2-6. Pre-modification emissions are based on stack testing conducted in October 2000. A copy of the test report is located in Attachment E. Post-modification emission rates are based upon stack testing of modified unit 1205. Unit 1205 is an engine that is identical to engine 1704 and has already received the same modifications that 1704 will receive. A test report summary for modified Unit 1205 is included in Attachment E.

Table 2-4 Proposed Modified Engine (1704) Specifications and Stack Parameters

Parameter	Design
Compressor Engine	1704
Туре	Reciprocating Engine
Manufacturer	Cooper-Bessemer
Model	LS-8-SG
Unit Size	2,000 bhp
Specific Heat Input	8,250 Btu/hp-hr
Maximum Fuel Consumption <sup>a</sup>	0.01587 MMscf/hr
Stack Parameters	
Stack Height	28 ft
Stack Diameter	1.44 ft
Exhaust Gas Flow	11,637 acfm
Exhaust Temperature	700 °F
Exhaust Gas Velocity	36.3 ft/sec

NOTE:

acfm actual cubic feet per minute.

brake horsepower. bhp

Btu/hp-hr °F British thermal units per brake horsepower per hour. =

degrees Fahrenheit.

ft feet.

ft/sec feet per second.

million standard cubic feet per hour. MMscf/hr

<sup>&</sup>lt;sup>a</sup> Based on heating value for natural gas of 1040 British thermal units per standard cubic foot (Btu/scf).

Table 2-5 Pre-modification (1704) Compressor Engine Potential Emissions

Pollutant	Emission Factor	Reference	lb/hr	TPY
Nitrogen Oxides	11.5 g/hp-hr	Test Data	50.71	222.1
Carbon Monoxide	0.99 g/hp-hr	Test Data	4.37	19.1
Volatile Organic Compounds	0.24 g/hp-hr	Test Data	1.04	4.56
Particulate Matter	0.00999 lb/MMBtu	AP-42 Table 3.2-2	0.15	0.6
Sulfur Dioxide*	10 grains/100 scf	FERC Limit	0.41	1.8
HAPs	Various see Attachment D	GRI HapCalc 3.0	0.76	3.3

<sup>\*</sup> Emissions based on vendor provided heat rate value

Table 2-6 Post-modification (1704) Compressor Engine Potential Emissions

Pollutant	Emission Factor	Reference	lb/hr	TPY
Nitrogen Oxides	8.0 g/hp-hr	Similar Unit Test Data	35.27	154.5
Carbon Monoxide	2.0 g/hp-hr	Similar Unit Test Data	8.82	38.6
Volatile Organic Compounds	0.1 g/hp-hr	Similar Unit Test Data	0.44	1.9
Particulate Matter	0.00999 lb/MMBtu	AP-42 Table 3.2-2	0.16	0.7
Sulfur Dioxide*	10 grains/100 scf	FERC Limit	0.45	2.0
HAPs	Various see Attachment D	GRI HapCalc 3.0	0.76	3.3

<sup>\*</sup> Emissions based on vendor provided heat rate value plus expected 10 % fuel use increase

## 2.2.3 Support Equipment Additions and Changes

In addition to the compressor engines, some support equipment will be installed at the site. They include:

- A new compressor building
- A new control building
- One new emergency generator to replace two existing gas-fired generators.

The location of new on-site structures is shown on the facility plot plan contained in Attachment B. The new compressor building, housing the turbine, has approximate dimensions of 40 feet wide by 78.4 feet long by 35.3 feet high. The new control building will be located south of the new compressor building. The approximate dimensions of the control building will be 11 feet wide by 45 feet long by 12 feet high. Due to the size of this building and its distance from the new exhaust stack, it will not influence dispersion of compressor engine emissions.

The new generator will be powered by a natural gas fueled, lean burn Waukesha Model H24GL rated at 440 kW (585 bhp). Engine specifications and stack parameters for the proposed engine are presented in Table 2-4 and emissions are presented in Table 2-5.

Table 2-7 Proposed Emergency Generator Engine Specifications and Stack Parameters

Parameter	Design
Compressor Engine	Gen 03
Type	Natural Gas, Lean Burn Reciprocating
Manufacturer	Waukesha
Model	H24GL
Unit Size	585 bhp
Heat Input	4.11 MM Btu/hr
Fuel Consumption <sup>a</sup>	0.00395 MMscf/h
Speed	1800 rpm
Stack Parameters	
Stack Height	20 ft
Stack Diameter	0.67 ft
Exhaust Gas Flow	5,300 lb/hr
Exhaust Gas Flow	2,911 acfm
Exhaust Temperature	842 °F
Exhaust Gas Velocity	138.85 ft/sec

NOTE:

actual cubic feel per minute. acfm =

brake horsepower. bhp

Btu/hr °F = British thermal units per hour.

degrees Fahrenheit.

ft = feet

= ft/sec feet per second. pound per hour Lb/hr

revolutions per minute. rpm

<sup>&</sup>lt;sup>a</sup> Based on heating value for natural gas of 1040 British thermal units per standard cubic foot (Btu/scf).

Table 2-8 Emissions from FGT's Proposed Generator Engine

Poliutant	Emission Factor	Reference	lb/hr	TPY
Nitrogen Oxides	2.1 g/hp-hr	Manufacturer Data	2.71	0.68
Carbon Monoxide	1.4 g/hp-hr	Manufacturer Data	1.81	0.45
Volatile Organic Compounds (non methane)	0.24 g/hp-hr	Manufacturer Data	0.31	0.08
Particulate Matter	0.00999 lb/ <b>MM</b> Btu	AP-42, Table 3.2-2	0.04	0.01
Sulfur Dioxide	10 grains/100 scf	FERC Limit	0.11	0.03

<sup>\*</sup> based on 500 hours of operation per year

## 2.2.4 Fugitive Emissions

Potential new emissions from Compressor Station No. 17 also include fugitive emissions from the new valves and flanges that will be in gas service. These fugitive emissions have been estimated using USEPA factors for components in gas service at oil and gas facilities (EPA publication EPA-453/R-95-017, November 1995, "Protocol for Equipment Leak Emission Estimates"). Table 2-9 lists the quantities of existing and new components to be added as part of the Phase V Expansion Project and an estimate of the fugitive emissions from these sources.

**Table 2-9 VOC Fugitive Emission Calculations and Summary** 

Component	Service	Component	Emissions *	NM/NE	Emissions
A de		Count	Factor (ton/yr)	Fraction	(ton/yr)
Valves	Gas	246	0.0434606	0.05	0.53
Connector	Gas	0	0.0019316	0.05	0.00
Flanges	Gas	186	0.0037666	0.05	0.04
Open-Ended Line	Gas	63	0.0193158	0.05	0.06
Pumps/compressors	Gas	1	0.023179	0.05	0.00
Other	Gas	0	0.0849895	0.05	0.00
Valves	Light Oil	16	0.0241448	1.00	0.39
Connector	Light Oil	0	0.0020282	1.00	0.00
Flanges	Light Oil	37	0.0010624	1.00	0.04
Open-Ended Line	Light Oil	1	0.0135211	1.00	0.01
Pumps	Light Oil	1	0.1255527	1.00	0.13
Other	Light Oil	0	0.0724343	1.00	0.00
Valves	Heavy Oil	6	0.0000811	1.00	0.00
Connector	Heavy Oil	0	0.0000724	1.00	0.00
Flanges	Heavy Oil	14	0.0000038	1.00	0.00
Open-Ended Line	Heavy Oil	2	0.0013521	1.00	0.00
Other	Heavy Oil	0	0.0002994	1.00	0.00
				TOTAL:	1.20

<sup>\*</sup> EPA publication EPA-453/R-95-017, November 1995, "Protocol for Equipment Leak Emission Estimates

## 2.2.5 Emissions Summary

The total changes in emissions resulting from the project are listed on Table 2-10. As can be seen from the table, the emission increases are not significant under PSD. The calculations used to estimate these emissions are presented in Attachment D.

Table 2-10 Potential Annual Emissions (tpy) Summary

SOURCE ID	DESCRIPTION	NO <sub>x</sub>	CO	VOCª	SO <sub>2</sub>	PM
	EXISTING FA	ACILITY				···
1701	2000 bhp Recip. Engine	231.7	19.4	4.9	1.8	0.6
1702	2000 bhp Recip. Engine	231.7	19.4	4.9	1.8	0.6
1703	2000 bhp Recip. Engine	231.7	19.4	4.9	1.8	0.6
1704	2000 bhp Recip. Engine	222.1	19.1	4.6	1.8	0.6
1705	2400 bhp Recip. Engine	46.3	64.9	39.4	2.2	0.4
1706 (GEN01)	395 bhp Recip. Engine	3.8	0.4	0.2	0.0	0.0
1707 (GEN02)	395 bhp Recip. Engine	3.8	0.4	0.2	0.0	0.0
	OTHER SOURCES: b	0.0	0.0	3.3	0.0	0.0
EXIS	TING ANNUAL POTENTIALTOTALS:	971.1	143	62.4	9.4	2.8

	PROPOSED MODIF	IED FACIL	ITY			
1701	2000 bhp Recip. Engine	231.7	19.4	4.9	1.8	0.6
1702	2000 bhp Recip. Engine	231.7	19.4	4.9	1.8	0.6
1703	2000 bhp Recip. Engine	231.7	19.4	4.9	1.8	0.6
1704	2000 bhp Recip. Engine – Modified <sup>c</sup>	154.5	38.6	1.9	2.0	0.7
1705	2400 bhp Recip. Engine	46.3	64.9	39.4	2.2	0.4
1706	15,700 bhp Turbine engine – new	61.8	68.1	4.3	16.2	3.9
GEN03	585 bhp Recip. Engine – new	0.7	0.5	0.1	0.0	0.0
	OTHER SOURCES: b	0.0	0.0	4.5	0.0	0.0
PROPOSED ANNUAL POTENTIAL TOTALS:		958.4	230.3	64.9	25.8	6.8

NET CHANGES IN POTENTIAL EMISSIONS:	-12.7	87.3	2.5	16.4	4	

<sup>(</sup>a) VOC = Non-methane/non-ethane HC

<sup>(</sup>b) Other Sources Includes ancillary equipment, storage tanks and equipment leaks, estimated.

<sup>(</sup>c) Based on test data for a similar unit

#### 3.0 REGULATORY ANALYSIS

This section presents a review of federal and Florida State air quality regulations, which govern the operations and proposed modifications to be conducted at Compressor Station No. 17.

## 3.1 Federal Regulations Review

The federal regulatory programs administered by the USEPA have been developed under the authority of the Clean Air Act. The following subsections review the essential elements of the federal regulatory program and the impact they have on the operations and proposed modifications at Compressor Station No. 17.

## 3.1.1 Classification of Ambient Air Quality

The 1970 Amendments to the CAA gave the USEPA specific authority to establish the minimum level of air quality that all states would be required to achieve. These minimum values or standards were developed in order to protect the public health (primary) and welfare (secondary). The federally promulgated standards and additional state standards are presented on Table 3-1.

Areas of the country that have air quality equal to or better than these standards (i.e., ambient concentrations less than a standard) are designated as "Attainment Areas", while those where monitoring indicates air quality is worse than the standards are known as "Non-attainment Areas". The designation of an area has particular importance for a proposed project as it determines the type of permit review to which the application will be subject.

Major new sources or major modifications to existing major sources located in attainment areas are required to obtain a PSD permit before initiation of construction. Similar sources located in areas designated as non-attainment or that adversely impact such areas undergo more stringent Non-attainment New Source Review (NNSR). In either case, it is necessary, as a first step, to determine the air quality classification of a project site.

All areas of all states are classified as either attainment, non-attainment or unclassifiable for each criteria pollutant. Marion County in designated as unclassifiable or attainment for all criteria pollutants. These designations were obtained from 40 CFR 81.310, as updated in the June 5, 1998 Federal Register (FR31036) and 62-204.340 F.A.C.

Table 3-1 National and State Ambient Air Quality Standards (μg/m³)

POLLUTANT	AVERAGING PERIOD	EPA STANDARDS PRIMARY SECONDARY		FLORIDA STANDARDS	
PM <sub>10</sub>	24-hour <sup>1</sup>	150 150		150	
	annual <sup>2</sup>	50	50	50	
SO <sub>2</sub>	3-hour <sup>1</sup>		1,300	1,300	
	24-hour <sup>1</sup>	365		260	
	Annual <sup>2</sup>	80		60	
CO	1-hour <sup>1</sup>		40,000	40,000	
	8-hour <sup>1</sup>	10,000		10,000	
NO <sub>2</sub>	Annual <sup>2</sup>	100	100	100	
O <sub>3</sub>	1-hour <sup>3</sup>	235	235	235	

- 1) Not to be exceeded more than once per year.
- 2) Never to be exceeded.
- 3) Not to be exceeded on more than 3 days over 3 years.

Sources: 40 CFR 50; 36FR22384; Chap. 17-2.300.

The designation of Unclassifiable indicates that there is insufficient monitoring data to prove that the area has attained the federal standards; however, the limited data available indicate that the standard has been achieved. Areas with this classification are treated as attainment areas for permitting purposes. Since Marion County is considered in attainment for all pollutants, the proposed new emissions are potentially subject to PSD review and not non-attainment review.

#### 3.1.2 PSD Applicability

The 1977 CAA Amendments added Part C: Prevention of Significant Deterioration to the Act. This part required proposed new major stationary sources or existing sources planning a major modification in an area that has attained the National AAQS, to conduct a preconstruction review that includes a detailed analysis of the impacts from the source's emissions.

Federal air quality permitting regulations for attainment areas are codified in the Code of Federal Regulations (CFR), Title 40- Protection of the Environment, Part 52.21 - Prevention of Significant Deterioration (40 CFR 52.21).

For the PSD regulations to apply to a given project, the project's potential to emit must constitute a major stationary source or major modification to an existing major stationary source.

A major stationary source is defined as either any of the 28 sources identified in 40 CFR 52.21 that has a potential to emit 100 tons or more per year of any regulated pollutant, or any other stationary source that has the potential to emit 250 tons or more per year of a regulated pollutant. "Potential to emit" is determined on an annual basis after the application of air pollution control equipment, or any other federally enforceable restriction.

According to the "Draft New Source Review Workshop (NSR) Manual (USEPA, October 1990)," for a modification to be classified as major and therefore, subject to PSD review:

- (1) The modification must occur at an existing major stationary source, and
- (2) The net emissions increase of any pollutant emitted by the source, as a result of modification, is "significant", or
- (3) The modification results in emissions increases, which if considered alone would constitute a major stationary source.

"Significant" emission rates are defined as amounts equal to or greater than the emission rates given in Table 3-2.

Table 3-2 Applicability of PSD Significant Emission Rates

Pollutant	Emission Rate Tons/Year
Carbon Monoxide	100
Nitrogen Oxides	40
Sulfur Dioxide	40
Particulate Matter (PM/PM <sub>10</sub> )	25/15
Ozone (VOC)	40
Lead	0.6
Fluorides	3
Reduced Sulfur including Hydrogen Sulfide	10
Total Reduced Sulfur including Hydrogen Sulfide	10
Sulfuric Acid Mist	7
Lead	0.6
Mercury	0.1

Proposed project increases are determined for each pollutant and are equal to the actual emissions (average of the actual emissions over the two years immediately prior to the proposed project) subtracted from the proposed new allowable emissions. Fugitive emissions are only included in the potential to emit if the source is one of the 28 named source categories in 40 CFR 52.21(b)(1) or belongs to a stationary source category that is subject to an NSPS proposed prior to August 7, 1980 or that is subject to an NESHAPS promulgated prior to August 7, 1980. For this project, proposed new NO<sub>X</sub> emissions are significant.

Netting is required for each regulated pollutant for which the proposed project increases (decreases are not considered yet) result in a significant increase in emissions. Netting is performed by identifying both the creditable and contemporaneous increases and the reductions in emissions. The contemporaneous period is defined as the period of time from five years prior to estimated start of construction through estimated start of operation.

- a. 9 / 01/ 01 Date of estimated start of construction.
- b. 9/01/96 Five years prior to estimated start of construction date.
- c. 12 / 01/ 01 Date of estimated start of operation.
- d. 9 / 01/96 to 12 / 01 / 01 Contemporaneous period (b. to c.).

The requirements for creditable increases and reductions are listed below.

- The increases/reductions occurred within the contemporaneous period.
- For each unit at the source at which the change occurred, the increases/reductions were
  calculated as the allowable emissions after the change minus the actual emissions
  averaged over the two-year period immediately preceding the change.
- The increases/reductions occurred at the applicant's contiguous or adjacent plant site and came from units under the same common ownership or control.
- The reductions have not been relied upon in issuing a previous PSD permit (including use in netting for a PSD permit).
- The reductions have not been relied upon in issuing a non-attainment permit and the reductions have not been used as an offset1 in a non-attainment permit or reserved in

an application for use as an offset.

- The reductions will be federally enforceable by the start of construction of the proposed project and actually accomplished by the start of operation.
- The reductions have the same qualitative significance for public health as the increase from the proposed project.

Actual emission changes are provided in Table 3.3 and a summary of contemporaneous emission increases and decreases for Compressor Station No. 17 are listed in Table 3.4.

Table 3-3 Actual Annual NO<sub>X</sub> Emissions

Emission Unit	Total Hours of Operation 1/1/99 Through 12/31/00	A. Average Annual Hours of Operation	<i>B.</i> NOx Emission Rate (lbs/hr)	A x B /2000 NOx Actual Annual Emission Rate (tpy)
1704	14,163.7	7081.8	50.71	179.6
1706	0.0	0.0	0.0	0.0
GEN03	0.0	0.0	0.0	0.0

**Table 3-4 Contemporaneous Emission Changes** 

Project Date	Emission Unit At Which Change Occurred	Project Name Or Activity	A. Allowable Emissions After The Activity (Tons/Year)	B. Actual Emissions Prior To The Activity (Tons/Year)	Difference (A-B) (Tons/Year)	Creditable Decrease Or Increase
		-	NOx			
12/01/01	1704	Engine modified	154.5	179.6	-25,1	-25.1
12/01/01	1706	New turbine	61.8	0.0	61.8	61.8
12/01/01	GEN03	New Generator	0.7	0.0	0.7	0.7
			·	· · · · · · · · · · · · · · · · · · ·		37.4

<sup>\*</sup> Phase V portion only

Since Compressor Station No. 17 is not one of the 28 named source categories, but does emit >250 TPY of at least one regulated pollutant, it is considered a major source. However, the net increase in emissions resulting from the proposed actions will not exceed the PSD significant rates; therefore, the compressor station is not subject to PSD pre-construction review as shown in Table 3.5.

**Table 3-5 PSD Applicability** 

Regulated Pollutant:	NOx
Significance level as defined in 40 CFR 52.21(b)(23)	40
Net contemporaneous change from Table3-4 (tpy)	37.4
Is PSD review applicable?	No

## 3.1.3 Non-Attainment New Source Review (NSR) Applicability

Based on the current non-attainment provisions, all new major stationary sources, or major modifications to such sources, located in a non-attainment area must undergo non-attainment New Source Review, if they have the potential to emit above an NSR significant threshold. For major new sources or major modifications in an attainment or unclassifiable area, the non-attainment provisions apply if the source or modification is located within the area of influence of a non-attainment area. The area of influence is defined as an area, which is outside the boundary of a non-attainment area, but within the locus of all points that are 50 kilometers outside the non-attainment area.

Compressor Station No. 17 is located in an area that is designated as either attainment or not classifiable for all criteria pollutants and is not located in an area of influence outside a non-attainment area. Therefore, this compressor station is not subject to federal non-attainment New Source Review.

## 3.1.4 Applicability of New Source Performance Standards (NSPS)

Standards of Performance for New Sources are published in 40 CFR 60. All Standards apply to all new sources within a given category, regardless of geographic location or ambient air quality at the location.

The new turbine to be installed at Compressor Station No. 17 is subject to Subpart GG, Standards of Performance for Stationary Gas Turbines, because it will have a maximum heat input at peak load of >10.7 gigajoules/hour (10 MMBtu/hr) based on the lower heating value of the natural gas fuel. This regulation establishes emission limits for NO<sub>X</sub> and SO<sub>2</sub> and requires performance testing and daily monitoring of fuel nitrogen and sulfur. The applicable emission standards are provided in Table 3-6.

The NO<sub>x</sub> emission limit for Subpart GG is calculated as follows:

$$STD = 0.0150 (14.4/Y) + F$$
  
 $STD = Allowable NO_x emissions$ 

Y = Heat rate at peak load not to exceed 14.4 KjJwatt-hour

F = NO<sub>x</sub> emission allowance

The fuel bound nitrogen in natural gas is less than 0.015% by weight. Therefore, the value of F as defined in 40 CFR 60.332(3) is equal to zero.

$$Y = Btu/bhp-hr \times 1.055 Kj/Btu \times hp-hr/745.7 watt-hour$$
  
= 7,804 Btu/bhp-hr \times 1.055 Kj/Btu \times hp-hr/745.7 watt-hour  
= 11.0 Kj/watt-hr

$$STD = 0.0150 (14.4/11.0) + 0$$

= 0.0196 %

 $= 196 ppm_{v}$ 

Table 3-5 summarizes the NSPS applicability for the proposed gas engines.

The turbine at this facility will meet the NSPS for  $NO_X$  of 196 ppmv (i.e., manufacturer's estimation of 25 ppmv), and for  $SO_2$  of 150 ppmv (estimated for this turbine to be 4 ppmv).

Table 3-6 Applicability of New Source Performance Standards

NSPS Subpart	NSPS Regulations	Equipment	Fuel	Pollutant	Heat Input Applicability	Equipment Design Maximum*	NSPS Emission Limits	Equipment Emissions
GG	60.332(a)(2)	Engine No. 1708 Gas Turbine	Gas	NO <sub>2</sub>	>10 MM Btu/hr	56.45 MMBtu/hr	196 ppm <sub>v</sub>	25 ppm <sub>v</sub>
GG	60.333(a)	Engine No. 1708 Gas Turbine	Gas	SO <sub>2</sub>	>10 MM Btu/hr	56.45 MMBtu/hr	150 ppm <sub>v</sub>	4 ppm <sub>v</sub>

Design maximum based on vendor data.

## 3.1.2.6 Good Engineering Practice (GEP) Stack Height Analysis

The 1977 CAA Amendments require that the emission limitation required for control of any pollutant not be affected by a stack that exceeds GEP height. Further, no dispersion credit is given during air quality modeling for stacks that exceed GEP. GEP stack height is defined as the highest of:

- 65 meters: or
- · a height established by applying the formula

HGEP = H + 1.5 L

Where:

HGEP = GEP Stack Height,

H = Height of the structure or nearby structure, and

L = Lesser dimension (height or projected width) of the nearby structure; or

a height demonstrated by fluid modeling or field study.

A structure or terrain feature is considered nearby if a stack is within a distance of five times the structure's height or maximum projected width. Only the smaller value of the height or projected width is used and the distance to the structure cannot be greater than 0.8 kilometers. Although GEP stack height regulations require that the stack height used in modeling for determining compliance with National AAQS and PSD increments not exceed GEP stack height, the actual stack height may be greater.

The stack height regulations also increase GEP stack height beyond that resulting from the formula in cases where plume impaction occurs. Plume impaction is defined as concentrations measured or modeled to occur when the plume interacts with elevated terrain. Elevated terrain is defined as terrain that exceeds the height calculated by the GEP stack height formula. Because terrain in the vicinity of the project site is generally flat, plume impaction was not considered in determining the GEP stack height.

The proposed stack at Compressor Station No. 17 will be 61.5 feet (18.74 meters) tall. Based on the proposed building dimensions, the calculated GEP stack height is less than 65 meters; therefore, GEP stack height is 65 meters. Since the stack is less than GEP stack height, it complies with the regulatory requirement.

## 3.2 Florida State Air Quality Regulations

Compressor Station No. 17 is currently operating under Permit No. 0830070-001-AV and is subject to the provisions of that permit. Rule 62, F.A.C., contains the air quality rules and regulations for the State of Florida. The primary federal regulations that affect Compressor Station No. 17 have been incorporated into or are referenced by these rules. The significant state regulations that are applicable to the new emission units are briefly listed below.

3.2.1 Rule 62-210.300 Permits Required

FGT is required to obtain a construction permit prior to construction of new emission units. This requirement is being met by the submittal of this application.

3.2.2 Rule 62-204.240 Ambient Air Quality Standards

FGT must not violate any of the ambient air quality standards listed under this rule.

3.2.3 Rule 62-296.320(2) Objectionable Odors

This rule prohibits the discharge of pollutants that will cause or contribute to an objectionable odor.

3.2.4 Rule 62-296.320(4)(b)1 General Particulate Emission Limiting Standards.

FGT is prohibited from allowing the new compressor engine to discharge into the atmosphere the emissions of air pollutants, the density of which is equal to or greater than that designated as Number 1 on the Ringelmann Chart (20 percent opacity).

3.2.5 Rule 62-210.300(3)(a) Exempt Emissions Units and/or Activities.

The emissions from the emergency generator and the fugitive leak emissions are insignificant sources and are exempt from the permitting requirements of Chapter 62-210 Stationary Sources - General Requirements, 62-213 Operation Permits For Major Sources Of Air Pollution and 62-4 Permits.

## **4.0 REFERENCES**

Gas Research institute, 1999. GRI-HAPCalc Software Version 3.0, Radian International, LLC.

- U.S. Environmental Protection Agency (USEPA). 1980. PSD Workshop Manual. Research Triangle Park, NC.
- U.S. Environmental Protection Agency (USEPA). 1995. Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources (5<sup>th</sup> Ed.) AP-42. Research Triangle Park, NC.

Attachment A

**DEP Forms** 



# **Department of Environmental Protection**

# **Division of Air Resources Management**

### **APPLICATION FOR AIR PERMIT - TITLE V SOURCE**

See Instructions for Form No. 62-210.900(1)

#### I. APPLICATION INFORMATION

Identification of Facility					
1. Facility Owner/Company Name: Florid	. Facility Owner/Company Name: Florida Gas Transmission Company				
2. Site Name: Compressor Station No.	. 17				
3. Facility Identification Number: 08	830070 [ ] Unknown				
4. Facility Location: Street Address or Other Locator: P.O.	Box 337				
City: Silver Springs Coun	ty: Marion Zip Code: 34489-0337				
5. Relocatable Facility?	6. Existing Permitted Facility?				
[ ] Yes [X] No	[X] Yes [ ] No				
Application Contact					
1. Name and Title of Application Contact:	:				
Jim Thompson,					
Environmental Project Manager					
2. Application Contact Mailing Address:					
Organization/Firm: Florida Gas Tran	- I				
Street Address: 111 Kelsey Lane					
City: Tampa	State: FL Zip Code: 33619				
3. Application Contact Telephone Number	rs:				
Telephone: (800) 381-1477	Fax: (813) 655-3951				
Application Processing Information (DEP Use)					
1. Date of Receipt of Application:	5/2/01				
2. Permit Number:	0830010-003-AC				
3. PSD Number (if applicable):					
4. Siting Number (if applicable):					

DEP Form No. 62-210.900(1) - Form

Effective: 2/11/99 A - 2

#### Purpose of Application

#### Air Operation Permit Application

This Application for Air Permit is submitted to obtain: (Check one) 1 Initial Title V air operation permit for an existing facility which is classified as a Title V source. Initial Title V air operation permit for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source. Current construction permit number: Title V air operation permit revision to address one or more newly constructed or modified emissions units addressed in this application. Current construction permit number: Operation permit number to be revised: [X] Title V air operation permit revision or administrative correction to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. (Also check Air Construction Permit Application below.) Operation permit number to be revised/corrected: 0830070-001-AV ] Title V air operation permit revision for reasons other than construction or modification of an emissions unit. Give reason for the revision; e.g., to comply with a new applicable requirement or to request approval of an "Early Reductions" proposal. Operation permit number to be revised: Reason for revision: Air Construction Permit Application This Application for Air Permit is submitted to obtain: (Check one) [X] Air construction permit to construct or modify one or more emissions units. [ ] Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

Air construction permit for one or more existing, but unpermitted, emissions units.

wner/Authorized Representative or R	esponsible Officia	<u>al</u>
Name and Title of Owner/Authorized	Representative or	Responsible Official:
Danny Pribble, Vice President, Operati	ions	
		al Mailing Address:
Street Address: P.O. Box 1188		
City: Houston	State: TX	Zip Code: 77251
Owner/Authorized Representative or F	Responsible Officia	al Telephone Numbers:
Telephone: (713) 345-7162	· · · · · · · · · · · · · · · · · · ·	ax: (713) 646-3201
Owner/Authorized Representative or F	Responsible Officia	al Statement:
the responsible official (check here [ ) application, whichever is applicable, formed after reasonable inquiry, that accurate and complete and that, to the reported in this application are based emissions. The air pollutant emissions in this application will be operated an standards for control of air pollutant end rules of the Department of Envirounderstand that a permit, if granted by authorization from the Department, an	X ], if so) of the Ti I hereby certify, b the statements mad be best of my knowl upon reasonable is units and air pol d maintained so a emissions found in enmental Protectio y the Department, and I will promptly ons unit.	tle V source addressed in this ased on information and belief de in this application are true, edge, any estimates of emissions techniques for calculating flution control equipment described is to comply with all applicable in the statutes of the State of Florida and revisions thereof. I cannot be transferred without
	Name and Title of Owner/Authorized Danny Pribble, Vice President, Operation Owner/Authorized Representative or Forganization/Firm: Florida Gas Trans Street Address: P.O. Box 1188 City: Houston Owner/Authorized Representative or Forganization Owner/Authorized Representative or Forganization I, the undersigned, am the owner or an the responsible official (check here [2]) application, whichever is applicable, formed after reasonable inquiry, that accurate and complete and that, to the reported in this application are based emissions. The air pollutant emission in this application will be operated an standards for control of air pollutant and rules of the Department of Envirounderstand that a permit, if granted by authorization from the Department, and legal transfer of any permitted emission.	Organization/Firm: Florida Gas Transmission Company Street Address: P.O. Box 1188  City: Houston State: TX  Owner/Authorized Representative or Responsible Official Telephone: (713) 345-7162 - Fat Owner/Authorized Representative or Responsible Official I, the undersigned, am the owner or authorized representative responsible official (check here [X], if so) of the Ti application, whichever is applicable. I hereby certify, be formed after reasonable inquiry, that the statements made accurate and complete and that, to the best of my knowledge reported in this application are based upon reasonable to emissions. The air pollutant emissions units and air polling in this application will be operated and maintained so a standards for control of air pollutant emissions found in and rules of the Department of Environmental Protection understand that a permit, if granted by the Department, authorization from the Department, and I will promptly legal transfer of any permitted emissions unit.

### **Professional Engineer Certification**

1.	Professional Enginee	r Name:	Kevin	McGlynn			
	Registration Number	: 50908					
2.	Professional Enginee Organization/Firm:	r Mailing Addres McGlynn (		Company			
	Street Address:	1967 Com	monwealth	Lane			
	City:	Tallahassee	State:	FL	Zip Code:	32303	
3.	Professional Enginee	r Telephone Nur	nbers:			·	
1	Telephone: (850)38	30-5035		Fax: (85	50) 350-5002		

<sup>\*</sup> Attach letter of authorization if not currently on file.

### 4. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein\*, that:

- (1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and
- (2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain a Title V source air operation permit (check here [ ], if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [X], if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ], if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Date P.E. 4/27/01

\* Attach any exception to certification statement.

### **Scope of Application**

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
004			\$0
008	Turbine Compressor Engine No. 1706 15,700 bhp,Natural Gas Fired	NA	\$0
009	Reciprocating I. C. Generator Engine No. 3, 585 bhp, Natural Gas Fired	NA	\$0
<u> </u>			

Application P	rocessing Fee	
Check one: [	] Attached - Amount: \$	[X] Not Applicable_

#### Construction/Modification Information

1. Description of Proposed Project or Alterations:

Florida Gas Transmission Company (FGT) is proposing to install a new Pignone PGT-10B 15,700 bhp compressor turbine and to modify an existing reciprocating engine at the above referenced facility. A new 440 kW (585 bhp) generator set will also be installed to replace two

existing generators.

- 2. Projected or Actual Date of Commencement of Construction: 09/01/01
- 3. Projected Date of Completion of Construction: 12/01/01

#### **Application Comment**

This proposed modification is part of FGT's Phase V Expansion project, aimed at increasing the supply capacity of FGT's network servicing domestic, commercial, and industrial customers in Florida.

The existing facility is currently operating under Permit No. 0830070-001-AV.

#### II. FACILITY INFORMATION

### A. GENERAL FACILITY INFORMATION

# **Facility Location and Type**

1.	Facility UTM Coord	dinates:			
	Zone: 17	East (km)	: 418.84	North	h (km): 3240.90
2.	Facility Latitude/Lo Latitude (DD/MM/	=	Longitude (	(DD/MM	//SS): 81/50/08
3.	Governmental Facility Code: 0	4. Facility Status Code: A	5. Facility Ma Group SIC 49	-	6. Facility SIC(s): 4922
	•	limit to 500 characters):  o. 17 is an existing natural or engines.	il gas pipeline co	mpressor	station with five

### **Facility Contact**

1.	Name and Title of Facility Contact:	David Read, Team	Environmentalist
2.	Facility Contact Mailing Address: Organization/Firm: Florida Gas Tran	nsmission Company	
	Street Address: P.O. Box 337 City: Silver Springs	State: FL	Zip Code: 34489-0337
3.	Application Contact Telephone Num	bers:	
	Telephone: (850) 350-5500	F	ax: (850) 350-5501

# **Facility Regulatory Classifications**

### Check all that apply:

1. [ ] Small Business Stationary Source? [	] Unknown
2. [X] Major Source of Pollutants Other than Hazardous Air P	ollutants (HAPs)?
3. [ ] Synthetic Minor Source of Pollutants Other than HAPs?	?
4. [X] Major Source of Hazardous Air Pollutants (HAPs)?	
5. [ ] Synthetic Minor Source of HAPs?	
6. [ ] One or More Emissions Units Subject to NSPS?	
7. [ ] One or More Emission Units Subject to NESHAP?	
8. [ ] Title V Source by EPA Designation?	
9. Facility Regulatory Classifications Comment (limit to 200 cha	racters):
HAPs major source definition based on calculations performed us Institute's GRI-HAPCalc 3.0 software.	ing the Gas Research

### **List of Applicable Regulations**

FDEP Title V Core List	
62-296-320(4)(b)1 General Visible Emissions Standards	
40 CFR 60, Subpart GG Standards of Performance for Stationary Gas-fired Turbines	

### **B. FACILITY POLLUTANTS**

### List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif.	3. Requested Emissions Cap		4. Basis for Emissions	5. Pollutant Comment
Emitted	Cidosii.	lb/hour	tons/year	Cap	
NO <sub>x</sub>	A				
со	A				
VOC	В				
SO <sub>2</sub>	В				
PM	В				
HAPs	A				
			<del></del>		
				,	

# C. FACILITY SUPPLEMENTAL INFORMATION

# **Supplemental Requirements**

1. Area Map Showing Facility Location:
[X]Attached, Document ID: Narrative Fig. 1-1 [ ] Not Applicable [ ] Waiver Requested
2. Facility Plot Plan:
[X] Attached, Document ID: Att. B_ [ ] Not Applicable [X] Waiver Requested
3. Process Flow Diagram(s):
[ ] Attached, Document ID:[ ] Not Applicable [X] Waiver Requested
4. Precautions to Prevent Emissions of Unconfined Particulate Matter:
[ ] Attached, Document ID: [X] Not Applicable [ ] Waiver Requested
5. Fugitive Emissions Identification:
[ ] Attached, Document ID:[X] Not Applicable [ ] Waiver Requested
6. Supplemental Information for Construction Permit Application:
[ ] Attached, Document ID:[X] Not Applicable
7. Supplemental Requirements Comment:
Attachment B contains a plot plan.
Attachment C has vendor supplied information.
Attachment D has supporting calculations.
Attachment E consists of a test report for Engines 1704 and a summary report for modified similar engine 1205.

# Additional Supplemental Requirements for Title V Air Operation Permit Applications

8. List of Proposed Insignificant Activities:  [ ] Attached, Document ID: [X] Not Applicable
9. List of Equipment/Activities Regulated under Title VI:
[ ] Attached, Document ID:
[ ] Equipment/Activities On site but Not Required to be Individually Listed
[X] Not Applicable
10. Alternative Methods of Operation:
[ ] Attached, Document ID: [X] Not Applicable
11. Alternative Modes of Operation (Emissions Trading):
[ ] Attached, Document ID: [X] Not Applicable
12. Identification of Additional Applicable Requirements:
[ ] Attached, Document ID: [X] Not Applicable
13. Risk Management Plan Verification:
[ ] Plan previously submitted to Chemical Emergency Preparedness and Prevention
Office (CEPPO). Verification of submittal attached (Document ID:) or
previously submitted to DEP (Date and DEP Office:)
[ ] Plan to be submitted to CEPPO (Date required:)
[X] Not Applicable
14. Compliance Report and Plan:
[ ] Attached, Document ID: [X] Not Applicable
15. Compliance Certification (Hard-copy Required):
[ ] Attached, Document ID: [X] Not Applicable

Emissions Unit Information Section 1 of 4	Em	issions	Unit	Information	Section	1	of	4	
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#### III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

# A. GENERAL EMISSIONS UNIT INFORMATION (All Emissions Units)

### **Emissions Unit Description and Status**

1. Type of Emissions Unit Addressed in This Section: (Check one)					
[X] This Emissions Unit Information Section addresses, as a single emissions process or production unit, or activity, which produces one or more air powhich has at least one definable emission point (stack or vent).					
[ ] This Emissions Unit Information Section addresses, as a single emissions process or production units and activities which has at least one definable (stack or vent) but may also produce fugitive emissions.					
[ ] This Emissions Unit Information Section addresses, as a single emissions process or production units and activities which produce fugitive emission					
2. Regulated or Unregulated Emissions Unit? (Check one)	<del>-</del>				
[X] The emissions unit addressed in this Emissions Unit Information Section i emissions unit.	is a regulated				
[ ] The emissions unit addressed in this Emissions Unit Information Section i emissions unit.	is an unregulated				
3. Description of Emissions Unit Addressed in This Section (limit to 60 charac	cters):				
15,700 bhp natural gas fired turbine compressor unit.					
	[] No ID				
ID:	] ID Unknown				
5. Emissions Unit Status Code: A 6. Initial Startup Date: 12/01/01					
9. Emissions Unit Comment: (Limit to 500 Characters)					
The proposed turbine engine will be a Pignone PGT10B engine compressor unit ISO rated at 15,700 bhp. Fuel will be exclusively natural gas from the FGT's gas pipeline. The proposed engine will incorporate dry, low NO <sub>X</sub> combustion technology. This engine will be designated as Engine No. 1706.					

Emissions Unit Information Section1 of4
Emissions Unit Control Equipment
1. Control Equipment/Method Description (Limit to 200 characters per device or method):
The proposed engine will incorporate dry, low NOX combustion technology.
2. Control Device or Method Code(s): NA

### **Emissions Unit Details**

1. Package Unit:	
Manufacturer: Pignone	Model Number: PGT10B
2. Generator Nameplate Rating:	MW
3. Incinerator Information:	
Dwell Temperature:	°F
Dwell Time:	seconds
Incinerator Afterburner Temperature:	°F

PARISSIONS CHILLISTICH MALION DECLION 1 OF T	Emissions	Unit	Information	Section	1	of	4	
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# B. EMISSIONS UNIT CAPACITY INFORMATION (Regulated Emissions Units Only)

# **Emissions Unit Operating Capacity and Schedule**

1. Maximum Heat Input Rate:	134.77	mmBtu/hr
2. Maximum Incineration Rate:	NA lb/hr	tons/day
3. Maximum Process or Through	hput Rate: NA	
4. Maximum Production Rate:	NA	
5. Requested Maximum Operat	ing Schedule:	
	24 hours/day	7 days/week
	52 weeks/year	8760 hours/year
6. Operating Capacity/Schedule	Comment (limit to 200 charact	ters):
Heat input is 134.77 MM Btu/hr 10%.	based on vendor specifications	of 122.52 MM Btu/hr plus

Emissions	Unit	Information	Section	1	of	4	

# C. EMISSIONS UNIT REGULATIONS (Regulated Emissions Units Only)

# List of Applicable Regulations

FDEP Title V Core List	
62-296.320(4)(b)1 General Visible Emissions Standards	
40 CFR 60, Subpart GG Standards of	
Performance for Stationary Gas-fired	

<b>Emissions Unit Information Section</b>	1	of	4	
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# D. EMISSION POINT (STACK/VENT) INFORMATION (Regulated Emissions Units Only)

# **Emission Point Description and Type**

1.	Identification of Point on Ple Flow Diagram? 1706 New t	urbine	2. Emission Point Type Code: 1				
3.	100 characters per point):						
	NA						
4.	ID Numbers or Descriptions	s of Emission Un	its with this Emis	ssion Point in Commo	n:		
	None						
5. Discharge Type Code: V 6. Stack Height: 7. Exit Diameter: 7.6 feet					feet		
8.	Exit Temperature: 909 °F	9. Actual Vol. Rate: 215,		10. Water Vapor:			
11.	. Maximum Dry Standard Flo	w Rate: dscfm	12. Nonstack E	mission Point Height:	feet		
13.	Emission Point UTM Coord	linates:					
	Zone: 17	ast (km): 418.8	Nort	h (km): 3240.9			
14.	14. Emission Point Comment (limit to 200 characters):						
L							

Emissions	Unit	Information	Section	1	of	4

### E. SEGMENT (PROCESS/FUEL) INFORMATION (All Emissions Units)

Segment Description and Rate: Segment1_ of1_						
1. Segment Description (Prod	1. Segment Description (Process/Fuel Type) (limit to 500 characters):					
Natural gas fired reciprocating operating full time.	internal combust	ion engine driv	ving a natural gas compressor,			
Source Classification Code (SCC):     2-02-002-01     3. SCC Units:     million cubic feet burned						
4. Maximum Hourly Rate: 0.1296	5. Maximum A		6. Estimated Annual Activity Factor: NA			
7. Maximum % Sulfur: 0.03	8. Maximum 9		9. Million Btu per SCC Unit: 1040			
10. Segment Comment (limit t	o 200 characters)	):				
	Percent Sulfur is based on maximum Federal Energy Regulatory Commission (FERC) limit of 10 gr S/100scf and gas density of 0.0455 lb/scf.					
Segment Description (Process/Fuel Type ) (limit to 500 characters):						
2. Source Classification Code (SCC): CC Units:						
4. Maximum Hourly Rate:	5. Maximum A	Annual Rate:	6. Estimated Annual Activity Factor:			
7. Maximum % Sulfur:	7. Maximum % Sulfur: 8. Maximum % Ash: 9. Million Btu per SCC Unit:					
10. Segment Comment (limit t	o 200 characters	<b>)</b> :				

Emissions Unit Information Section	1	of 4	4
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# F. EMISSIONS UNIT POLLUTANTS (All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
	Device Code	Device Code	Regulatory Code
VOC			EL
SO <sub>2</sub>			EL
PM			EL
NO <sub>X</sub>			EL
со			EL
PM <sub>10</sub>			EL
HAPs			NS

<b>Emissions Unit Information Section</b>	1_	_ of _	4_	
Pollutant Detail Information Page	1	of _	_6	

# G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

### Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions		,,
1. Pollutant Emitted: NOX	2. Total Percent Efficience	cy of Control:
3. Potential Emissions: 14.10 lb/hour 61	.8 tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions:	to to	ns/year
6. Emission Factor: 14.1 lb/hr Reference: Vendor's data		7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 charac	eters):	5
(14.1 lb/hr)(1 ton/2000 lb)(8760hr/1 yr) = 61.76		
(14.1 10/11)(1 1011/2000 10)(0/0011/1 91)	tons/year	
9. Pollutant Potential/Fugitive Emissions Comm	nent (limit to 200 character	s):
Vendor's data based on ISO conditions and site	elevation.	
Allowable Emissions Allowable Emissions	1_of1_	
Basis for Allowable Emissions Code:     RULE	2. Future Effective Date Emissions: NA	e of Allowable
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable	Emissions:
25 ppmv	14.1 lb/hour	61.8 tons/year
5. Method of Compliance (limit to 60 character	s):	
Initial performance test.		
6. Allowable Emissions Comment (Desc. of Op	erating Method) (limit to 2	00 characters):
40 CFR 60.332(3) limits NOX emissions to 196	ppmv.	

<b>Emissions Unit Information Section</b>	1_	_ of _	4_	
Pollutant Detail Information Page	2	of	6	

# G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units Emissions-Limited and Preconstruction Review Pollutants Only)

Emissions-Limited and Treconst	idelion Review Fondtants Only)		
Potential/Fugitive Emissions			
1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control:		
3. Potential Emissions: 22.50 lb/hour 98.	4. Synthetically Limited? [ ]		
5. Range of Estimated Fugitive Emissions:	totons/year		
6. Emission Factor: 5.14 lb/hr @ 100% load; 2  Reference: Vendor's data	7. Emissions Method Code:		
8. Calculation of Emissions (limit to 600 charac	ters):		
(22.5  lb/hr)(1  ton/2000  lb)(8760  hr/yr) = 98.55  t	tons/yr		
100% load for 3504 hr/yr and 50% load for 5256 hr/yr. (5.14 lb/hr)(1 ton/2000 lb)(3504 hr/yr) = 9.01 tons/yr (22.5 lb/hr)(1 ton/2000 lb)(5256 hr/yr) = 59.13 tons/yr 9.01 tpy + 59.13 tpy = 68.14 tpy			
9. Pollutant Potential/Fugitive Emissions Comm Vendor's data based on ISO conditions and site	,		
Allowable Emissions Allowable Emissions	1_ of2		
1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: 5.14 lb/hour 9.01 tons/year		
5. Method of Compliance (limit to 60 character			
Compliance test and Recordkeeping of hours of	operation and load.		
6. Allowable Emissions Comment (Desc. of Op	erating Method) (limit to 200 characters):		
Hours at 100% load = to 3504 hr/yr or more (5.14 lb/hr)(1 ton/2000 lb)(3504 hr/yr) = 9.01 to	ons/yr		

Emissions Unit Information Section1	of4
Pollutant Detail Information Page2 o	of6
Allowable Emissions Allowable Emissions	2_of2_
1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: ESCPSD	4. Equivalent Allowable Emissions: 22.5 lb/hour 59.13 tons/year
5. Method of Compliance (limit to 60 character Compliance test and Recordkeeping of hours of	•
6. Allowable Emissions Comment (Desc. of Op Hours at 50% load = to 5256 hr/yr or less (22.5 lb/hr)(1 ton/2000 lb)(5256 hr/yr) = 59.13	

<b>Emissions Unit Information Section</b>	1_	_ of _	4	
Pollutant Detail Information Page	3_ (	of	6	

# G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

	nissions Units - truction Review Pollutants Only)
Potential/Fugitive Emissions	
1. Pollutant Emitted: VOC	2. Total Percent Efficiency of Control:
3. Potential Emissions:  1.46 lb/hour 6.3	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions:	to tons/year
6. Emission Factor: 0.29 lb/hr @ 100% load; 1 Reference: Vendor's data	1.46 lb/hr @ 50% load 7. Emissions Method Code: 5
8. Calculation of Emissions (limit to 600 charac	ters):
(1.46  lb/hr)(1  ton/2000  lb)(8760  hr/yr) = 6.39  to	ons/yr
100% load for 3504 hr/yr and 50% load for 5256 (0.29 lb/hr)(1 ton/2000 lb)(3504 hr/yr) = 0.51 to (1.46 lb/hr)(1 ton/2000 lb)(5256 hr/yr) = 3.84 to 0.51 tpy + 3.84 tpy = 4.34 tpy	ons/yr
9. Pollutant Potential/Fugitive Emissions Comm	nent (limit to 200 characters):
Vendor's data based on ISO conditions at variou assumed to be 10% of THC	as loads for total hydrocarbons (THC). VOCs
Allowable Emissions1	of2_
Basis for Allowable Emissions Code:     ESCPSD	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions:
	0.29 lb/hour 0.51 tons/year
5. Method of Compliance (limit to 60 character	s):
Compliance test and Recordkeeping of hours of	operation and load.
6. Allowable Emissions Comment (Desc. of Op	erating Method) (limit to 200 characters):
Hours at 100% load = to 3504 hr/yr or more (0.29 lb/hr)(1 ton/2000 lb)(3504 hr/yr) = 0.51 to	08s/yr

Emissions Unit Information Section1	of4
Pollutant Detail Information Page3_ of	6
Allowable Emissions Allowable Emissions 2	of2
Basis for Allowable Emissions Code:     ESCPSD	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions:
	1.46 lb/hour 3.84 tons/year
5. Method of Compliance (limit to 60 character	rs):
Compliance test and Recordkeeping of hours of	operation and load.
6. Allowable Emissions Comment (Desc. of Op	perating Method) (limit to 200 characters):
Hours at 50% load = to 5256 hr/yr or less	
(1.46  lb/hr)(1  ton/2000 lb)(5256  hr/yr) = 3.84  to	ons/yr

<b>Emissions Unit Information Section</b>	1_	of	4	
Pollutant Detail Information Page	4	of	6	

# G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units Emissions-Limited and Preconstruction Review Pollutants Only)

Emissions-Limited and Precons	truction Review Pollut	ants Only)	
Potential/Fugitive Emissions			
1. Pollutant Emitted: SO2	2. Total Percent Efficiency of Control:		
3. Potential Emissions: 3.70 lb/hour 16.	4. Synthetically tons/year Limited?		
5. Range of Estimated Fugitive Emissions:  [ ] 1 [ ] 2 [ ] 3	to	tons/year	
6. Emission Factor: 10 gr/100scf		7. Emissions	
Reference: Vendor's fuel use	and FERC limitation	Method Code:	
8. Calculation of Emissions (limit to 600 charac	eters):		
(10 gr S/100 scf)(0.1296 MMscf/hr)(1 lb/7000 g (1.85 lb S/hr)(2 lb SO2/lb S) = 3.70 lb SO2/hr (3.70 lb SO2/hr)(8760 hr/yr)(1 ton/2000 lb) = 16	,		
9. Pollutant Potential/Fugitive Emissions Comn	nent (limit to 200 charac	ters):	
Based on vendor's fuel use data plus 10%. SO2 emission factor is based on maximum Feder limit of 10 gr S/100 scf and gas density of 0.045:	<del></del>	ommission (FERC)	
Allowable Emissions Allowable Emissions	1_of1_		
Basis for Allowable Emissions Code:     RULE	2. Future Effective D Emissions:	ate of Allowable	
3. Requested Allowable Emissions and Units:	4. Equivalent Allowa	ble Emissions:	
4 ppmv	3.70 lb/hour	16.2 tons/year	
5. Method of Compliance (limit to 60 character	s):		
Initial performance test and fuel monitoring.			
6. Allowable Emissions Comment (Desc. of Op	erating Method) (limit to	200 characters):	
40 CFR 60.332(3) limits SO2 emissions to 150 p	ppmv.		

<b>Emissions Unit Information Section</b>	1_	of _	4_	
Pollutant Detail Information Page	5	of	6	

# G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

### Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions	
1. Pollutant Emitted: PM/PM10	2. Total Percent Efficiency of Control:
3. Potential Emissions:	4. Synthetically
0.89 lb/hour 3.90	0 tons/year Limited? [ ]
5. Range of Estimated Fugitive Emissions:	to tons/year
6. Emission Factor: 0.0066 lb/MM Btu	7. Emissions
Reference: Table 3.1-2a, AP-4	Method Code: 4
8. Calculation of Emissions (limit to 600 charac	ters):
(0.0066 lb/MM Btu)(134.77 MM Btu/hr) = 0.89	lh/hr
(0.89  lb/hr)(8760  hr/yr)(1  ton/2000  lb) = 3.90  to.	
(0.05) 10,111)(0,100 111,151)(1 0011 2001 117)	3
	(" :
9. Pollutant Potential/Fugitive Emissions Comm	ent (limit to 200 characters):
Based on vendor's fuel use data plus 10%.	
Allowable Emissions Allowable Emissions	NA_ of
Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions:
	lb/hour tons/year
5. Method of Compliance (limit to 60 character	s):
6. Allowable Emissions Comment (Desc. of Op	erating Method) (limit to 200 characters):

Emissions Unit Information Section _	_1_	of _	4_	
Pollutant Detail Information Page	6	of	6	

# G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

### Emissions-Limited and Preconstruction Review Pollutants Only)

### Potential/Fugitive Emissions

I Otential rugitive Entissions					
1. Pollutant Emitted: HAPs	2. Total Percent Efficiency of Control:				
3. Potential Emissions:	4. Synthetically				
<b>!</b>	3.29 tons/year Limited? [ ]				
5. Range of Estimated Fugitive Emissions:					
	to tons/year				
6. Emission Factor: 0.0217 g/hp-hr	7. Emissions				
Reference: GRI-HAPCalc 3.0	Method Code: 5				
8. Calculation of Emissions (limit to 600 charac					
o. Calculation of Establish (see )					
(0.0217g/hp-hr)(15,700 hp)(1 lb/453.6 g) = 0.75  (0.751/lb/hr)(8760 hr/yr)(1 ton/2000 lb) = 3.29 t					
9. Pollutant Potential/Fugitive Emissions Comm	nent (limit to 200 characters):				
_					
Detailed calculations provided in Attachment D.					
Included in VOC emissions.					
Allowable Emissions Allowable Emissions	NA of				
1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:				
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions:				
	lb/hour tons/year				
5. Method of Compliance (limit to 60 character	rs):				
6. Allowable Emissions Comment (Desc. of Op	perating Method) (limit to 200 characters):				

Emissions	Unit	Information	Section	1 of	f 4

# H. VISIBLE EMISSIONS INFORMATION (Only Regulated Emissions Units Subject to a VE Limitation)

Vis	sible Emissions Limitation: Visible Emission	ons Limitation o	of
1.	Visible Emissions Subtype: VE20	2. Basis for Allowabl	e Opacity:
		[X] Rule	[ ] Other
3.	Requested Allowable Opacity:		0.7
		cceptional Conditions:	% min/hour
	Maximum Period of Excess Opacity Allowe	u:	mm/nour
4.	Method of Compliance:		
5.	Visible Emissions Comment (limit to 200 ch	aracters):	
	I CONTINUOUS MO	NITOD INFODMATI	ION
	I. CONTINUOUS MO Only Regulated Emissions Units		
Co	(Only Regulated Emissions Units	Subject to Continuou	s Monitoring)
	(Only Regulated Emissions Units ontinuous Monitoring System: Continuous	Subject to Continuou  MonitorNA_ of	s Monitoring)
<u>Co</u>	(Only Regulated Emissions Units	Subject to Continuou	s Monitoring)
	(Only Regulated Emissions Units ontinuous Monitoring System: Continuous	Subject to Continuou  MonitorNA_ of	s Monitoring)
1.	(Only Regulated Emissions Units ontinuous Monitoring System: Continuous Parameter Code:	Subject to Continuou  MonitorNA_ of  2. Pollutant(s):	s Monitoring)
3.	(Only Regulated Emissions Units ontinuous Monitoring System: Continuous Parameter Code:  CMS Requirement:  Monitor Information: Manufacturer:	Subject to Continuou  MonitorNA_ of  2. Pollutant(s):  [ ] Rule	S Monitoring)  [ ] Other
3. 4.	(Only Regulated Emissions Units ontinuous Monitoring System: Continuous Parameter Code:  CMS Requirement:  Monitor Information: Manufacturer: Model Number:	Subject to Continuou  MonitorNA_ of  2. Pollutant(s):  [ ] Rule  Serial Number	s Monitoring)  [ ] Other :
3.	(Only Regulated Emissions Units ontinuous Monitoring System: Continuous Parameter Code:  CMS Requirement:  Monitor Information: Manufacturer:	Subject to Continuou  MonitorNA_ of  2. Pollutant(s):  [ ] Rule	s Monitoring)  [ ] Other :
<ol> <li>3.</li> <li>4.</li> <li>5.</li> </ol>	(Only Regulated Emissions Units ontinuous Monitoring System: Continuous Parameter Code:  CMS Requirement:  Monitor Information:     Manufacturer:     Model Number: Installation Date:	Subject to Continuou  MonitorNA of  2. Pollutant(s):  [ ] Rule  Serial Number  6. Performance Spec	s Monitoring)  [ ] Other :
3. 4.	(Only Regulated Emissions Units ontinuous Monitoring System: Continuous Parameter Code:  CMS Requirement:  Monitor Information:     Manufacturer:     Model Number: Installation Date:	Subject to Continuou  MonitorNA of  2. Pollutant(s):  [ ] Rule  Serial Number  6. Performance Spec	s Monitoring)  [ ] Other :
<ol> <li>3.</li> <li>4.</li> <li>5.</li> </ol>	(Only Regulated Emissions Units ontinuous Monitoring System: Continuous Parameter Code:  CMS Requirement:  Monitor Information:     Manufacturer:     Model Number: Installation Date:	Subject to Continuou  MonitorNA of  2. Pollutant(s):  [ ] Rule  Serial Number  6. Performance Spec	s Monitoring)  [ ] Other :
<ol> <li>3.</li> <li>4.</li> <li>5.</li> </ol>	(Only Regulated Emissions Units ontinuous Monitoring System: Continuous Parameter Code:  CMS Requirement:  Monitor Information:     Manufacturer:     Model Number: Installation Date:	Subject to Continuou  MonitorNA of  2. Pollutant(s):  [ ] Rule  Serial Number  6. Performance Spec	s Monitoring)  [ ] Other :
<ol> <li>3.</li> <li>4.</li> <li>5.</li> </ol>	(Only Regulated Emissions Units ontinuous Monitoring System: Continuous Parameter Code:  CMS Requirement:  Monitor Information:     Manufacturer:     Model Number: Installation Date:	Subject to Continuou  MonitorNA of  2. Pollutant(s):  [ ] Rule  Serial Number  6. Performance Spec	s Monitoring)  [ ] Other :
<ol> <li>3.</li> <li>4.</li> <li>5.</li> </ol>	(Only Regulated Emissions Units ontinuous Monitoring System: Continuous Parameter Code:  CMS Requirement:  Monitor Information:     Manufacturer:     Model Number: Installation Date:	Subject to Continuou  MonitorNA of  2. Pollutant(s):  [ ] Rule  Serial Number  6. Performance Spec	s Monitoring)  [ ] Other :

Emissions Unit Information Section 1 of 4	Emi	issions	Unit	Information	Section	1	of	4
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# J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION (Regulated Emissions Units Only)

# **Supplemental Requirements**

1.	Process Flow Diagram
	[ ] Attached, Document ID: [ ] Not Applicable [X] Waiver Requested
2.	Fuel Analysis or Specification
	[ ] Attached, Document ID: [ ] Not Applicable [X] Waiver Requested
3.	Detailed Description of Control Equipment
	[ ] Attached, Document ID: [X] Not Applicable [ ] Waiver Requested
4.	Description of Stack Sampling Facilities
	[ ] Attached, Document ID: [ ] Not Applicable [X] Waiver Requested
5.	Compliance Test Report
	[ ] Attached, Document ID:
	[ ] Previously submitted, Date:
	[X] Not Applicable
6.	Procedures for Startup and Shutdown
	[ ] Attached, Document ID: [ ] Not Applicable [X] Waiver Requested
7.	Operation and Maintenance Plan
	[ ] Attached, Document ID: [X] Not Applicable [ ] Waiver Requested
8.	Supplemental Information for Construction Permit Application
	[X] Attached, Document ID:_Narrative & Attach. C_[ ] Not Applicable
9.	Other Information Required by Rule or Statute
	[ ] Attached, Document ID: [X] Not Applicable
10	. Supplemental Requirements Comment:
_	
1	pplemental information is provided in the narrative description and Attachment C
ac	companying these forms.

<b>Emissions Unit Information Section</b>	1	of	4	
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Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation
[ ] Attached, Document ID: [X] Not Applicable
12. Alternative Modes of Operation (Emissions Trading)
[ ] Attached, Document ID: [X] Not Applicable
13. Identification of Additional Applicable Requirements
[ ] Attached, Document ID: [X] Not Applicable
14. Compliance Assurance Monitoring Plan
[ ] Attached, Document ID: [X] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) NA
[ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
Attached, Document ID:
[ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:
[ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:
[ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:
[ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID:
[ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID:
[ ] Not Applicable

Emissions	Unit	Information	Section	2	of	4	
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#### III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

# A. GENERAL EMISSIONS UNIT INFORMATION (All Emissions Units)

#### **Emissions Unit Description and Status**

Diminotono e in e propriori una sociati						
1. Type of Emissions Unit Addressed in This Section: (Check one)						
[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).						
[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.						
[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.						
2. Regulated or Unregulated Emissions Unit? (Check one)						
[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.						
[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.						
3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):						
Reciprocating Engine 1704, 2000 bhp, natural gas fired						
4. Emissions Unit Identification Number: [ ] No ID ID: 004 [ ] ID Unknown						
5. Emissions Unit Startup Status Code: A Date: 1966 Tour SIC Code: A 7. Emissions Unit Major Group SIC Code: 49 8. Acid Rain Unit?						
9. Emissions Unit Comment: (Limit to 500 Characters)						
This is an existing 2000 bhp reciprocating compressor engine that is being modified. See Narrative Section 2.2.3 for description of modifications. The modification will result in a decrease in NOx emissions and an increase in fuel use.						

		imit to 200 charac	eters per device or method):
See Narrative Secti	on 2.2.2.		
2. Control Device	or Method Code(s):		
Emissions Unit De			
			Model Number: LS-8-SG

Dwell Temperature:

Incinerator Afterburner Temperature:

Dwell Time:

٥F

٥F

seconds

Emissions	Unit	Information	Section	2	of	4

# B. EMISSIONS UNIT CAPACITY INFORMATION (Regulated Emissions Units Only)

### **Emissions Unit Operating Capacity and Schedule**

1. Maximum Heat Input Rate	•	16.5	mmBtu/hr
2. Maximum Incineration Rate	e: NA	lb/hr	tons/day
3. Maximum Process or Thro	ughput Rate	: NA	
4. Maximum Production Rate	: NA		
5. Requested Maximum Oper	ating Sched	ule:	
	24 h	ours/day	7 days/week
	52 w	eeks/year	8760 hours/year
6. Operating Capacity/Schedu	le Commen	t (limit to 200 charact	ers):
Manufacturer rated at 2000 bh modification.		1 1	

<b>Emissions Unit Information Section</b>	2	of	4
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# C. EMISSIONS UNIT REGULATIONS2 (Regulated Emissions Units Only)

# List of Applicable Regulations

FDEP Title V Core List	
62-296.320(4)(b)1 General Visible Emissions Standards	
-	

Emissions	Unit	Information	<b>Section</b>	2	of	4
	~					$\overline{}$

# D. EMISSION POINT (STACK/VENT) INFORMATION (Regulated Emissions Units Only)

# **Emission Point Description and Type**

1.	Identification of Point on Pl Flow Diagram? 1704	ot Plan or	2. Emission Point Type Code: 1			
3.	Descriptions of Emission Po 100 characters per point):	oints Comprising	this Emissions U	nit for VE Tracking	(limit to	
	NA					
4.	ID Numbers or Descriptions	s of Emission Un	nits with this Emis	ssion Point in Commo	on:	
	None					
5.	Discharge Type Code: V	6. Stack Heig 28	ht: feet	7. Exit Diameter: 1.44	feet	
8.	Exit Temperature: 700 °F	9. Actual Vol Rate: 11,6	umetric Flow 37 acfm	10. Water Vapor:	%	
11	. Maximum Dry Standard Flo	ow Rate: dscfm	12. Nonstack E	mission Point Height	: feet	
13.	. Emission Point UTM Coord	linates:				
	Zone: 17 East (km): 418.84 North (km): 3240.90					
14	. Emission Point Comment (l	imit to 200 chara	acters):			

Emissions	Unit.	Information	Section	2	of	4

# E. SEGMENT (PROCESS/FUEL) INFORMATION (All Emissions Units)

Segment Description and Rate: Segment \_\_1\_ of \_\_1\_

1. Segment Description (Process/Fuel Type) (limit to 500 characters):						
Natural gas fired reciprocating internal combustion engine driving a natural gas compressor, operating full time.						
-						
2. Source Classification Code	e (SCC):	3. SCC Units	s:	l		
2-02-002-54		mi	llion	cubic feet burned		
4 Manimum Haushy Datas	5. Maximum A	Appual Data:	6	Estimated Annual Activity		
4. Maximum Hourly Rate:			0.	•		
0.0159	138	3.98		Factor: NA		
7. Maximum % Sulfur:	8. Maximum 9	% Ash:	9.	Million Btu per SCC Unit:		
0.03	0	.0		1040		
	<u> </u>			70.10		
10. Segment Comment (limit t	o 200 characters	<b>)</b> :		;		
Percent Sulfur is based on max	ximum Federal E	nergy Regulato	ry Co	mmission (FERC) limit of		
10 gr S/100scf and gas density			•	, ,		
10 gr 5/100ser and gas density	01 0.0455 10/501	<u>-</u>				
Segment Description and Ra	ate: Segment_N	A_ of				
1. Segment Description (From	1. Segment Description (Process/Fuel Type) (limit to 500 characters):					
2. Source Classification Code	e (SCC):	CC Units:				
	, ,					
4 Mayimym Hayah, Data	5. Maximum A	Annual Datas	6.	Estimated Annual Activity		
4. Maximum Hourly Rate:	3. Maximum A	Annual Kate:	0.			
			l	Factor:		
7. Maximum % Sulfur:	8. Maximum 9	% Ash:	9.	Million Btu per SCC Unit:		
/: Ividamidan / v Sundi:	0, 1,144			F		
	<u>L</u>					
10. Segment Comment (limit t	to 200 characters	):				
1						

Emissions	Unit	Information	Section	2	οf	4
	$\sim$ 111.	***********		_	O.	-

# F. EMISSIONS UNIT POLLUTANTS (All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
	Device Code	Device Code	Regulatory Code
VOC			EL
SO <sub>2</sub>			EL
PM/PM <sub>10</sub>			EL
NO <sub>x</sub>			EL
СО			EL
HAPs			NS
"			
			• • • • • • • • • • • • • • • • • • •
		,	

<b>Emissions Unit Information S</b>	Section	2	of	4
Pollutant Detail Information	Page	1	of	6

### G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Potential/Fugitive Emissions	•
1. Pollutant Emitted: NOX	2. Total Percent Efficiency of Control:
3. Potential Emissions: 35.27 lb/hour 15	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions:	to tons/year
6. Emission Factor: 8.0 g/hp-hr	7. Emissions
Reference: Test data for similar unit	Method Code:
8. Calculation of Emissions (limit to 600 characteristics)	cters):
(8.0 g/hp-hr)(2000 bhp)(1lb/453.6 g) = 35.27 lb (35.27 lb/hr)(8760 hr/yr)(1 ton/2000 lb) = 154.5	
9. Pollutant Potential/Fugitive Emissions Comr	nent (limit to 200 characters):
Expected emission rate based upon test data for	modified similar engine.
Allowable Emissions Allowable Emissions	_NA_ of
1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions:
	lb/hour tons/year
5. Method of Compliance (limit to 60 character	rs):
6. Allowable Emissions Comment (Desc. of Op	perating Method) (limit to 200 characters):

<b>Emissions Unit Information Section</b>	2	_ of _	4
Pollutant Detail Information Page	2 _	_ of _	6

# G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Potential/Fugitive Emissions	
1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control:
3. Potential Emissions: 6.04 lb/hour 26.	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions:	to tons/year
6. Emission Factor: 2.0 g/hp-hr	7. Emissions
Reference: Test data for similar unit	Method Code:
8. Calculation of Emissions (limit to 600 charac	eters):
(2.0 g/hp-hr)(2000 bhp)(1lb/453.6 g) = 8.82 lb/h (8.82 lb/hr)(1 ton/2000 lb)(8760 hr/1 yr) = 38.6	
9. Pollutant Potential/Fugitive Emissions Comm Expected emission rate based upon test data for	
Allowable Emissions Allowable Emissions	NA_ of
Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions:
	lb/hour tons/year
5. Method of Compliance (limit to 60 character	s):
6. Allowable Emissions Comment (Desc. of Op	erating Method) (limit to 200 characters):

<b>Emissions Unit Information Se</b>	ection	2	of_	4
Pollutant Detail Information P.	age	3	of	6

# G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Potential/Fugitive Emissions	
Pollutant Emitted: VOC	2. Total Percent Efficiency of Control:
3. Potential Emissions:  0.44 lb/hour 1.9	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions:	
[ ] 1 [ ] 2 [ ] 3	to tons/year
6. Emission Factor: 0.44 lb/hr	7. Emissions
Reference: Test Data	Method Code:
8. Calculation of Emissions (limit to 600 charac	ters):
9. Pollutant Potential/Fugitive Emissions Comm  Expected emission rate based upon test data for	
Allowable Emissions Allowable Emissions N  1. Basis for Allowable Emissions Code:	IA of 2. Future Effective Date of Allowable
1. Danie 101 : Mo Wales Emilione Court	Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions:
	lb/hour tons/year
5. Method of Compliance (limit to 60 character	s):
6. Allowable Emissions Comment (Desc. of Op	

<b>Emissions Unit Information Section</b>	2	of_	4
Pollutant Detail Information Page	4	of_	6

### G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Potential/Fugitive Emissions				
1. Pollutant Emitted: SO2	2. Total Percent Efficiency of Control:			
	4. Synthetically Limited? [ ]			
5. Range of Estimated Fugitive Emissions:	to tons/year			
6. Emission Factor: 10 grains/100 scf  Reference: FERC maximum allowable	7. Emissions Method Code:			
8. Calculation of Emissions (limit to 600 charac				
(10.0 gr S/100 scf)(0.0159 MM scf/hr)(1 lb/7000 gr) = 0.23 lb S/hr (0.23 lb S/hr)(2 lb/lb S) = 0.45 lb SO2/hr (0.45 lb SO2/hr)(8760 hr/yr)(1 ton/2000 lb) = 1.98 ton/yr				
9. Pollutant Potential/Fugitive Emissions Communication Projected fuel use based on test data. SO2 emission factor is based on maximum Fede limit of 10 gr S/100 scf and gas density of 0.045	ral Energy Regulatory Commission (FERC)			
Allowable Emissions Allowable Emissions	NA_ of			
1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:			
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions:			
	lb/hour tons/year			
5. Method of Compliance (limit to 60 characte	rs):			
6. Allowable Emissions Comment (Desc. of Op	perating Method) (limit to 200 characters):			

Emissions Unit Information Section	2	_ of _	4
Pollutant Detail Information Page	5	of	6

### G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Potential/Fugitive Emissions			
1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control:		
3. Potential Emissions: 0.16 lb/hour 0.7	4. Synthetically Limited? [ ]		
5. Range of Estimated Fugitive Emissions:			
	totons/year		
6. Emission Factor: 0.00999 lb/MM Btu	7. Emissions		
Reference: AP-42 Section 3.2 Table 3.3	2-2, 4/00 Supplement E Method Code:		
8. Calculation of Emissions (limit to 600 charac	eters):		
(0.00999 lb/MM Btu)(16.5 MM Btu/hr) = 0.16 l (0.16 lb/hr)(8760 hr/yr)(1 ton/2000 lb) = 0.72 to			
9. Pollutant Potential/Fugitive Emissions Comm Projected fuel use based on test data.			
Allowable Emissions Allowable Emissions	NA_ of		
1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions:		
	lb/hour tons/year		
5. Method of Compliance (limit to 60 character	's):		
6. Allowable Emissions Comment (Desc. of Op			
o. Thoward Emissions Comment (Best. of Op	(mm to 200 timesto).		

<b>Emissions Unit Information Section</b>	n2_	_ of _	4_	
Pollutant Detail Information Page	6	of	6	

## G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

1. Pollutant Emitted: HAPs   2. Total Percent Efficiency of Control:	Potential/Fugitive Emissions	
0.76   lb/hour   3.3   tons/year   Limited? [ ]	1. Pollutant Emitted: HAPs	2. Total Percent Efficiency of Control:
0.76   lb/hour   3.3   tons/year   Limited? [ ]	3. Potential Emissions:	4. Synthetically
[ ] 1 [ ] 2 [ ] 3		1 .
[ ] 1 [ ] 2 [ ] 3	5. Range of Estimated Fugitive Emissions:	
Reference: GRI-HAPCalc 3.0  8. Calculation of Emissions (limit to 600 characters):  (0.172 g/hp-hr)(2,000 hp-hr)(1 lb/453.6 g) = 0.758 lb/hr (0.758 lb/hr)(8760 hr/yr)(1 ton/2000 lb) = 3.32 ton/yr  9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):  Detailed calculations provided in Attachment D. HAP emissions are included in VOC emissions.  Allowable Emissions Allowable Emissions Code:  2. Future Effective Date of Allowable Emissions:	[ ] 1 [ ] 2 [ ] 3	to tons/year
8. Calculation of Emissions (limit to 600 characters):  (0.172 g/hp-hr)(2,000 hp-hr)(1 lb/453.6 g) = 0.758 lb/hr (0.758 lb/hr)(8760 hr/yr)(1 ton/2000 lb) = 3.32 ton/yr  9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):  Detailed calculations provided in Attachment D. HAP emissions are included in VOC emissions.  Allowable Emissions Allowable EmissionsNA of  1. Basis for Allowable Emissions Code:  2. Future Effective Date of Allowable Emissions:  3. Requested Allowable Emissions and Units:  4. Equivalent Allowable Emissions:    lb/hour   tons/year	6. Emission Factor: 0.172 g/hp-hr	i i
(0.172 g/hp-hr)(2,000 hp-hr)(1 lb/453.6 g) = 0.758 lb/hr (0.758 lb/hr)(8760 hr/yr)(1 ton/2000 lb) = 3.32 ton/yr  9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):  Detailed calculations provided in Attachment D. HAP emissions are included in VOC emissions.    NA_ of	Reference: GRI-HAPCalc 3.0	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):  Detailed calculations provided in Attachment D. HAP emissions are included in VOC emissions.  Allowable Emissions Allowable EmissionsNA of  1. Basis for Allowable Emissions Code:  2. Future Effective Date of Allowable Emissions: 3. Requested Allowable Emissions and Units: 4. Equivalent Allowable Emissions:	8. Calculation of Emissions (limit to 600 charac	eters):
Detailed calculations provided in Attachment D. HAP emissions are included in VOC emissions.    Allowable Emissions   NA_ of     1. Basis for Allowable Emissions Code:   2. Future Effective Date of Allowable Emissions:     3. Requested Allowable Emissions and Units:   4. Equivalent Allowable Emissions:     1. Basis for Allowable Emissions Code:   2. Future Effective Date of Allowable Emissions:     1. Equivalent Allowable Emissions:     1. Basis for Allowable Emissions Code:   2. Future Effective Date of Allowable Emissions:     1. Equivalent Allowable Emissions:     1. Basis for Allowable Emissions Code:   2. Future Effective Date of Allowable Emissions:     1. Equivalent Allowable Emissions:     1. Equiv		
<ol> <li>Basis for Allowable Emissions Code:</li> <li>Future Effective Date of Allowable Emissions:</li> <li>Requested Allowable Emissions and Units:</li> <li>Equivalent Allowable Emissions:</li> <li>Ib/hour tons/year</li> <li>Method of Compliance (limit to 60 characters):</li> </ol>	Detailed calculations provided in Attachment D.	nent (mint to 200 characters).
3. Requested Allowable Emissions and Units:  4. Equivalent Allowable Emissions:    lb/hour   tons/year	Allowable Emissions Allowable Emissions	NA of
lb/hour tons/year  5. Method of Compliance (limit to 60 characters):	Basis for Allowable Emissions Code:	
5. Method of Compliance (limit to 60 characters):	3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions:
		lb/hour tons/year
	5. Method of Compliance (limit to 60 character	s):
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):		
	6. Allowable Emissions Comment (Desc. of Op	erating Method) (limit to 200 characters):

Emissions Unit Information Section	2	of	4
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# H. VISIBLE EMISSIONS INFORMATION (Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emis	<u> </u>
1. Visible Emissions Subtype: VE20	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: 20 % Maximum Period of Excess Opacity Allo	Exceptional Conditions: % wed: min/hour
4. Method of Compliance:	
5. Visible Emissions Comment (limit to 200	characters):
Subject to 62-296-320(4)(b)1 General Visible	e Emissions Standards.
I. CONTINUOUS M	10NITOR INFORMATION
, ,	its Subject to Continuous Monitoring)
Continuous Monitoring System: Continuo	ous MonitorNA_ of
1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	[ ] Rule [ ] Other
4. Monitor Information:	
Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 2	200 characters):
,	*

Emissions	Unit	Informa	ation	Section	2	of	4	

# J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION (Regulated Emissions Units Only)

### **Supplemental Requirements**

1.	Process Flow Diagram
	[ ] Attached, Document ID: [ ] Not Applicable [X] Waiver Requested
2.	Fuel Analysis or Specification
	[ ] Attached, Document ID: [ ] Not Applicable [X] Waiver Requested
3.	Detailed Description of Control Equipment
	[ ] Attached, Document ID: [X] Not Applicable [ ] Waiver Requested
4.	Description of Stack Sampling Facilities
	[ ] Attached, Document ID: [ ] Not Applicable [X] Waiver Requested
5.	Compliance Test Report
	[ ] Attached, Document ID:
	[ ] Previously submitted, Date:
	[X] Not Applicable
6.	Procedures for Startup and Shutdown
	[ ] Attached, Document ID: [ ] Not Applicable [X] Waiver Requested
7.	Operation and Maintenance Plan
	[ ] Attached, Document ID: [X] Not Applicable [ ] Waiver Requested
8.	Supplemental Information for Construction Permit Application
	[X] Attached, Document ID:_Narrative [ ] Not Applicable
9.	Other Information Required by Rule or Statute
	[ ] Attached, Document ID: [X] Not Applicable
10	. Supplemental Requirements Comment:
"	O J
	ocess flow diagrams and fuel analyses have been previously submitted.  upplemental information is provided in the narrative description accompanying these forms.
	tachment E contains an emissions test report for the pre-modification unit.
^\	decimient is contains an emissions test report for the pre modification diff.

<b>Emissions Unit Information Section</b>	2	of	4	
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### Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation
[ ] Attached, Document ID: [X] Not Applicable
12. Alternative Modes of Operation (Emissions Trading)
[ ] Attached, Document ID: [X] Not Applicable
13. Identification of Additional Applicable Requirements
[ ] Attached, Document ID: [X] Not Applicable
14. Compliance Assurance Monitoring Plan
[ ] Attached, Document ID: [X] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) NA
[ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:
[ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:
[ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:
[ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:
[ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID:
[ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID:
[ ] Not Applicable

Emissions	Unit	Information	Section	3	of	4

#### III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

## A. GENERAL EMISSIONS UNIT INFORMATION (All Emissions Units)

#### **Emissions Unit Description and Status**

1. Type of Emissions Unit Addressed in This Section: (Check one)
[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).
[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.
[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.
2. Regulated or Unregulated Emissions Unit? (Check one)
[ ] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.
[X] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.
3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
Emergency generator Waukesha Model H24GL rated at 585 bhp
4. Emissions Unit Identification Number: [ ] No ID ID: GEN03 [ ] ID Unknown
5. Emissions Unit Startup Status Code: Date: 12/01/01 C C 7. Emissions Unit Major Group SIC Code: 49 8. Acid Rain Unit?
9. Emissions Unit Comment: (Limit to 500 Characters) The proposed generator engine will be a Waukesha Model H24GL reciprocating engine rated at 440 kW (585 bhp). Fuel will be exclusively natural gas from the FGT's gas pipeline. The unit will be operated no more than 500 hours per year. This unit will replace two existing Waukesha Model LRO, 395 bhp emergency generators.

<b>Emissions</b>	Unit	Information	Section	3	of	4	
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Emissions	Unit	Control	Eq	uipn	<u>gent</u>
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1. Control Equipment/Method Description (Limit to 200 characters per device or method):
None
•
2. Control Device or Method Code(s): NA
Emissions Unit Details

1.	Package Unit: Manufacturer: Waukesha		Model Number:	H24GL
2.	Generator Nameplate Rating:	0.440	MW	
3.	Incinerator Information:			
	Dwell Temperature:			°F
	Dwell Time:			seconds
	Incinerator Afterburner Temperature:			°F

<b>Emissions Unit Information Section</b>	3	of	4	
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## B. EMISSIONS UNIT CAPACITY INFORMATION (Regulated Emissions Units Only)

### **Emissions Unit Operating Capacity and Schedule**

1. Maximum Heat Input Rate:	4.11	mmBtu/hr	
2. Maximum Incineration Rate: NA	A lb/hr		tons/day
3. Maximum Process or Throughpu	t Rate: NA		
4. Maximum Production Rate: NA	\		
5. Requested Maximum Operating S	Schedule:		
	hours/day		days/week
	weeks/year		500 hours/year
6. Operating Capacity/Schedule Con	mment (limit to 2	00 characters):	
Heat input is 4.11 MM Btu/hr based Schedule will be limited to 500 hours	•	cations.	

<b>Emissions Unit Information Section</b>	3	of	4	
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## C. EMISSIONS UNIT REGULATIONS2 (Regulated Emissions Units Only)

### **List of Applicable Regulations**

	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
62-296.320(4)(b)1 General Visible Emissions	
Standards	
Stalluarus	

	Emissions	Unit	Information	Section	3	of	4	
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# D. EMISSION POINT (STACK/VENT) INFORMATION (Regulated Emissions Units Only)

### **Emission Point Description and Type**

Identification of Point on Pl Flow Diagram? GEN03	•••			
3. Descriptions of Emission Po 100 characters per point):	oints Comprising	this Emissions U	nit for VE Tracking (	(limit to
NA				
4. ID Numbers or Description	s of Emission Ur	nits with this Emis	ssion Point in Commo	on:
None				
5. Discharge Type Code: V	6. Stack Heig 20	ht: feet	7. Exit Diameter: 0.67	feet
8. Exit Temperature: 842 °F	9. Actual Vol Rate: 291	umetric Flow 1 acfm	10. Water Vapor:	%
11. Maximum Dry Standard Flo	ow Rate:  dscfm	12. Nonstack Er	mission Point Height	feet
13. Emission Point UTM Coord	linates:			
Zone: 17	ast (km): 418.8	4 Nort	h (km): 3240.90	
14. Emission Point Comment (1	imit to 200 chara	acters):		•
This 585 bhp emergency generator will replace two existing emergency generators rated at 395 bhp each. The unit will not be operated more than 500 hours per year.				

Emissions Uni	t Information Section	3	of	4	
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## E. SEGMENT (PROCESS/FUEL) INFORMATION (All Emissions Units)

Segment Description and Rate: Segment \_\_1\_ of \_\_1\_

1. Segment Description (Prod	cess/Fuel Type)	(limit to 500 ch	aracters	):		
Natural gas fired reciprocating engine driving a 440 Kw generator, operating no more than 500 hours per year.						
2. Source Classification Code 2-02-002-54	e (SCC):	3. SCC Units		pic feet burned		
4. Maximum Hourly Rate: 0.00395	5. Maximum A	Annual Rate: 98		stimated Annual Activity actor: NA		
7. Maximum % Sulfur: 0.03	8. Maximum 0	% Ash: .0	9. N	Aillion Btu per SCC Unit: 1040		
10. Segment Comment (limit the Percent Sulfur is based on maximum 10 gr S/100scf and gas density)	kimum Federal E	nergy Regulato	ry Comr	nission (FERC) limit of		
Segment Description and Ra	ite: Segment _N	A_ of				
1. Segment Description (Prod	1. Segment Description (Process/Fuel Type ) (limit to 500 characters):					
2. Source Classification Code	e (SCC):	CC Units:				
4. Maximum Hourly Rate:	5. Maximum A	Annual Rate:	4	stimated Annual Activity actor:		
7. Maximum % Sulfur:	8. Maximum % Ash:		9. M	lillion Btu per SCC Unit:		
10. Segment Comment (limit t	o 200 characters	):				

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Ŀm	ISSIONS	Unit.	INIOFME	uon	Section	3	OI -	4	

## F. EMISSIONS UNIT POLLUTANTS (All Emissions Units)

1. Pollutant Emitted	2. Primary Control	3. Secondary Control	4. Pollutant
	Device Code	Device Code	Regulatory Code
voc			NS
SO <sub>2</sub>			NS
PM			NS
NO <sub>x</sub>			NS
СО			NS
PM <sub>10</sub>			NS
			,
		•	

Emissions Unit Information Section	3_	_ of _	4
Pollutant Detail Information Page	1	of	5

#### G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Potential/Fugitive Emissions	
1. Pollutant Emitted: NOX	2. Total Percent Efficiency of Control:
3. Potential Emissions:	4. Synthetically
	1.8 tons/year Limited? [X]
5. Range of Estimated Fugitive Emissions:	
	to tons/year
6. Emission Factor: 2.1 g/hp-hr	7. Emissions
Reference: Vendor's data	Method Code:
8. Calculation of Emissions (limit to 600 charac	cters):
(2.1 g/hp-hr)(585 hp)/453.6 g/lb) = 2.71 lb/hr (2.71 lb/hr)(8760 hr/yr)(1 ton/2000 lb) = 11.86 t	tpy
(2.71  lb/hr)(500  hr/yr)(1  ton/2000 lb) = 0.68  tpy	
9. Pollutant Potential/Fugitive Emissions Comr	ment (limit to 200 characters):
Operation limited to 500 hours per year.	
Allowable Emissions Allowable Emissions	_1 of1
Basis for Allowable Emissions Code:     OTHER	Future Effective Date of Allowable     Emissions: NA
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions:
NA	NA lb/hour 0.68 tons/year
5. Method of Compliance (limit to 60 character	rs):
Maintain record of hours of operation.	
6. Allowable Emissions Comment (Desc. of Op	perating Method) (limit to 200 characters):
Limitation on hours to 500 hrs/yr meets US EPA insignificant source for Title V purposes.	A's definition of an emergency generator as

<b>Emissions Unit Information Section</b>	3	_ of _	4
Pollutant Detail Information Page	2	_of_	5

# G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Potential/Fugitive Emissions	
1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control:
3. Potential Emissions: 1.81 lb/hour 7.9	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions:	to tons/year
6. Emission Factor: 1.4 g/hp-hr Reference: Vendor's data	7. Emissions Method Code: 5
8. Calculation of Emissions (limit to 600 charac	
(1.4 g/hp-hr)(585 hp)/453.6 g/lb) = 1.81 lb/hr (1.81 lb/hr)(8760 hr/yr)(1 ton/2000 lb) = 7.93 tp (1.81 lb/hr)(500 hr/yr)(1 ton/2000 lb) = 0.45 tpy	
9. Pollutant Potential/Fugitive Emissions Comr	nent (limit to 200 characters):
Operation limited to 500 hours per year.	
Allowable Emissions Allowable Emissions	1 of1
Basis for Allowable Emissions Code:     OTHER	Future Effective Date of Allowable     Emissions: NA
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions:
NA	NA lb/hour 0.45 tons/year
5. Method of Compliance (limit to 60 character	rs):
Maintain record of hours of operation.	
6. Allowable Emissions Comment (Desc. of Op	perating Method) (limit to 200 characters):
Limitation on hours to 500 hrs/yr meets US EPA insignificant source for Title V purposes.	A's definition of an emergency generator as

Emissions Unit Information Section	3	_ of _	4	
Pollutant Detail Information Page	3	of	5	

### G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Emissions-Limited and Preconstruction Review Pollutants Only)					
Potential/Fugitive Emissions					
1. Pollutant Emitted: VOC	2. Total Percent Efficiency of	Control:			
3. Potential Emissions:  0.31 lb/hour 1.3		ynthetically imited? [X]			
5. Range of Estimated Fugitive Emissions:	totons/ye	ear			
6. Emission Factor: 0.24 g/hp-hr	1	Emissions Method Code:			
Reference: Vendor's data		5			
8. Calculation of Emissions (limit to 600 charac	eters):				
Vendor factor for non-methane hydrocarbons (N	IMHC) = 0.24 g/hp-hr. Assume	e all is VOC.			
(0.24  g/hp-hr)(585  hp)/453.6  g/lb) = 0.31  lb/hr (0.31  lb/hr)(8760  hr/yr)(1  ton/2000 lb) = 1.36  tp	у				
(0.31  lb/hr)(500  hr/yr)(1  ton/2000  lb) = 0.08  tpy					
9. Pollutant Potential/Fugitive Emissions Comm	nent (limit to 200 characters):				
Allowable Emissions Allowable Emissions	1of1_				
Basis for Allowable Emissions Code:     OTHER	2. Future Effective Date of Emissions: NA	Allowable			
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Em	issions:			
NA	NA lb/hour 0.0	8 tons/year			
5. Method of Compliance (limit to 60 characters):					
Maintain record of hours of operation.					
6. Allowable Emissions Comment (Desc. of Op	erating Method) (limit to 200 c	haracters):			
Limitation on hours to 500 hrs/yr meets US EPA insignificant source for Title V purposes.	A's definition of an emergency g	enerator as			

Emissions Unit Information Section	_3_	_ of _	_4	_
Pollutant Detail Information Page	4	of	5	

# G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Potential/Fugitive Emissions					
1. Pollutant Emitted: SO2 2. Total Percent Efficiency of Control:					
3. Potential Emissions:  0.11 lb/hour 0.4	4. Synthetically Limited? [X]				
5. Range of Estimated Fugitive Emissions:	to tons/year				
6. Emission Factor: 10 gr S/100 scf	7. Emissions				
Reference: Vendor's data	Method Code: 2				
8. Calculation of Emissions (limit to 600 charac	eters):				
(0.0564 lb S/hr)(2 lb SO2/lb S) = 0.113 lb SO2/ (0.113 lb SO2/hr)(8760 hr/yr)(1 ton/2000 lb) =	(10  gr S/100  scf)(0.00395  MMscf/hr)(1  lb/7000  gr) = 0.0564  lb S/hr $ (0.0564  lb S/hr)(2  lb SO2/lb S) = 0.113  lb SO2/hr $ $ (0.113  lb SO2/hr)(8760  hr/yr)(1  ton/2000 lb) = 0.49  ton/yr $ $ (0.113  lb SO2/hr)(500  hr/yr)(1  ton/2000 lb) = 0.03  ton/yr$				
9. Pollutant Potential/Fugitive Emissions Comm	ment (limit to 200 characters):				
SO2 emission factor is based on maximum Fede limit of 10 gr S/100 scf and gas density of 0.045					
Allowable Emissions Allowable Emissions	1 of1				
Basis for Allowable Emissions Code:     OTHER	2. Future Effective Date of Allowable Emissions: NA				
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions:				
NA	NA lb/hour 0.03 tons/year				
5. Method of Compliance (limit to 60 character	rs):				
Maintain record of hours of operation.					
6. Allowable Emissions Comment (Desc. of Op	perating Method) (limit to 200 characters):				
Limitation on hours to 500 hrs/yr meets US EPA insignificant source for Title V purposes.	A's definition of an emergency generator as				

Emissions Unit Information Section _	3	_ of _	4
Pollutant Detail Information Page	5	of	5

# G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Potential/Fugitive Emissions					
1. Pollutant Emitted: PM	PM 2. Total Percent Efficiency of Control:				
3. Potential Emissions: 0.04 lb/hour 0.1	8 tons/year 4. Synthetically Limited? [X]				
5. Range of Estimated Fugitive Emissions:					
[ ] 1 [ ] 2 [ ] 3	totons/year				
6. Emission Factor: 0.00999 lb/MM Btu	7. Emissions				
Reference: AP-42 Section 3.2 Table 3.	2-2, 4/00 Supplement E Method Code:				
8. Calculation of Emissions (limit to 600 charac	eters):				
(0.00999 lb/MM Btu)(4.11 MM Btu/hr) = 0.04 l (0.04 lb/hr)(8760 hr/yr)(1 ton/2000 lb) = 0.18 to (0.04 lb/hr)(500 hr/yr)(1 ton/2000 lb) = 0.01 ton	on/y				
9. Pollutant Potential/Fugitive Emissions Comm	nent (limit to 200 characters):				
2. Constant Colombia agrico Emissione Commi	(				
Based on vendor's fuel use data.					
Allowable Emissions Allowable Emissions	1 of1				
Basis for Allowable Emissions Code:     OTHER	Future Effective Date of Allowable     Emissions: NA				
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions:				
NA	NA lb/hour 0.01 tons/year				
5. Method of Compliance (limit to 60 character	rs):				
Maintain record of hours of operation.					
6. Allowable Emissions Comment (Desc. of Op	erating Method) (limit to 200 characters):				
Limitation on hours to 500 hrs/yr meets US EPA insignificant source for Title V purposes.	A's definition of an emergency generator as				

Emissions	Unit	Information	Section	3	of	4

### H. VISIBLE EMISSIONS INFORMATION (Only Regulated Emissions Units Subject to a VE Limitation)

<u>Visible Emissions Limitation:</u> Visible Emissions Limitation \_\_\_1\_ of \_\_\_1\_ 1. Visible Emissions Subtype: 2. Basis for Allowable Opacity: VE20 [X] Rule 3. Requested Allowable Opacity: **Normal Conditions:** 20% **Exceptional Conditions:** % Maximum Period of Excess Opacity Allowed: min/hour 4. Method of Compliance: 5. Visible Emissions Comment (limit to 200 characters): Subject to 62-296-320(4)(b)1 General Visible Emissions Standards. I. CONTINUOUS MONITOR INFORMATION (Only Regulated Emissions Units Subject to Continuous Monitoring) Continuous Monitoring System: Continuous Monitor NA of 1. Parameter Code: 2. Pollutant(s): 3. CMS Requirement: Rule Other 4. Monitor Information: Manufacturer: Model Number: Serial Number: 5. Installation Date: 6. Performance Specification Test Date: 7. Continuous Monitor Comment (limit to 200 characters):

<b>Emissions</b>	Unit In	formation	Section	3	of	4

# J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION (Regulated Emissions Units Only)

### **Supplemental Requirements**

1.	Process Flow Diagram						
	[ ] Attached, Document ID: [ ] Not Applicable [X] Waiver Requested						
2.	Fuel Analysis or Specification						
	[ ] Attached, Document ID: [ ] Not Applicable [X] Waiver Requested						
3.	Detailed Description of Control Equipment						
	[ ] Attached, Document ID: [X] Not Applicable [ ] Waiver Requested						
4.	Description of Stack Sampling Facilities						
	[ ] Attached, Document ID: [ ] Not Applicable [X] Waiver Requested						
5.	Compliance Test Report						
	[ ] Attached, Document ID:						
	Previously submitted, Date:						
	[X] Not Applicable						
6.	Procedures for Startup and Shutdown						
	[ ] Attached, Document ID: [ ] Not Applicable [X] Waiver Requested						
7.	Operation and Maintenance Plan						
	[ ] Attached, Document ID: [X] Not Applicable [ ] Waiver Requested						
8.	Supplemental Information for Construction Permit Application						
	[X] Attached, Document ID: Attach. C [ ] Not Applicable						
9.	Other Information Required by Rule or Statute						
	[ ] Attached, Document ID: [ X ] Not Applicable						
10	10. Supplemental Requirements Comment:						
All	supplemental information has been previously submitted and has not changed.						

### Emissions Unit Information Section \_\_\_3\_ of \_\_\_4\_

### Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation
[ ] Attached, Document ID: [X] Not Applicable
12. Alternative Modes of Operation (Emissions Trading)
[ ] Attached, Document ID: [X] Not Applicable
13. Identification of Additional Applicable Requirements
[ ] Attached, Document ID: [X] Not Applicable
14. Compliance Assurance Monitoring Plan
[ ] Attached, Document ID: [X] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) NA
[ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
Attached, Document ID:
[ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
Attached, Document ID:
[ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.)
Attached, Document ID:
[ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
Attached, Document ID:
[ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)
Attached, Document ID:
[ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)
Attached, Document ID:
[ ] Not Applicable

#### III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

### A. GENERAL EMISSIONS UNIT INFORMATION (All Emissions Units)

#### **Emissions Unit Description and Status**

		<u> </u>							
1.	Type of Emission	s Unit Addressed in This	Section: (Check one)						
[	This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).								
[	This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.								
[X	[X] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.								
2.	Regulated or Unr	egulated Emissions Unit	? (Check one)						
[	[ ]The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.								
[X	[X] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.								
3.	Description of En	nissions Unit Addressed i	in This Section (limit to 60 cl	naracters):					
Fu	gitive emissions fro	om component leaks.							
4.	Emissions Unit Id	lentification Number: [X] ID Unknown							
5.	Emissions Unit Status Code: C	6. Initial Startup Date: 12/01/01	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit? [ ]					
9.	Emissions Unit C	omment: (Limit to 500 C	haracters)						
Th	9. Emissions Unit Comment: (Limit to 500 Characters)  These are new fugitive leak emissions from new components (valves, flanges, etc.)								

Emissions	Unit	Information	Section	4	of	4

Emissions	Unit	<b>Control</b>	Eq	uipn	nent

1. Control Equipment/Method Description (	(Limit to 200 characters per d	evice or method):
NA		
2. Control Device or Method Code(s):	NA	
2. Control Device or Method Code(s):		
Emissions Unit Details		
1. Package Unit:		
Manufacturer:	Model Number:	
2. Generator Nameplate Rating:	MW	
3. Incinerator Information:  Dwell Temperature:		°F
Dwell Time:		seconds
Incinerator Afterburner Temperature:		°F

<b>Emissions Unit Information Section</b>	4	of	4
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## B. EMISSIONS UNIT CAPACITY INFORMATION (Regulated Emissions Units Only)

### **Emissions Unit Operating Capacity and Schedule**

1.	Maximum Heat Input Rate:	mmBtu/hr			
2.	Maximum Incineration Rate:	lb/hr	tons/day		
3.	Maximum Process or Throughp	ut Rate:			
4.	Maximum Production Rate:				
5.	Requested Maximum Operating	Schedule:			
	24	hours/day		7	days/week
	52	weeks/year		8760	hours/year
6.	Operating Capacity/Schedule Co	omment (limit to	200 characters	3):	
ļ					
1					

<b>Emissions Unit Information Sec</b>	tion 4	of	4
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## C. EMISSIONS UNIT REGULATIONS (Regulated Emissions Units Only)

### List of Applicable Regulations

None	

<b>Emissions</b>	Unit	Infor	mation	Section	4	of	4

# D. EMISSION POINT (STACK/VENT) INFORMATION (Regulated Emissions Units Only)

### **Emission Point Description and Type**

1. Identification of Point on Pl		2. Emission Po		
Flow Diagram? FUGITI	VE		4	
3.				
4. ID Numbers or Description	s of Emission Ur	nits with this Emis	ssion Point in Comm	on:
	N	A		
5. Discharge Type Code:	6. Stack Heig		7. Exit Diameter:	
F	NA	feet	NA NA	feet
8. Exit Temperature:		umetric Flow	10. Water Vapor:	<del></del>
77 °F	Rate: NA	acfm	NA	%
11. Maximum Dry Standard Flo	w Rate:	12. Nonstack E	mission Point Height	•
NA	dscfm		0	feet
13. Emission Point UTM Coord	linates:			
Zone: 17 E	ast (km): 418.8	4 Nort	h (km): 3240.90	
14. Emission Point Comment (1	imit to 200 chara	cters):		
<u> </u>				

Emissions	Unit	Information	Section	4	of	4

# E. SEGMENT (PROCESS/FUEL) INFORMATION (All Emissions Units)

Segment	<b>Description</b>	and Rate:	Segment	1	of :	Í
			0			

1. Segment Description (Process/Fuel Type) (limit to 500 characters):					
Fugitive emissions from component leaks.					
2. Source Classification Code (SCC): 3. SCC Units:					
3-10-888-11			A cubic feet produced		
4. Maximum Hourly Rate:	5. Maximum At 0	nnual Rate:	6. Estimated Annual Activity Factor: component count		
7. Maximum % Sulfur: NA	8. Maximum % NA		9. Million Btu per SCC Unit: NA		
10. Segment Comment (limit to			· -		
1			ors provided in EPA publication		
EPA-453/R-95-017, Novembe	er 1995, "Protocol	for Equipment	Leak Emission Estimates		
Segment Description and Rate: Segment NA_ of NA_					
1. Segment Description (Proc	cess/Fuel Type) (	limit to 500 ch	aracters):		
2. Source Classification Code	e (SCC):	3. SCC Unit	s:		
4. Maximum Hourly Rate:	5. Maximum Ai	nnual Rate:	6. Estimated Annual Activity Factor:		
7. Maximum % Sulfur:	8. Maximum %	Ash:	9. Million Btu per SCC Unit:		
10. Segment Comment (limit to	o 200 characters):		· · · · · · · · · · · · · · · · · · ·		
<ul><li>4. Maximum Hourly Rate:</li><li>7. Maximum % Sulfur:</li></ul>	5. Maximum Ai  8. Maximum %	nnual Rate: Ash:	6. Estimated Annual Activity Factor:		

## F. EMISSIONS UNIT POLLUTANTS (All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
VOC			NS
	-		
:			

<b>Emissions Unit Information Section</b>	4_	_ of _	_4_
Pollutant Detail Information Page	1	of	1

# G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Emissions-Limited and Precons	truction Review Polluta	ants Only)				
Potential/Fugitive Emissions						
1. Pollutant Emitted: VOC 2. Total Percent Efficiency of Control:						
	20 tons/year	4. Synthetically Limited? [ ]				
5. Range of Estimated Fugitive Emissions:  [ ] 1 [ ] 2 [ ] 3	to	tons/year				
6. Emission Factor: lb/hr/component  Reference: EPA-453/R-95-01 Equipment Leak EmissionEstimates"	7, Protocol for	7. Emissions Method Code: 5				
8. Calculation of Emissions (limit to 600 charac	eters):					
(EPA factor for specific component type) (numb Assume non-methane/non-ethane fraction is 5% (tons/year)(2000 lb/ton)(1 yr/8760 hr) = lb/hr See Attachment D for details.	•	cific type) = tpy.				
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):						
Factors vary by component type. See Attachment D for specific factors and calculations.						
Allowable Emissions NA of						
Basis for Allowable Emissions Code:     NA						
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions:					
	lb/hour	tons/year				
5. Method of Compliance (limit to 60 character	rs):					
6. Allowable Emissions Comment (Desc. of Op	erating Method) (limit to	200 characters):				

Emissions	Unit	<b>Information</b>	Section	4	of	4

### H. VISIBLE EMISSIONS INFORMATION (Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation NA of 2. Basis for Allowable Opacity: 1. Visible Emissions Subtype: [ ] Other [ ] Rule 3. Requested Allowable Opacity: **Normal Conditions:** % **Exceptional Conditions:** % Maximum Period of Excess Opacity Allowed: min/hour 4. Method of Compliance: 5. Visible Emissions Comment (limit to 200 characters): I. CONTINUOUS MONITOR INFORMATION (Only Regulated Emissions Units Subject to Continuous Monitoring) Continuous Monitoring System: Continuous Monitor NA of 2. Pollutant(s): 1. Parameter Code: 3. CMS Requirement: [ ] Rule [ ] Other 4. Monitor Information: Manufacturer: Model Number: Serial Number: 5. Installation Date: 6. Performance Specification Test Date: 7. Continuous Monitor Comment (limit to 200 characters):

Emissions Un	it Information	Section	4	of	4

# J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION (Regulated Emissions Units Only)

### **Supplemental Requirements**

1.	Process Flow Diagram
	[ ] Attached, Document ID: [ ] Not Applicable [X] Waiver Requested
$\frac{1}{2}$	Fuel Analysis or Specification
	[ ] Attached, Document ID: [ ] Not Applicable [X] Waiver Requested
	Detailed Description of Control Equipment
٠.	[ ] Attached, Document ID: [X] Not Applicable [ ] Waiver Requested
4.	Description of Stack Sampling Facilities
	[ ] Attached, Document ID: [ ] Not Applicable [X] Waiver Requested
5.	Compliance Test Report
	[ ] Attached, Document ID:
	[ ] Previously submitted, Date:
	[X] Not Applicable
6.	Procedures for Startup and Shutdown
	[ ] Attached, Document ID:[X] Not Applicable [ ] Waiver Requested
7.	Operation and Maintenance Plan
	[ ] Attached, Document ID: [X] Not Applicable [ ] Waiver Requested
8.	Supplemental Information for Construction Permit Application
	[X] Attached, Document ID:_Narrative [ ] Not Applicable
9.	Other Information Required by Rule or Statute
	[ ] Attached, Document ID: [X] Not Applicable
10	. Supplemental Requirements Comment:
	ocess flow diagrams and fuel analyses have been previously submitted.
Su	pplemental information is provided in the narrative description accompanying these forms.

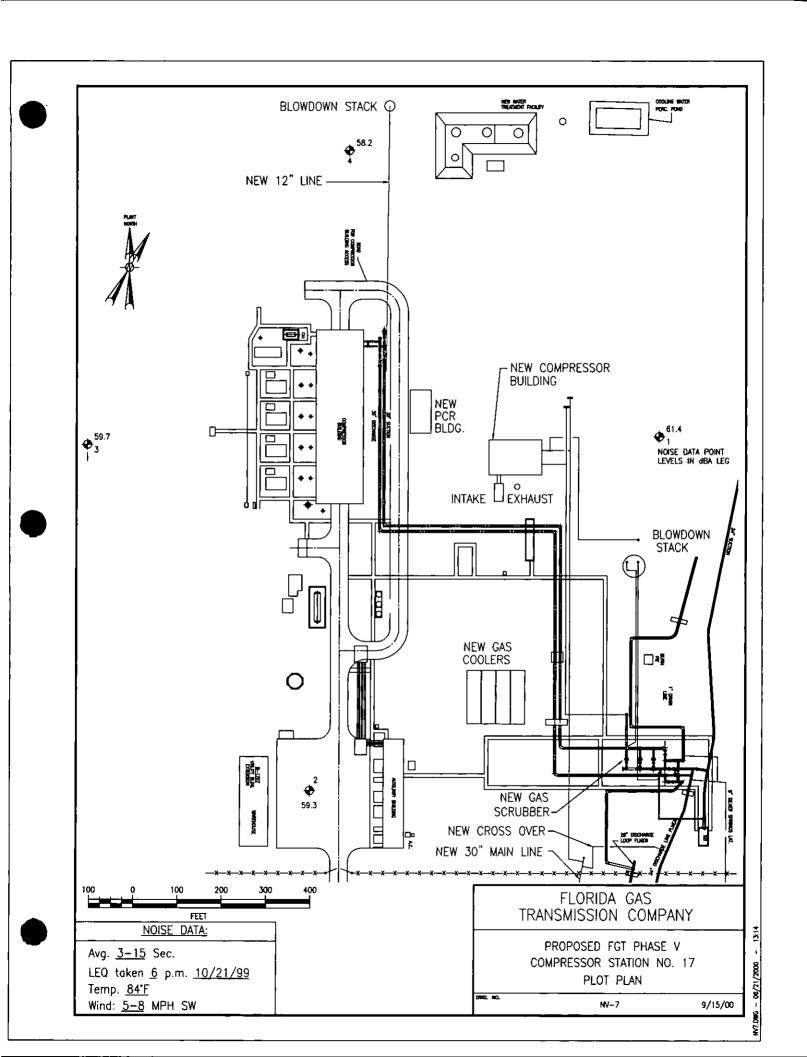
Emissions Unit Information Section	4	OI	4
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### Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation
[ ] Attached, Document ID:[X] Not Applicable
12. Alternative Modes of Operation (Emissions Trading)
[ ] Attached, Document ID:[X] Not Applicable
13. Identification of Additional Applicable Requirements
[ ] Attached, Document ID:[X] Not Applicable
14. Compliance Assurance Monitoring Plan
[ ] Attached, Document ID:[X] Not Applicable
15. Acid Rain Part Application (Hard-copy Required)
[ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
Attached, Document ID:
[ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
Attached, Document ID:
[ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.)
Attached, Document ID:
[ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
Attached, Document ID:
[ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)
Attached, Document ID:
[ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)
Attached, Document ID:
[X] Not Applicable

Attachment B

**Plot Plan** 



### Attachment C

**Vendor Information** 

Nuovo Pignone PGT-10B Turbine

Waukesha Model H24GL Reciprocating Engine

**Nuovo Pignone PGT-10B Turbine** 

Nuovo Pignone

FIRENZE

COMMESSA - JCB 1604865-66-67-68 CLIENTE - CUSTOMER
ENRON ENGINEERING COMPANY

LOCALITA: - PLANT LOCATION

FLORIDA/ALABAMA - USA

ESSA-JOB IMPIANTO-PLANT

**FGT PHASE V** 

THOLO-THE

### **EXPECTED EMISSION DATA**

L						_	
			T			1	
r					<u> </u>	1	
Г						ITEM	
12	GENERAL REVISION	AC	1		15/1200	1	
┢	CUSTOMER COMMENTS INCLUDED	AC			(12/11/09)	N. SOM38867/4	
- (1	EMESSO - ISSUED	AC	Carb belli	Figuro	04719599	LMGUA-LANG.	PAGNA-SHEET
REV	DESCRIZIONE - DESCRIPTION	PREPT	CC40 0470	APP APPRO	CATA : DATE	] A	1/2
II thus	Il presente documento e di proprieta NI,TP/O P/CRONE. A termine di legge ogni dinto e riservato			SOSTITUISOS IL - REPLACES			
Ths	This anouncent is the property of ROOAO PIGNORE, At lights are received according to law			SOSTILITO	DA - REPLACE	D BY	

Nuovo Pignone	е					
		IS	o			
% Load	100	90	80	70	60	50
Ho	15700	14130	12560	10990	9420	7850
Exhaust ACFM	203557	197108	190636	179898	167739	155705
Exhaust Mass Flow lb/s	103.54	103.45	103.33	100.07	95.56	90.81
ExhaustTemp °F	909	868	826	793	763	735
Fuel Flowrate MMbhu/hr	122.52	114.17	105.72	96.10	86.25	76.61
Fuel Heat val. Bluftb	20623	20823	20623	20823	20823	20823
Fuel Flow toth	5884	5483	5077	4615	4142	3679
NOx ppmvd @15%02	25	25	25	25	25	25
CO ppmvd @15%02	15	15	20	30	55	75
UHC ppww @15%/02	7	7	10	20	30	40
VOC LIM	0.29104	0.29104	0.41516	0.80036	1.14704	1.4552
UHC Lbh	1.36	1.36	1.94	3.74	5.36	6.8
NOx Lb/h	14.071	14.06	14.04	13.6	12.99	12.34
CO Lib/h	5.14	5.13	6.82	10.23	17.34	22.5

#### NOTES:

NOx values in ppmvd at ISO condition are contractually guaranteed. All other values per the above table neve to be considered as expected values not subject to any contractual obligation.

 In order to give in theis document the expected worst case conditions. All values herein are based on the eferenced percentage of load at Full Speed.

RE-VISED

RE-VISED

LINCULARIO PAGNICINET

A 2 / 3

Il presents discresses 6 propriate NEEVO PIGNONE Atenune di lagge agre delle è favoreta.

This document is the property of NEOVO PIGNONE. All rights are reserved according to here

SUSTITUITO DA- REPLACED BY

Waukesha Model H24GL Reciprocating Engine

| Signed: Mark J. Helgren | Date: 03/15/2001 | Signed: Joe Lange | Date: 03/15/2001

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### **HEAT REJECTION AND OPERATING DATA MODEL H24GL/GLD** 130° F (54° C) AUX. WATER TEMPERATURE 180° F (82° C) JACKET WATER TEMP.

		180° F (82° C) JACKET WATER TEMP.  ENGINE SPEED - RPM					
	BMEP (PSI)						
		1400	1500	1600	1700	1800	
	185		515	545	580	615	
	176	455	490	520	555	585	
DOMEO	160	415	445	475	505	530	
POWER	150	388	415	443	471	498	
(BHP)	125	323	346	369	392	415	
	100	258	277	295	314	332	
	75	194	208	222	235	249	
	50	129	138	148	157	166	
	185	=	6786	6882	6933	6978	
	176	6814	6831	6928	6980	7026	
BRAKE SPEC	160	6902	6923	7021	7076	7126	
FUEL CONS.	150	6967	6991	7089	7147	7199	
(BTU/BHP-HR)	125	7174	7208	7308	7374	7433	
(DIOIDIN -ING)	100	7484	7533	7636	7714	7784	
	75	8002	8076	8182	8281	8369	
	50	9037	9161	9275	9414	9539	
	185	_	3475	3760	4025	4290	
	176	3100	3330	3600	3855	4110	
FUEL	160	2855	3065	3320	3555	3790	
CONSUMPTION	150	2700	2905	3140	3365	3590	
	125	2315	2495	2700	2895	3085	
(BTU/HR) x 1000	100	1935	2085	2255	2420	2585	
	75	1550	1675	1810	1950	2085	
	50	1168	1268	1370	1477	1585	
	185		912	972	1024	1077	
	176	832	882	939	991	1042	
HEAT TO	160	781	830	881	931	981	
HEAT TO	150	749	798	845	893	942	
JACKET WATER	125	669	716	754	800	846	
(BTU/HR) x 1000	100	590	634	663	707	750	
	75	510	553	573	613	654	
	50	430	471	482	520	557	
	185		94	110	121	131	
	176	82	93	108	119	129	
	160	79.5	90.5	106	116		
HEAT TO	150	78 78	89	104	114	126	
LUBE OIL	125	74.5	85	100	1	124	
(BTU/HR) x 1000	100	74.3 71	81.5	95.5	110	120	
	75	67.5	77.5	95.5	105	115	
	·				101	110	
	185	64	73.5 185	87	96	105	
	176	- 151		213	243	273	
	160		173	199	228	256	
HEAT TO	150	132	152	175	201	227	
INTERCOOLER	125	120 89.5	138	160	184	208	
(BTU/HR) x 1000	100		104	123	142	162	
-	ł I	58.5	70 26	86	101	115	
	75	28	36	49	59	68.5	
	50	-2	2	12	17	22	

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**HEAT REJECTION AND OPERATING DATA** MODEL H24GL/GLD 130° F (54° C) AUX. WATER TEMPERATURE 180° F (82° C) JACKET WATER TEMP.

EN: DATE: Ref:

7779-43

# HEAT REJECTION AND OPERATING DATA MODEL H24GL/GLD 130° F (54° C) AUX. WATER TEMPERATURE

180° F (82° C) JACKET WATER TEMP.

	ВМЕР		EN	GINE SPEED - R	PM	
	(PSI)	1400	1500	1600	1700	1800
	185		73	79.5	83.5	87.5
	176	72	73	79	83	87.5
UEAT TO	160	71	72.5	78.5	82.5	87
HEAT TO	150	71	72.5	78	82.5	86.5
RADIATION	125	70	72	77.5	81.5	86
(BTU/HR) x 1000	100	69	71.5	76.5	81	85
	75	68	70.5	76	80	84
	50	67.5	69.5	75	79	83
	185	_	942	1030	1112	1196
	176	831	897	983	1061	1142
TOTAL ENERGY	160	756	818	898	970	1045
TOTAL ENERGY	150	709	769	844	913	984
IN EXHAUST	125	594	647	712	772	833
(BTU/HR) x 1000	100	483	527	581	632	684
	75	376	412	454	495	538
	50	275	302	332	364	397
	185	_	810	823	834	844
	176	799	808	821	831	842
EVILLIAT TEMP	160	794	804	816	827	838
EXHAUST TEMP	150	791	801	814	824	835
AFTER TURBINE	125	783	795	807	818	829
(+/- 50 °F)	100	775	789	800	812	823
	75	768	782	793	805	817
	50	760	776	786	798	811
	185	_	990	1065	1140	1215
	176	880	945	1020	1090	1160
INDUCTION	160	805	865	935	1000	1065
INDUCTION	150	760	815	885	945	1005
AIR FLOW	125	640	690	750	800	855
(SCFM)	100	525	565	615	660	705
	75	410	445	485	520	555
	50	300	325	355	385	410
	185	_	4520	4875	5205	5540
	176	4015	4315	4660	4980	5300
EVILLUAT	160	3675	3955	4275	4575	4870
EXHAUST	150	3465	3725	4035	4315	4600
GAS FLOW	125	2930	3155	3420	3670	3915
(LBS/HR)	100	2400	2585	2810	3020	3230
	75	1885	2030	2210	2380	2550
	50	1380	1495	1625	1755	1890

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# HEAT REJECTION AND OPERATING DATA MODEL H24GL/GLD 130° F (54° C) AUX. WATER TEMPERATURE

180° F (82° C) JACKET WATER TEMP.

	BMEP		F	Engine Speed - RP	M	
	(PSI)	1400	1500	1600	1700	1800
	185	<del>-</del>	2.66	2.66	2.54	2.42
	176	2.53	2.48	2.38	2.22	2.06
NO	160	2.50	2.42	2.35	2.18	2.00
NOx	150	2.47	2.39	2.32	2.17	2.01
Emissions	125	2.40	2.33	2.26	2.12	1.99
(g/bhp-hr)	100	2.34	2.26	2.17	2.08	1.98
	75	2.26	2.19	2.12	2.03	1.94
	50	2.10	2.02	1.94	1.90	1.86
	185	_	1.25	1.24	1.25	1.27
	176	1.34	1.28	1.29	1.31	1.34
CO	160	1.32	1.40	1.35	1.34	1.32
CO	150	1.38	1.42	1.39	1.31	1.23
Emissions	125	1.43	1.45	1.42	1.42	1.43
(g/bhp-hr)	100	1.52	1.51	1.51	1.51	1.52
	75	1.66	1.62	1.61	1.63	1.66
	50	1.85	1.88	1.87	1.86	1.85
	185	_	0.30	0.28	0.26	0.24
	176	0.36	0.30	0.28	0.26	0.24
NMHC	160	0.33	0.31	0.30	0.28	0.25
	150	0.35	0.32	0.31	0.29	0.27
Emissions	125	0.36	0.32	0.32	0.30	0.29
(g/bhp-hr)	100	0.38	0.35	0.35	0.32	0.30
	75	0.44	0.39	0.38	0.36	0.35
	50	0.51	0.47	0.45	0.44	0.44
	185		1.99	1.84	1.60	1.53
	176	2.38	1.99	1.84	1.73	1.61
THC	160	2.22	2.07	1.99	1.84	1.69
Emissions	150	2.30	2.11	2.07	1.94	1.80
	125	2.38	2.15	2.15	2.03	1.92
(g/bhp-hr)	100	2.53	2.30	2.30	2.15	1.99
	75	2.91	2.61	2.53	2.42	2.30
	50	3.37	3.14	2.99	2.95	2.91

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#### NOTES:

- All data are based on ISO standard conditions of 29.54 inches Hg. (100 kPa) barometric pressure, 77° F (25° C) ambient and induction air temperature, 30% relative humidity (0.3 inches Hg. /1 kPa water vapor pressure), 180° F (82° C) engine jacket water outlet temperature, and standard ignition timing per Note 5 for 11:1 compression ratio.
- All data are average values at the standard conditions and will vary for individual engines and with operating and ambient conditions and with changes to ignition timing or air/fuel ratio. An adequate reserve should be used for cooling system or heat recovery calculations. See also Cooling System Guidelines, S-6699-7, latest version.
- ISO Standard (continuous) power ratings conform to ISO 3046/1, latest version, with a mechanical efficiency of 90% and auxiliary water temperature, Tcra, of 130° F (54.5° C) limited to ± 10° F (± 5.5°C). ISO Standard power rating of 176 BMEP requires Price Book Option Code 1100.
- Fuel standard: dry natural gas, 900 BTU/scf (35.38 MJ/m3 [25, V (0; 101.325)]) saturated lower heating value (SLHV) with a minimum Waukesha Knock Index™ of 91. Refer to S-7884-6, latest version, for the full fuel specification.
- Standard ignition timing is 13° BTDC with J-type 60999T or 60999W spark plugs and 15° BTDC with 4-ground 60999S spark plugs.
- For heat rejection changes due to engine jacket water outlet temperature higher than standard (Note 1), refer to S-7613-3, latest version.
- Total Exhaust Energy includes both recoverable and non-recoverable heat. For a procedure to calculate recoverable heat refer to S-8117-1, latest version.
- Exhaust oxygen concentration set to 7.8% at rated speed and load at standard timing to provide 2 g/bhp-hr or less NOx. This oxygen level is measured at the port located in the exhaust manifold upstream of the turbocharger.
- Low pressure (draw thru) fuel system on the GLD model.
- 10. Reference Engine Ratings and Fuel Consumption curve sheets C-1104-15 and C-1104-17.
- 11. Exhaust flow at nominal 29.54 inches Hg. (100 kPa) atmospheric pressure:

Flow rate (English): ACFM = (Exh. Flow, Ib/hr) x (Exh. Temp. 9F + 4609) 2275

### Attachment D

**Emission Calculations** 

**Engine Emissions** 

**HAP Emissions** 

**Fugitive Leak Emissions** 

**Engine Emissions** 

#### Engine No. 1706

lb CO/hr = 5.14@ 100% load Α В Ib CO/hr = 22.5@ 50% load 40% of year = 3504 Α В 60% of year = 5256tons CO = (lb CO/hr)(hr/yr)(1 ton/2000 lb)=(5.14 lb CO/hr)(3504 hr/yr)(1 ton/2000 lb) =9.01 tons CO =(lb CO/hr)(hr/v(1 ton/2000 lb) =(22.50 lb CO/hr)(5256 hr/yr)(1 ton/2000 lb) =59.13 tons CO/yr = (9.01 tons/yr) + (59.13 tons/yr) =68.14 VOC Emissions: (Based on g/bhp-hr) lb VOC/hr = 0.29@ 100% load В lb VOC/hr = 1.46@ 50% load Α 40% of year = 3504 В 60% of year = 5256tons VOC/yr = (lb VOC/hr)(hr/yr)(1 ton/2000 lb) =(0.29 lb VOC/hr)(3504 hr/yr)(1 ton/2000 lb) =0.51 tons VOC/yr = (ib VOC/hr)(hr/yr)(1 ton/2000 lb) =(1.46 lb VOC/hr)(5256 hr/yr)(1 ton/2000 lb) =3.84 tons VOC/yr = (0.51 tons/yr) + (3.84 tons/yr)

=4.35

NOx Emissions: (Based on Vendor Data) lb NOx/hr = 14.10 tons NOx/yr = (lb NOx/hr)(hr/yr)(1 ton/2000 lb) =(14.10 lb NOx/hr)(8760 hr/yr)(1 ton/2000 lb) =61.76 SO2 Emissions: (Based on gr S/100 scf) lb S/hr = (gr S/100 scf)(MMscf/hr)(1 lb/7000 gr) =(10 gr S/100 scf)(0.1296 MMscf/hr)(1 lb/7000 gr) = 1.85 1b SO2/hr = (1b S/hr)(2 lb SO2/lb S)=(1.85 lb S/hr)(2 lb SO2/lb S) =3.70tons SO2/yr = (lb SO2/hr)(hr/yr)(1 ton/2000 lb) =(3.70 lb SO2/hr)(8760 hr/yr)(1 ton/2000 lb) =16.22 PM Emissions: (Based on lb/MMBtu) ib PM/hr = (ib PM / MMBtu)(MMBtu/hr) =(0.0066 lb/MMBtu/hr)(134.27 MMBtu/hr) =0.89 tons PM/yr = (lb PM/hr)(hr/yr)(1 ton/2000 lb)=(0.89 lb PM/hr)(8760 hr/yr)(1 ton/2000 lb) =3.88

#### Engine No. Gen 03

NOx Emissions: (Based on Vendor Data)

!b NOx/hr = (g/bhp-hr)(bhp)(1 lb/453.59 g) = lb/hr
= (2.1 g/bhp-hr)(585 bhp)(1 lb/453.59 g)
= 2.71

tons NOx/yr = (lb NOx/hr)(hr/yr)(1 ton/2000 lb) = (2.7 lb NOx/hr)(500 hr/yr)(1 ton/2000 lb)= 0.677

CO Emissions: (Based on Vendor Data)

lb CO/hr = (g/bhp-hr)(bhp)(1 lb/453.59 g) = lb/hr
= (1.4 g/bhp-hr)(585 bhp)(1 lb/453.59 g)
= 1.81

tons CO/yr = (lb CO/hr)(hr/yr)(1 ton/2000 lb) =(1.8 lb CO/hr)(500 hr/yr)(1 ton/2000 lb) =0.451

VOC Emissions: (Based on Vendor Data)

lb VOC/hr = (g/bhp-hr)(bhp)(1 lb/453.59 g) = lb/hr
= (0.24 g/bhp-hr)(585 bhp)(1 lb/453.59 g)
= 0.31

tons VOC/yr = (lb VOC/hr)(hr/yr)(1 ton/2000 lb) = (0.31 lb VOC/hr)(500 hr/yr)(1 ton/2000 lb)= 0.08 SO2 Emissions: (Based on FERC Limits)

|b S/hr = (gr S/100 scf)(MMscf/hr)(1 |b/7000 gr)

= (10 gr S/100 scf)(0.0040 MMscf/hr)(1 |b/7000 gr)

= 0.056

lb SO2/hr = (ib S/hr)(2 ib SO2/lb S) = (0.056 lb S/hr)(2 ib SO2/lb S)= 0.11

tons SO2/yr = (lb SO2/hr)(hr/yr)(1 ton/2000 lb) =(0.11 lb SO2/hr)(500 hr/yr)(1 ton/2000 lb) =0.03

PM Emissions: (Based on AP-42 Table 3.2-2, 4/00)

Ib PM/hr = (Ib PM/MMBtu)(MMBtu/hr)

= (0.00999 MMBtu/hr)(4.1 MMBtu/hr)

= 0.0411

tons PM/yr = (lb PM/hr)(hr/yr)(1 ton/2000 lb) =(0.041 lb PM/hr)(500 hr/yr)(1 ton/2000 lb) =0.01

### Modified

Engine No. 1704

**EPN: 004** 

NOx Emissions: (Based on Test Data for Similar Unit)

10 NOx/hr = (g/bhp-hr)(bhp)(1 lb/453.59 g)

=(8.0 g/bhp-hr)(2000 bhp)(1 lb/453.59 g)

= 35.27

tons NOx/yr = (lb NOx/hr)(hr/yr)(1 ton/2000 lb)

=(35.27 tb NOx/hr)(8760 hr/yr)(1 ton/2000 lb)

=154.50

CO Emissions: (Based on Test Data for Similar Unit)

1b CO/hr = (g/bhp-hr)(bhp)(1 lb/453.59 g)

(2.0 g/bhp-hr)(2000 bhp)(1 lb/453.59 g)

8.82

tons CO/yr = (lb CO/hr)(hr/yr)(1 ton/2000 lb)

=(8.82 lb NOx/hr)(8760 hr/yr)(1 ton/2000 lb)

=38.62

VOC Emissions: (Based on Test Data for Similar Unit)

tb VOC/hr = (g/bhp-hr)(bhp)(1 lb/453.59 g)

=(0.1 g/bhp-hr)(2000 bhp)(1 lb/453.59 g)

=0.44

tons VOC/yr = (lb VOC/hr)(hr/yr)(1 ton/2000 lb)

=(0.4 lb NOx/hr)(8760 hr/yr)(1 ton/2000 lb)

=1.93

SO2 Emissions: (Based on FERC Limits)

lb S/hr =(gr S/100 scf)(MMscf/hr)(1 lb/7000 gr)

=(10 gr S/100 scf)(0.0159 MMscf/hr)(1 lb/7000 gr)

=0.23

Ib SO2/hr =(Ib S/hr)(2 Ib SO2/lb S)

=(0.23 lb S/hr)(2 lb SO2/lb S)

=0.45

tons SO2/yr =(lb SO2/hr)(hr/yr)(1 ton/2000 lb)

=(0.45 lb SO2/hr)(8760 hr/yr)(1 ton/2000 lb)

=1.99

PM Emissions: (Based on AP-42 Table 3.2-2, 4/00)

Ib PM/hr =(Ib PM/MMBtu)(MMBtu/hr)

=(0.00999 MMBtu)(16.5 MMBtu/hr)

=0.16

tons PM/yr =(lb PM/hr)(hr/yr)(1 ton/2000 lb)

=(0.16 lb PM/hr)(8760 hr/yr)(1 ton/2000 lb)

=0.72

**HAP Emissions** 

**Turbine 1706 HAP Emission Factors and Emissions** 

Chemical	EF g/hp-hr	tpy	lbs/hour Factor Set
Formaldehyde	0.0146323	2.21631	0.50600685 EPA
Acetaldehyde	0.0003443	0.05215007	0.01190641 EPA
1,3-Butadiene	0.0000019	0.00028779	0.0000657 EPA
Acrolein	0.000034	0.00514988	0.00117577 EPA
Propional	0.000865	0.13101892	0.029913 GRI Field
Propylene Oxide	0.0001248	0.01890308	0.00431577 EPA
n-Nitrosodimethylamine	0.000001	0.00015147	0.00003458 EPA
Benzene	0.0006025	0.09125884	0.02083535 EPA
Toluene	0.0005595	0.08474576	0.01934835 EPA
Ethylbenzene	0.0001033	0.01564654	0.00357227 EPA
Xylenes(m,p,o)	0.0001162	0.01760046	0.00401837 EPA
2,2,4-Trimethylpentane	0.0016053	0.24314991	0.05551368 GRI Field
n-Hexane	0.0015058	0.22807895	0.05207282 GRI Field
Phenol	0.0001101	0.01667651	0.00380742 GRI Field
n-Nitrosomorpholine	0.000001	0.00015147	0.00003458 EPA
Naphthalene	0.0006025	0.09125884	0.02083535 EPA
2-Methylnaphthalene	0.0000013	0.00019691	0.00004496 GRI Field
Biphenyl	0.0003305	0.05005983	0.01142919 GRI Field
Phenanthrene	0.000005	0.00007573	0.00001729 GRI Field
Chrysene	0.000001	0.00015147	0.00003458 GRI Field
Beryllium	0.000001	0.00001515	0.00000346 GRI Field
Phosphorous	0.0000652	0.00987565	0.00225471 GRI Field
Chromium	0.0000056	0.00084821	0.00019366 EPA
Chromium	0.0000082	0.00124203	0.00028357 GRI Field
Manganese	0.0000069	0.00104512	0.00023861 EPA
Nickel	0.0000061	0.00092395	0.00021095 GRI Field
Cobalt	0.0000016	0.00024235	0.00005533 GRI Field
Arsenic	0.0000002	0.00003029	0.00000692 EPA
Selenium	0.0000003	0.00004544	0.00001037 GRI Field
Cadmium	0.0000036	0.00054528	0.00012449 EPA
Mercury	0.0000019	0.00028779	0.0000657 EPA
Lead	0.0000689	0.01043607	0.00238267 EPA
TOTALS	: 0.0217	3.29	0.7508

### Modified Engine 1704 HAP Emission Factors and Emissions

Chemical	EF g/hp-hr	tpy	lbs/hour	Factor Set
Formaldehyde	0.127006	2.45060035	0.5594978	EPA
Methanol	0.0044452	0.08577082	0.01958238	EPA
Acetaldehyde	0.0163293	0.31507636	0.07193524	EPA
Acrolein	0.0074	0.14278414	0.03259912	GRI Literature
Benzene	0.0034927	0.06739219	0.01538634	EPA
Toluene	0.0036287	0.07001633	0.01598546	EPA
Ethylbenzene	0.0003221	0.00621497	0.00141894	EPA
Xylenes(m,p,o)	0.0012701	0.02450678	0.00559516	EPA
2,2,4-Trimethylpentane	0.0013154	0.02538085	0.00579471	EPA
n-Hexane	0.0032205	0.06214004	0.01418722	EPA
Phenol	0.0000907	0.00175007	0.00039956	EPA
Styrene	0.0001724	0.00332648	0.00075947	EPA
Naphthalene	0.0000381	0.00073515	0.00016784	EPA
Biphenyl	0.0007711	0.01487849	0.00339692	EPA
Fluorene	0.0000367	0.00070813	0.00016167	EPA
Ethylene Dibromide	0.0003629	0.00700221	0.00159868	EPA
Vinyl Chloride	0.0001225	0.00236366	0.00053965	EPA
Methylene Chloride	0.000313	0.00603938	0.00137885	EPA
1,1-Dichloroethane	0.0001905	0.00367573	0.00083921	EPA
1,3-Dichloropropene	0.0002177	0.00420056	0.00095903	EPA
Chlorobenzene	0.0002177	0.00420056	0.00095903	EPA
Chloroform	0.0002313	0.00446297	0.00101894	EPA
1,1,2-Trichloroethane	0.0002087	0.0040269	0.00091938	EPA
1,1,2,2-Tetrachloroethane	0.0004082	0.00787628	0.00179824	EPA
Carbon Tetrachloride	0.0002994	0.00577697	0.00131894	EPA
TOTALS:	0.1721	3.32	0.7582	

**Fugitive Leak Emissions** 

Fugitive Emissions Factors					
		Emissions *			
Component	Service	Factor tpy	Factor lb/hr	Factor kg/hr	
Valves	Gas	0.0434606	0.00992251	0.00450085	
Connector	Gas	0.0019316	0.00044100	0.00020004	
Flanges	Gas	0.0037666	0.00085995	0.00039008	
Open-Ended Line	Gas	0.0193158	0.00441000	0.00200038	
Pumps	Gas	0.023179	0.00529201	0.00240046	
Other	Gas	0.0849895	0.01940400	0.00880165	
Valves	Light Oil	0.0241448	0.00551251	0.00250048	
Connector	Light Oil	0.0020282	0.00046306	0.0002100	
Flanges	Light Oil	0.0010624	0.00024256	0.00011002	
Open-Ended Line	Light Oil	0.0135211	0.00308701	0.0014002	
Pumps	Light Oil	0.1255527	0.02866500	0.0130024	
Other	Light Oil	0.0724343	0.01653751	0.0075014	
Valves	Heavy Oil	0.0000811	0.00001852	0.0000084	
Connector	Heavy Oil	0.0000724	0.00001653	0.0000075	
Flanges	Heavy Oil	0.0000038	0.00000087	0.0000003	
Open-Ended Line	Heavy Oil	0.0013521	0.00030870	0.0001400	
Pumps	Heavy Oil	NA	0.00529	Z	
Other	Heavy Oil	0.0002994	0.00006836	0.0000310	

<sup>\*&#</sup>x27;EPA publication EPA-453/R-95-017, November 1995, "Protocol for Equipment Leak EmissionEstimates"

Component	Service	Component	Emissions *	NM/NE	Emissions
		Count	Factor (ton/yr)	Fraction	(ton/yr)
Valves	Gas	246	0.0434606	0.05	0.53
Connector	Gas	0	0.0019316	0.05	0.00
Flanges	Gas	186	0.0037666	0.05	0.04
Open-Ended Line	Gas	63	0.0193158	0.05	0.06
Pumps/compressors	Gas	1	0.023179	0.05	0.00
Other	Gas	0	0.0849895	0.05	0.00
Valves	Light Oil	16	0.0241448	1.00	0.39
Connector	Light Oil	0	0.0020282	1.00	0.00
Flanges	Light Oil	37	0.0010624	1.00	0.04
Open-Ended Line	Light Oil	1	0.0135211	1.00	0.01
Pumps	Light Oil	1	0.1255527	1.00	0.13
Other	Light Oil	0	0.0724343	1.00	0.00
Valves	Heavy Oil	6	0.0000811	1.00	0.00
Connector	Heavy Oil	0	0.0000724	1.00	0.00
Flanges	Heavy Oil	14	0.000038	1.00	0.00
Open-Ended Line	Heavy Oil	2	0.0013521	1.00	0.00
Other	Heavy Oil	0	0.0002994	1.00	0.00
				TOTAL:	1.20

### Attachment E

Test Report for Pre-modified 1704 and Summary Report for Modified 1205

Test Report for Pre-modified 1704

# TEST REPORT On EXHAUST EMISSIONS

### COOPER-BESSEMER LS-8-SG COMPRESSOR ENGINE

COMPRESSOR STATION NO. 17

In MARION COUNTY, FLORIDA

### Prepared for

FLORIDA GAS TRANSMISSION COMPANY

October 2000

Cubix Job No. 6016-10

Prepared by



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### **INTRODUCTION**

Emission testing was conducted on a 2000 brake horsepower (bhp) Cooper-Bessemer Model LS-8-SG compressor engine at Florida Gas Transmission Company's (FGT) Compressor Station No. 17 located near Silver Springs in Marion County, Florida. Oxides of nitrogen (NO<sub>x</sub>), carbon monoxide (CO), total hydrocarbon compounds (THC), and other combustion products were measured in the exhaust of the engine. Volatile organic compounds (VOC) were determined from the product of the stack THC emissions and the non-methane VOC fraction in the fuel gas. Cubix Corporation, Southeast Regional Office conducted these tests on October 3, 2000.

The purpose of this testing was to determine the baseline emissions data from Unit 1704 for potential use in future permitting efforts. Three one-hour test runs were conducted on the Cooper-Bessemer engine documenting engine operational data, emission concentrations, and mass emission rates.

The tests followed the principles of the procedures set forth in the <u>Code of Federal Regulations</u>, Title 40, Part 60, Appendix A, Methods 1, 2, 3a, 4, 7e, 10, 19, and 25a. Table 1 summarizes the background information pertinent to these tests.

This report has been reviewed and is approved for submittal by the following representatives:

Cubix Corporation

Florida Gas Transmission Company

### TABLE 1: **Background Data**

Source Owner:

Florida Gas Transmission Company

601 South Lake Destiny Drive

Maitland, Florida 32751 (407) 875-5865 TEL (407) 875-5896 FAX Attn: Clay Roesler

Email: croesle@enron.com

Test Contractor:

Cubix Corporation, SE Regional Office

3709 SW 42<sup>nd</sup> Avenue, Suite 2 Gainesville, Florida 32608

(352) 378-0332 TEL (352) 378-0354 FAX Attn: Leonard Brenner Email: lenob@gator.net

**Process Description:** 

Four Cooper-Bessemer LS-8-SG Model compressor engines (Units 1701 through 1704) and one Dresser Rand Model 412-KVSRA compressor engine (Unit 1705) are used to compress natural

gas for pipeline transmission.

Test Date(s):

October 3, 2000.

Location:

Compressor Station No. 17 is located on County Road (C.R.) 314, 17 miles northeast of Silver Springs in Marion County, Florida (UTM Coordinates: Zone 17, 418.8 km East and 3240.9 km North; Latitude: 29°17'47" North

Longitude: 81°50'08" West).

**Emission Sampling Points:** 

FDEP Emissions Unit Identification (E.U. ID) No. 0830070-004. Two 2" diameter external threaded NPT sample ports are situated in the horizontal run of exhaust pipe before the silencer. ports are located outside the engine room (see

Appendix A for stack diagram).

### Test Participants:

### Florida Gas Transmission

Donald Hall - Engine Analyst

### AOMcs, LLC.

V. Duane Pierce - Permitting Consultant

### **Cubix Corporation**

Leonard Brenner - Project Manager Roger Paul Osier - Field Technician

### Test Methods:

Environmental Protection Agency (EPA) Method 1 was used to select stack traverse point locations.

EPA Method 2 was used to measure stack gas velocity.

EPA Method 3a was used for determination of oxygen  $(O_2)$  and carbon dioxide  $(CO_2)$  concentrations.

EPA Method 4 was used to determine stack gas moisture content.

Stoichiometric calculations were used for verification moisture content.

EPA Method 7e was used for determination of oxides of nitrogen (NO<sub>x</sub>) concentrations.

EPA Method 10 was used for determination of carbon monoxide (CO) concentrations.

EPA Method 19 was used to calculate stoichiometric volumetric flow based on  $O_2$  and  $CO_2$  "F Factors".

EPA Method 25a was used for determination of total hydrocarbon compound (THC) emissions.

Volatile organic compounds (VOC) were determined from the product of the non-methane organic compound fraction in the natural gas fuel and the THC emissions.

### **SUMMARY OF RESULTS**

FGT owns and operates Compressor Station No. 17 near Silver Springs in Marion County, Florida. At this station four Cooper-Bessemer, Model LS-8-SG, compressor engines along with a Dresser Rand, Model 412-KVSRA, compressor engine are used for compressing natural gas. One of the Cooper-Bessemer engines, FDEP E.U. ID No. 0830070-004, is designated as Unit 1704 by FGT. The emissions from this engine are the subject of this report.

Three one-hour test runs were conducted for each required EPA test method on Unit 1704.  $NO_x$ , CO, THC,  $O_2$ , and  $CO_2$  emissions were continuously monitored during each of these runs. The unit was operated by an automated loading control system within 90% of the 2000 bhp rating set in the FDEP permit (97.3% actual).

Table 2 is a summary of the testing results for Unit 1704. The summary table contains operating data recorded during the test from the engine's control panels (supplied by FGT personnel), ambient conditions, and the measured emissions. The emission rates for  $NO_x$ , CO, and VOC are reported in terms of parts per million by volume (ppmv) on a dry basis, pounds per hour (lbs/hr), and tons per year (tons/yr). Additionally,  $NO_x$ , CO, and VOC are reported in terms of grams per brake horsepower hour (g/bhp-hr).

Pollutant mass emission rates were calculated using the volumetric flow rates determined by EPA Methods 1-4. EPA Methods 1-4 included measurements of stack gas components for molecular weight determination, stack gas moisture, stack gas temperatures, atmospheric pressure, and stack gas static and differential pressures (i.e., velocity). The field data sheets, used for collection of data specific to stack gas moisture and velocity, are in Appendix A. Examples of mass emission rate calculations and other calculations necessary for the presentation of the results of this section are contained in Appendix B. FGT determined and supplied fuel torque horsepower data (used in determination of the emission rate units in g/bhp-hr for run 1704C-1) and analyzer horsepower data (used in determination of the emission rate units in g/bhp-hr on runs 1704C-2 and 1704C-3).

The fuel analysis, used for determination of the fuel heating value and the fuel VOC content, is in Appendix C. Operational data obtained during the testing is presented in Appendix D. Records of quality assurance activities are in Appendix E. Certifications of calibration gases and equipment used to conduct

tests at this facility are in Appendix F. Appendix G contains a copy of the logged data records of the analyzer monitored emission concentrations. The FDEP operating permit is presented in Appendix H for reference purposes.

## **TABLE 2: Summary of Results Unit 1704**

Florida Gas Transmission Compressor Station No. 17

**Baseline Emissions** 

17 miles NE of Silver Springs in Marion Co., Florida Cooper-Bessemer LS-8-SG Compressor Engine

2000 bhp @

Technicians: LJB, RPO		330		
Test Run No.	1704C-1	1704C-2	1704C-3	]
Date	10/3/2000	10/3/2000	10/3/2000	1
Start Time	10:40	13:37	15:02	
Stop Time	11:40	14:37	16:02	
Engine/Compressor Operation		1		Averages
Engine Load (bhp, measured at the compressor)	no data	2035	2029	2032
Fuel Horsepower (bhp, based upon fuel torque)	1898	1975	1961	1945
Engine Speed (rpm)	330	330	329	330
Torque (%, full load = 2000 bhp at 330 rpm)	94.9	98.8	98.2	97.3
Ignition Timing (°BTDC)	24.0	24.0	24.0	24.0
Air Manifold Pressure ("Hg)	9.1	7.7	7.7	8.2
Air Manifold Temperature (°F)	89	86	85	86
Fuel Manifold Pressure (psig)	9.8	9.2	9.1	9.4
Station Suction Pressure (psig)	784	758	752	765
Station Suction Temperature (°F)	75	75	75	75
Station Discharge Pressure (psig)	960	957	952	957
Station Discharge Temperature (°F)	110	114	114	113
Compressor Flow Rate (MMSCFD)	161.7	137.7	135.7	145.0
Loading Step Number	6 to 8	3	3	145.0
Engine Fuel Data (Natural Gas)	0.00	<u> </u>	·	
Fuel Heating Value (Btu/SCF, HHV)	1034.0	1034.0	1034.0	1034.0
Fuel Specific Gravity	0.5841	0.5841	0.5841	0.5841
O <sub>2</sub> "F-factor" (DSCFex/MMBtu @ 0% excess air)	8639	8639	8639	8639
CO <sub>2</sub> "F-factor" (DSCFex/MMBtu @ 0% excess air)	1027	1027	1027	1027
Fuel Flow (SCFH)	13,811	13,463	!	
Heat Input (MMBtu/hr)	14.28	13,403	i 13,373 i 13.83	13,549
Ambient Conditions	14.20	13.92	13.83	14.01
Atmospheric Pressure ( "Hg)	29.94	29.91	29.88	29.91
Temperature (°F): Dry bulb	85.2	91.0	90.0	88.7
(°F): Wet bulb	77.0	76.0	75.0	
` '	0.0176	0.0154	,	76.0
Humidity (lbs moisture/lb air)  Measured Emissions	0.0170	1 0.0134	0.0148	0.0159
NO <sub>x</sub> (ppmv, dry basis)	1502	1570	1665	1570
		223.8	1005	1579
CO (ppmv, dry basis)	226.7		, 220.0	223.5
THC (ppmv, wet basis)	1015	1649	1112	1259
Fuel VOC Fraction (% non-methane)	6.53	6.53	, 6.53	6.53
VOC (ppmv, wet basis) O <sub>2</sub> (% volume, dry basis)	66.3	107.7	72.6	82.2
$CO_2$ (% volume, dry basis)	9.59	9.29	9.37	9.42
F <sub>o</sub> (fuel factor, range = 1.600-1.836 for NG)	6.49	6.64	6.62	6.58
Stack Volumetric Flow Rates	1.74	1.75	1.74	1.74
	2.705.05	0.605.05	0.500.05	
via Pitot Tube (SCFH, dry basis)	2.79E+05	2.62E+05	2.59E+05	2.67E+05
via O <sub>2</sub> "F <sub>d</sub> -factor" (SCFH, dry basis)	2.28E+05	2.16E+05	2.17E+05	2.20E+05
via CO <sub>2</sub> "F <sub>c</sub> -factor" (SCFH, dry basis)	2.26E+05	2.15E+05	2.15E+05	2.19E+05
Calculated Emission Rates (via pitot tube)		10.5	<u> </u>	
NO <sub>x</sub> (lbs/hr)	50.1	49.1	51.5	50.2
CO (lbs/hr)	4.60	4.26	4.14	4.33
VOC (lbs/hr, based on THC emissions and fuel VOC)	0.880	1.34	0.899	1.04
$NO_X$ (tons/yr)	219	215	226	220
CO (tons/yr)	20.1	18.6	18.1	19.0
VOC (tons/yr)	3.85	5.87	3,94	4.56
NO <sub>x</sub> (g/bhp-hr)	12.0	10.9	11.5	11.5
CO (g/bhp-hr)	1.10	0.95	0.93	0.99
VOC (g/bhp-hr)	0.21	0.30	0.20	0.24

### PROCESS DESCRIPTION

FGT, a subsidiary of the ENRON/SONAT affiliate, owns and operates Compressor Station No. 17 in Marion County, Florida. The station uses five natural gas fueled engines to compress natural gas for transport through the FGT pipeline. This section of the report provides a brief description of Unit 1704.

Unit 1704 was manufactured by Cooper-Bessemer, Model LS-8-SG, and is fueled with pipeline grade natural gas. This engine is a lean burning, four-cycle, turbo-charged compressor engine. The State of Florida designates this unit with FDEP E.U. ID No. 0830070-004.

The engine is rated for production of 2000 bhp at full speed, 330 rpm. The operating schedule for this engine is permitted for a continuous 8760 hours per year. The unit has a maximum heat input of 15 MMBtu/hr.

Sample ports meeting the criteria of EPA Method 1 were located in a straight horizontal section of the exhaust pipe approximately 5 feet upstream (~ 3.8 stack diameters) of the silencer and 22 feet downstream (~ 16.8 stack diameters) of the nearest flow disturbance. Access to the stack was made available via temporarily installed scaffolding. The diameter of the exhaust stack was 15.75 inches. Appendix A contains a field sketch of the stack configuration and sample port locations.

FGT personnel obtained operational data from the engine instrument panels. The engine's brake-specific horsepower values were verified using a reciprocating engine analyzer operated by an engine analyst during the testing. Three data sets were recorded during each gaseous sampling test run; the average of this data was recorded in the summary table. Copies of the original data are contained in Appendix D of this report.

### ANALYTICAL TECHNIQUE

The emissions from a Cooper-Bessemer compressor engine were measured to determine the quantity of emissions being emitted to the atmosphere under full load operating conditions. The sampling and analysis procedures used during these tests conformed with those outlined in <u>The Code of Federal Regulations</u>, Title 40, Part 60, Appendix A, Methods 1, 2, 3a, 4, 7e, 10, 19, and 25a. This section of the report describes the analytical techniques and procedures used during the testing.

The test matrix for Unit 1704 consisted of three one-hour test runs following each required test method. The stack gas was analyzed for  $NO_x$ , CO, THC,  $O_2$ , and  $CO_2$  by continuous instrumental monitors. All exhaust gas analyses were performed on a dry basis. Table 3 lists the instruments and detection principles used for these analyses.

Provisions were made to introduce the calibration gases to the instrumental monitors via two paths: 1) directly to the instruments via the sample manifold quick-connects and rotameters, and 2) through the complete sampling system including the sample probe, filter, heat trace, condenser, sample line, manifold, and rotameters. The former method was used for quick, convenient calibration checks. The latter method was used to demonstrate that the sample was not altered due to leakage, reactions, or adsorption within the sampling system (sample system bias check). A NO<sub>x</sub> standard calibration gas was introduced into the NO<sub>x</sub> analyzer directly. Then the response from the NO<sub>x</sub> analyzer was noted as the calibration gas was introduced at the probe. Any difference between the two responses in the instrument was attributed to the bias of the sample system. Following the span gas bias check, a zero gas bias check was performed on the NO<sub>x</sub> analyzer using nitrogen, or another calibration gas as a zero for NO<sub>x</sub>, to check for any zero gas bias of the sample system. In accordance with EPA Method 3a, this span and zero bias check procedure was repeated for the O2 and CO<sub>2</sub> analyzers. This procedure was also used for the CO and THC analyzers (although not required by EPA Methods 10 and 25a).

As shown in Figure 1, a ½-inch diameter stainless steel probe was inserted into the sample port of the stack. The gas sample was continuously pulled through the probe and transported via a 100-foot long, ½-inch diameter heat-traced Teflon® line into the mobile laboratory using a stainless steel/Teflon® diaphragm pump. At the pump exit the pressurized sample was pushed into a

heated sample manifold. From the heated manifold, the sample was partitioned to the hydrocarbon analyzer through heated lines. The bulk of the gas stream then passed to a stainless steel minimum contact condenser to dry the sample stream and into the (dry) sample manifold. From the manifold, the sample was partitioned to the analyzers through glass and stainless steel rotameters for flow control of the sample.

Instrumental monitors were housed in an air-conditioned trailer-mounted mobile laboratory. Gaseous calibration standards were provided in aluminum cylinders with concentrations certified by the vendor. EPA Protocol No. 1 was used to determine the cylinder concentrations where applicable (e.g.,  $NO_x$  calibration gases).

EPA Method 1 was used to determine the velocity traverse point locations. Prior to conducting the tests, a cyclonic flow check was conducted. The stack and ports met the minimum criteria for this method. Pitot tube measurements were made at eight separate traverse points in each stack cross section. The location of the sample ports and the pitot tube traverse point distances for the engine are denoted in the "Circular Stack Sampling Traverse Point Layout" data sheet, see Appendix A.

EPA Method 2 was used for determination of stack gas velocity during each run. A pitot tube and inclined gauge oil manometer were used to measure the differential pressure at each traverse point. Stack temperatures were determined with a K-type thermocouple and digital thermometer.

Stack volumetric flow rates were also determined using EPA Method 19  $O_2$  and  $CO_2$  "F Factors". These "F Factors" and the heating value of the fuel were based on a fuel analysis provided by FGT's in-house laboratory. The fuel analysis and Cubix's fuel calculation table can be found in Appendix C of this report.

The stack gas analyses for  $CO_2$  and  $O_2$  concentrations were performed in accordance with procedures set forth in EPA Method 3a. Instrumental analyses were used in lieu of an Orsat or Fyrite procedure due to the greater accuracy and precision provided by the instruments. The  $CO_2$  analyzer was based on the principle of infrared absorption; and, the  $O_2$  analyzer operated using a current generating micro-fuel cell.

The  $F_0$  calculation of EPA Method 3b (Section 4.1.1) was used to verify that the ratios of  $O_2$  to  $CO_2$  combustion byproducts were within an acceptable range during runs 1704C-1 through 1704C-3. In each case the  $F_0$  fell within the expected values for natural gas.

EPA Method 4 was used to measure the moisture content of the stack gas. A chilled liquid impingement system was used in conjunction with a calibrated dry gas meter to pull a sample greater than 21 scf coincident with each test run. A K-type (chromel-alumel) thermocouple was used in conjunction with a digital thermometer to determine the last impinger temperatures in the chilled water impingement sampling train. This parameter is measured to ensure that the gas stream is cooled to a minimum of 68 degrees Fahrenheit as required by the sampling methodology.

EPA Method 7e procedures were used to determine concentrations of  $NO_x$  (via chemiluminescence).  $NO_x$  mass emission rates were calculated as if the  $NO_x$  emissions were only in the form of  $NO_2$ . This approach corresponds to EPA's convention; however, it tends to overestimate the actual  $NO_x$  mass emission rates since the majority of  $NO_x$  is in the form of NO. NO has less mass per unit volume (i.e., lbs. of emissions per ppmv concentration) than  $NO_2$ .

CO emission concentrations were quantified in accordance with procedures set forth in EPA Method 10. A continuous non-dispersive infrared (NDIR) analyzer was used for this purpose. This reference method analyzer was equipped with a gas correlation filter that removes interference from moisture, CO<sub>2</sub>, and other combustion products.

THC concentrations were quantified during the testing using Method 25a. Stack hydrocarbons were continuously measured throughout each test run using a flame ionization detector (FID). The THC continuous analyzer was calibrated on methane standards in an air matrix. Thus, the results included in this report are presented on a methane basis. Having the calibration standards in an air basis (i.e., 20.9%  $O_2$ ) more closely matches the background matrix of the engine exhaust and helps to reduce the effect of  $O_2$  synergism on flame ionization detectors.

All data from the continuous monitoring instruments were logged into an electronic file in one-minute intervals. A data logger with a computer generated display screen monitored, recorded and averaged the emission concentrations. The program controlling the logging of data was also used to log QA data. See Appendix G of this report for copies of the raw data and Appendix E for the QA data.

Cubix personnel collected ambient absolute pressure, temperature and humidity data. A wet/dry bulb sling psychrometer was used to determine ambient temperature and humidity conditions. A digital barometer was used to measure absolute atmospheric pressure.

FGT personnel also collected key operation data during each of the test runs and supplied it to Cubix. Key operational data collected included a current fuel analysis, engine fuel flow rates, fuel and air manifold pressures and temperatures, suction and discharge pressures, horsepower (fuel torque horsepower for run 1704C-1 and both fuel torque horsepower and analyzer horsepower for runs 1704C-2 and 1704C-3), engine torque values, and engine speeds.

Emission calculations were conducted by a computer spreadsheet as shown in Table 2 of this report. Example calculations were performed manually using a hand-held calculator in order to verify the formulas used in the spreadsheet. Example calculations are in Appendix B of this report.

TABLE 3 **Analytical Instrumentation** 

<u>Parameter</u>	Model and <u>Manufacturer</u>	Common Use Ranges	Sensitivity	Response Time (sec.	<u>Detection Principle</u>
NO <sub>x</sub>	TECO Model 42C	0-10 ppm 0-100 ppm 0-200 ppm 0-500 ppm 0-1,000 ppm	0.1 ppm	1.7	Thermal reduction of NO <sub>2</sub> to NO. Chemiluminescence of the reaction of NO with O <sub>3</sub> . Detection by PMT. Inherently linear within 1% of full scale.
CO	TECO Model 48	0-5,000 ppm 0-1 ppm 0-10 ppm 0-50 ppm 0-100 ppm 0-200 ppm 0-500 ppm	0.1 ppm	60	Infrared absorption, gas filter correlation detector, microprocessor based linearization.
$\overline{\mathrm{CO}_2}$	Servomex 1410 B	0-1000 ppm 0-4% 0-20%	0.02%	30	Infrared absorption, with electronic suppression for analog linearization.
$\overline{\mathrm{O_2}}$	Servomex 1420 B	0-10% 0-25%	0.1%	15	Paramagnetic cell detector, inherently linear.
THC	JUM Model 3-300	0-10, 0-100, 0-1000, 0-10000 0-100,000 ppm	10 ppb	2.0	Flame ionization of hydrocarbons inherently linear within 1% over the range of the analyzer

NOTE: Higher ranges available by sample dilution.
Other ranges available via signal attenuation.

FIGURE 1 INSTRUMENTAL SAMPLE SYSTEM DIAGRAM Vent Sample System  $MO^{x}$ CO Bias Check Line Analyzer Analyzer Flowmeters Calibraton THC Gas Manifold Duct, Flue Analyzer or Stack Sample Manifold Vent Flowmeters SS/Teflon® Sample Pump  $\mathbb{CO}_2$ Analyzer Analyzer Condense Vent Heat Traced Line Sample Stream Dry Gas Sample Line from Source Cubix Corporation Calibration Line Quick Connects 13

### **QUALITY ASSURANCE ACTIVITIES**

A number of quality assurance activities were undertaken before, during, and after this testing project. This section of the report in conjunction with the documentation in Appendix E describes each of those activities.

A multi-point calibration was performed for each instrument in the field prior to the collection of data. The instrument's linearity was checked by first adjusting the instrument's zero and span responses to zero nitrogen and an upscale calibration gas in the range of the expected concentrations. The instrument response was then challenged with other calibration gases of known concentration. The instrument's response was accepted as being linear if the response of the other calibration gases agreed within  $\pm$  2 percent of range from the predicted values. For the THC analyzer, the instrument's response was accepted as being linear if the response of the calibration gases agreed within  $\pm$  5% of each gases' certified concentration. The response of the infrared absorption type CO and CO<sub>2</sub> analyzers was made linear through electronic suppression.

The efficiency of the  $NO_2$  to NO converter in the  $NO_X$  analyzer was checked by monitoring a mixture of NO in  $N_2$  standard gas and zero grade air from a Tedlar® bag. When this bag is mixed and exposed to sunlight, the NO is oxidized to  $NO_2$ . If the  $NO_X$  instrument's converter is 100% efficient, then the total  $NO_X$  response does not decrease as the NO in the bag is converted to  $NO_2$ . The criterion for acceptability is a demonstrable  $NO_X$  converter efficiency greater than 90%; this is demonstrated if the concentration of  $NO_X$  does not decrease by more than 2% of the highest read value over a 30-minute period. The logged data records that demonstrate the converter efficiency test are available in Appendix E. The Instrumental Analysis Quality Assurance Data worksheet, found in Appendix E, also summarizes the results of the converter efficiency test.

System bias checks were performed both before and after the sampling system was used for emissions testing. The sampling system's integrity was tested by comparing the responses of the NO<sub>x</sub> analyzer to a calibration gas (and a zero gas) introduced via two paths as previously described in the *Analytical Techniques* section of this report. This system bias test was performed to assure that no alteration of the sample had occurred during the test due to leakage, reactions, or absorption. Similarly, system bias checks were performed with the

THC, CO,  $O_2$ , and  $CO_2$  analyzers for added assurance of sample system integrity. Examination of the logged data records and Instrumental Analysis Quality Assurance Data worksheet in Appendix E shows that each analyzer's response via both sample paths agreed within  $\pm 5\%$ .

The residence time of the sampling and measurement system was estimated using the pump flow rate and the sampling system volume. The pump's rated flow rate is 0.8 scf per minute (scfm) at 5 psig. The sampling system volume was approximately 0.39 scf. Therefore, the minimum sample residence time was approximately 29 seconds.

Cubix Corporation and instrument vendors conducted interference response tests on the  $NO_x$ , CO, and  $O_2$  analyzers. The sum of the interference responses for  $H_2O$ ,  $C_3H_8$ , CO,  $CO_2$  and  $O_2$  is less than 2 percent of the applicable full-scale span value. The instruments used for the tests meet the performance specifications for EPA Methods 3a, 7e, and 10. The results of the interference tests are available in Appendix E of this report.

The sampling system was leak checked by demonstrating that it could hold a vacuum greater than 10 inches of mercury (Hg) for at least 1 minute with a decline of less than 1 inch Hg. A leak test was conducted after the sample system was set up (i.e., before testing began) and before the system was dismantled (i.e., after testing was completed). This test was conducted to insure that ambient air was not diluting the sampling system. The actual vacuum was greater than 25 inches Hg during these tests with no leakage detected.

As a minimum, before and after each test run, the analyzers were checked for zero and span drift using the calibration gas line attached to the sample probe. This brackets each test run by calibrations and documents the precision of the data just collected. Based on the applicable test method, the criterion for acceptable data is that each instrument drift no more than  $\pm 3\%$  or  $\pm 5\%$  of the full-scale response. Appendix E contains quality assurance tables summarizing all calibration error checks and the zero and span checks that were performed for each test run. These worksheets (as prepared from the logged data records) show that no drift in excess of each gas constituent's calibration requirement was found. The worksheets also contain data used to correct gas concentrations for drift (Method 6c, equation 6c-1).

The control gases used to calibrate the instruments were analyzed and certified by the compressed gas vendors to  $\pm 1\%$  accuracy for each calibration gas. EPA Protocol No. 1 was used, where applicable (i.e., NO<sub>x</sub> gases), to assign the concentration values traceable to the National Institute of Standards and Technology (NIST), Standard Reference Materials (SRM's). The gas calibration

sheets as prepared by the vendor are contained in Appendix F.

The pitot tube tips used during the testing were visually inspected to insure that they met the criteria of EPA Method 2. The pitot tube lines were leak checked in the field in accordance with EPA Method 2 guidelines each time connection to the oil manometer was made.

The dry gas meter used for the moisture train was calibrated prior to testing in accordance with EPA Method 4. A NIST reference instrument, a bell prover, was used for this calibration. Calibration certification documentation of the dry gas meter can be found in Appendix F.

Appendix F also contains calibration data on the barometer and thermometer used during this testing.

Cubix collected and reported the enclosed test data in accordance with the procedures and quality assurance activities described in this test report. Cubix makes no warranty as to the suitability of the test methods. Cubix assumes no liability relating to the interpretation and use of the test data.

# APPENDIX A: FIELD DATA SHEETS

### SIGN IN SHEET

Job Name FGT NO.	PSD Reduction for Station 17	DATE(S): Uctober 3,2000
Job Number Cuby Job!	No. 6016-10	PDEPTITEY PERMIT# 0830070-001-AV
Plant Name/Location FC	ot Compressor Station No. 1	7
Emission Source(s) Unit	45 170341704, two Cooper-B	essemer LS-8-SG Compresor Engine
PARTICIPANTS:	CUBIX CORPORATION	Test Contractor
	Florida Gas Tansmission	Owner/Operator
	Floride Department of Environmental	Regulatory Agency
		<del>-</del>

Name:	Affliation:	Position:	Phone Number	Job Safety Review (Y/N)
Leonard Brenner	Cubix Corportion	Hoject Manager Field	(352)378.0332	Υ
Roger Poul Osier	Cubix Corporation		(352) 378-0332	Y
V. Duane Pierce	AQMes LLC		(281) 373-5365	У
DONALE HALL	FGT	Eng. May 1	850-350-5920	×
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			:	

## Circular Stack Sampling Traverse Point Layout (EPA Method 1)

Date: 10/03/2000

Plant: F67 Compressor Station #17

Source: Unt 1704, 2 Cooper Bessesser 25-9-56

Technician(s): R80, 278

Port + Stack ID: 17.25 in.

Port Extension: 1.5 in.

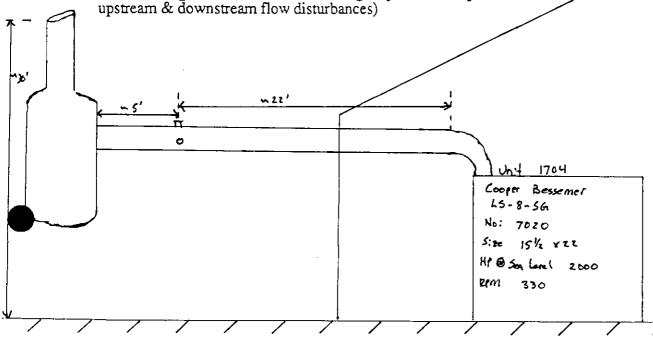
Stack ID: 15.75 in.

Stack Area: 135 ft²

Total Req'd Traverse Pts: 16

No. of Traverse Pts: 8 /port

Stack Diagram (Side View showing major unit components, dimensions and nearest unstream & downstream flow disturbances)



Traverse Point Number	Length Numbe	Distance from Reference			
Number	4	6	8	12	Point (inches)
1	6.7	4.4	3.2	2.1	2. ن
2	25.0	14.6	10.5	6.7	3.15
3	75.0	29.6	19.4	11.8	4.56
4	93.3	70.4	32.3	17.7	6.59
5		85.4	67.7	25.0	12.14
6		95.6	80.6	35.6	14.19
7			89.5	64.4	15.60
8			96.8	75.0	16.75
9				82.3	· · · · · · · · · · · · · · · · · · ·
10				88.2	
11	-			93.3	
12 -				97.9	<del></del>

## EPA Methods 1-4: Velocity, Moisture, Molecular Weight, and Flow Rates

Test Run No.	1704C-1	11010 =	1704C-3
Date	10/3/2000	10/3/2000	10/3/2000
Start Time (Moisture Run Times)	10:42	13:53	15:05
Stop Time (Moisture Run Times)	. 11:24	14:35	15:50
Stack Moisture & Molecular Wt. via EPA Methods	3a & 4		
O <sub>2</sub> (% volume, dry basis)	9.59	9.29	9.37
CO. (% volume, dry basis)	6.49	6.64	6.62
Beginning Meter Reading (ft <sup>3</sup> )	216.244	284.446	319.314
Ending Meter Reading (ft <sup>3</sup> )	252.868	318.946	355.328
Beginning Impingers Weight (g)	2491.7	2541.1	2443.2
Ending Impingers Weight (g)	2586.6	2631.1	2540.2
Dry Gas Meter Factor (K <sub>d</sub> )	0.9700	0.9700	0.9700
Dry Gas Meter Temperature (°F begin)	132	132	132
Dry Gas Meter Temperature (°F end)	138	140	130
Atmospheric Pressure ("Hg, absolute)	29.94	29.91	29.88
Volume of Water Vapor Collected (SCF)	4.475	4.244	4.574
Volume of Air Metered (SCF)	31.533	29.625	31.156
Stack Gas Moisture (% volume)	12.43	12.53	12.80
Dry Gas Fraction	0.8757	0.8747	0.8720
Stack Gas Molecular Wt. (lbs/lb-mole)	28.00	28.00	27.97
Stack Moisture via Stoichiometry			
Combustion Moisture (% volume @ 0% excess air)	18.80	18.80	18.80
Moisture Content (% volume, stoichiometric)	13.01	12.82	12.93
Stack Flow Rate via Pitot Tube			
ΔP #1	2.90	2.92	2.67
ΔP #2	3.02	3.00	2.92
ΔP #3	3.70	3.08	3.03
ΔP #4	3.62	2.91	2.75
ΔP #5	3.63	2.85	2.68
ΔP #6	3.52	3.02	3.04
ΔP #7	3.42	3.04	3.40
ΔP #8	3.40	2.82	2.91
ΔP #9	3.01	2.65	2.92
ΔP #10	3.14	2.74	2.63
ΔP #11	3.14	2.79	2.49
ΔP #12	3.27	2.82	2.53
ΔP #13	3.15	2.72	2.83
ΔP #14	3.27	2.73	3.02
ΔP #15	3.20	2.92	2.72
ΔP #16	2.20	2.41	2.51
Pitot Tube Factor	0.84	0.84	0.84
Sum of Square Root of ΔP's	28.6841	26.9461	26.8249
Number of Traverse Points	16	16	16
Average Square Root of ΔP's	1.79275	1.68413	1.67656
Average Temperature (°F)	851.7	851.8	855.7
Static Pressure ("H <sub>2</sub> O)	7.25	6.7	6.0
Stack Diameter (inches)	15.75	15.75	15.75
Stack Area (ft²)	1.3530	1.3530	1.3530
Stack Velocity (ft/min)	9577	9007	8997
Stack Flow, wet (ACFM)	12957	12187	12173
Average Stack Flow, dry (SCFH)	2.79E+05		
Average Stack Flow, dry (SCFII)	4./9E+U5	2.62E+05	2.59E+05

## MOISTURE AND VELOCITY FIELD DATA SHEETS

Date: October 3,2000	Dry Gas Meter ID: T-5 Equinet	er
Diant/Operator: ECT On an Shim No 17	Dry Gas Meter Factor: 0.9700	(Kd)
Source: Unit 1704 3 Cooper - Ressence LS-8-56	Pitot Tube #/Type: 1010 / 14" 5' 5.5.	5 14pg
Technicians: LJB, RPO	Pitot Tube Factor: 0-84	(Kp)
	Static Pres. +7.25	in.H2O(Pg)
	Average Stack Temp. 851.7 V	°F(Ts)
1631 Kull # 17() 1 C		

Pre-test	2.006 ft.3/min at	Impinger#	Contents	Initial Weight	Final Weight
Leak check	/9" in. Hg Vacuum	1	Di H20	646.6	689.8
Post-test	c. ocort.3/min at	2	Ditho	590.1	615.8
Leak check		3	Empty	511.7	518.4
	<u> </u>	4	Si Ge	743.3	712.6
		5			
		6			
Intel		Totals		2491.7	2586.6

Inited susting 67°F

time! Lest Imp 640F

Moisture Train

## Pitot Tube Traverse/Stack Temp./Angle

` .									
	Initial	Final	Traverse Pt.	ΔP (" H2O)	°F	ß	ΔP (" H2O)	°F	ß
ļ	Turrar	1 11111	• 1	290	856	5	3.01	854	/2
Time:	10:42	11.211	2	3,02	BR	4	3.14	853	10
Ĺ	10.72	11:24	3	3.70	858	4	3./4	851	8
Meter Reading	216.244	0.00	4	3.62	957	5	3.27	848	9
(ft3 or L)	Q1/8 · * / /	252.868	5	3.63	856	6	3,15	846	6
Meter Temp.			6	2.52	955	る	3.27	845	6
(°F)	132°F	138	7	3.42	835	8	3,20	843	6
Samuela Barré	<del></del>		8	3,40	852	10	2.20	840	5
Sample Box #	7-	<u>S</u>	9						
02 %			10						<u> </u>
		$\rightarrow \leftarrow$	11						
CO2 %			12						<u> </u>

Pitot Tube look check

Pre +0.006.2, -0.003.7

Post +0.0039, -0.004.5

## MOISTURE AND VELOCITY FIELD DATA SHEETS

			<del></del>
Date: /c/3/2000		Dry Gas Meter ID: T-5 Equino	te e
Plant/Operator: Fat Compressor	51 #17	Dry Gas Meter Factor: 0.9700	(K4)
Source: Unit 1704 a Cooper Ross	600-1-45-8-50	Pitot Tube #/Type: 4" 5' 55. 5-	TYPE-
Technicians: 700 (JB		Pitot Tube Factor: 0.84	(Kp)
Atm. Pres. 2991	in.Hg(Pb)	Static Pres. +6.7	in.H2O(Pg)
Test Run # 1704-C-2		Average Stack Temp. 85	1.8 ~ °F(Ts)

		ft.3/min at in. Hg Vacuum	Impinger#	Contents	Initial Weight	Final Weight
Leak check	17	m. mg vacuum	1	D: HzO	625.8	695.2
Post-test	0.000	ft.3/min at	2	D. H-20	626.9	639.6
Leak check 19"	in. Hg Vacuum	3	mT	519.8	521.9	
<del></del>			4	5: 6e	768.6	774.4
			5			
			6			
,			Totals		2541,1	2631.7

Last Imp Temps -> 62°F 65°F

## Pitot Tube Traverse/Stack Temp./Angle

862

	62						
	Initial	Final	Traverse Pt.		°F	В	ΔP (" H20
			• 1	292	857	U5	2.45
Time:	13:53	14.2=	2	3,00	858	\_	7,74
}		11.77	3	3.08	857		2.79
Meter Reading	284 411		4	2.91	853		2,82
(ft3 or L)	201.976	446 318.746	5	2.85	848		2.72
Meter Temp.	- 01	111-	6	3.02	842		2.73
(°F)	132%	140	7	3.04	832		292
Sample Box #	7-5	5	8	282	829		2.41
		<u></u>	9				
02 %			10	<u>;                                    </u>			

CO2 % 11 12

Pitot Tule leak check

Pre + 0.0 @ 4.7, - 0.0 @ 6.2

Post + 0,0 @ 3.3., -0.0@5.7

## MOISTURE AND VELOCITY FIELD DATA SHEETS

Date: 10/3/2000	Dry Gas Meter ID: 7-5 Equineter	····
Plant/Operator: F6T Compressor Station #17	Dry Gas Meter Factor: 0.9700	(Kď
Source: Vo. + 1704 + Cooper Bassener - 15-8-56	Pitot Tube #/Type: 1010 /1/4" 5'55	Type S
Technicians: Reo LJB	Pitot Tube Factor: 0.84	(Kp`
Atm. Pres. 29.88 in.Hg(Pb)	Static Pres. +6.0	in.H2O(Pg
Test Run # 1704-C-3	Average Stack Temp. 855.7	°F(Ts
	•	

Pre-test Leak check	0.000 ft.3/min at	Impinger#	Contents	Initial Weight	Final Weight
Leak check	Leak Check 7.5 m. 11g v accum		D:1120	634.6	711.2
Post-test /8", ft.3/min at Leak check in. Hg Vacuum		2	D:H20	639.5	650.8
		3	nit	521.8	523.Z
		4	5:601	647.3	655.0
		5			
		6			
		Totals		2443.2	592540.2

## Moisture Train

## Pitot Tube Traverse/Stack Temp./Angle

	Initial	Final	Traverse Pt.	ΔP (" H2O)		ß	ΔP (" H2O)		ß
1		<del></del>	• 1	2.67	860	NΘ	2.92	863	ทอ
Time:	15:05	15:50	2	2.92	Dol		2.63	864	
ļ		/5.50	3	3,03	198		2.49	862	
Meter Reading	319.314		4	2.75	860		2.53	859	
(ft3 or L)		355.328	5	2.68	859		2.83	855	
Meter Temp.	132°F		6	3.04	857		3.02	848	
(°F)	1	130°F	7	3.40	855		2.72	838	
Sample Box #	7-5		8	2.91	853	4	2.5	836	4
	1,,		9						
02 %			10						
CO2 %		$\sim$	11						
			12						

Pitot Tube leak check

pre- +0.0 = 5.2 , -0.0 = 5.5

post - +0.0 = 3.9 , -0.0 = 6.4

# APPENDIX B: EXAMPLE CALCULATIONS

### **EXAMPLE CALCULATIONS**

### Moisture Content via EPA Method 4

refers to Test Run#1704C-1

```
M_{WC}
             = net impinger weight gain = 2586.6 g - 2491.7 g
                                                                             = 94.9 g
Y
             = dry gas meter correction factor
                                                                             = 0.9700
V_{m}
            = volume metered = (252.868 - 216.244)
                                                                             = 36.624 \text{ ft}^3
Patm
            = atmospheric pressure
                                                                             = 29.94 \text{ "Hg}
P_{met}
            = average meter pressure = P_{atm}
                                                                             = 29.94 \text{ "Hg}
            = average meter temperature = 135 °F + 460 °F
Tmet
                                                                             = 595.0 \, ^{\circ} R
K_2
            = conversion factor, water weight to vapor
                                                                             = 0.04715 \text{ ft}^3/\text{g}
K_3
            = standard temp, pressure (STP) correction factor
                                                                             = 17.64 \, ^{\circ}\text{R} / \, ^{\circ}\text{Hg}
```

$$V_{WC}$$
 = total volume of water vapor collected at STP  
=  $K_2 \times M_{WC}$   
=  $(0.04715 \times 94.9)$   
=  $4.47454 \text{ ft}^3$ 

$$V_{m(std)}$$
 = total volume metered at STP  
= K<sub>3</sub> x Y x V<sub>m</sub> x  $\frac{P_{met}}{T_{met}}$   
= 17.64 x 0.9700 x 36.624 x  $\frac{29.94}{595.0}$   
= 31.53341 ft<sup>3</sup>

$$B_{WS} = \text{moisture content by EPA Method 4}$$

$$= \frac{V_{WC}}{V_{WC} + V_{STP}}$$

$$= \frac{4.47454}{4.47454 + 31.53341}$$

$$B_{ws} = 0.12427$$
= 12.43% moisture

## Moisture Content (via Humidity and Stoichoimetric approx.)

Refers to Test Run #1704C-1

 $H_{amb}$  = ambient humidity (lbs H<sub>2</sub>O/ lb air) = 0.0176 lbs/lb air  $C_{O2}$  = concentration of  $O_2$  = 9.59% (from analyzer)

 $F_{\text{stoi}}$  = stoichiometric moisture @ 0%  $O_2$  = 18.80% vol.

 $F_{hum.}$  = humidity moisture =  $H_{amb} \times 1.61 \times 100$ 

 $F_{com.}$  = combustion moisture (% volume)

 $\mathbf{F}_{\mathbf{W}}$  = moisture fraction by % volume

 $F_W = F_{com.} + F_{hum.}$ 

$$F_W = F_{\text{stoi}} x \left( \frac{20.9 - C_{O2}}{20.9} \right) + (H_{\text{amb}} x 1.61 x 100)$$

$$F_W = 18.80 \text{ x} \left( \frac{20.9 - 9.59}{20.9} \right) + (0.0176 \text{ x } 1.61 \text{ x } 100)$$

 $F_W = 13.01\%$  moisture

### Stack Gas Molecular Weight

Refers to Test Run #1704C-1

 $\begin{array}{lll} MW_{H2O} &=& molecular \ wt \ of \ H_2O &=& 18 \ lb/lb-mole \\ MW_{CO2} &=& molecular \ wt \ of \ CO_2 &=& 44 \ lb/lb-mole \\ MW_{O2} &=& molecular \ wt \ of \ O_2 &=& 32 \ lb/lb-mole \\ MW_{N2} &=& molecular \ wt \ of \ N_2 &=& 28 \ lb/lb-mole \end{array}$ 

 $C_{CO2}$  = concentration of  $CO_2$  = 0.0649 (from analyzer)  $C_{O2}$  = concentration of  $CO_2$  = 0.0959 (from analyzer)  $C_{N2}$  = concentration of  $CO_2$  = 0.0959 (from analyzer) = 1-( $C_{CO2}$ + $C_{O2}$ ) = 0.8392

 $F_d$  = dry gas fraction = 1 -  $B_{ws}$  = 0.87459

MW = molecular weight of stack gas (lb/lb-mole)

= wt. of  $H_2O$  + wt. of  $CO_2$  + wt. of  $O_2$  + wt. of  $N_2$ 

 $= (MW_{H2O} \times B_{ws}) + (F_d \times ((MW_{CO2} \times C_{CO2}) + (MW_{O2} \times C_{O2}) + (MW_{N2} \times C_{N2})))$ 

=  $(18 \times 0.12427) + (0.87573 \times ((44 \times 0.0646) + (32 \times 0.0959) + (28 \times 0.8392)))$ 

MW = 27.99 lb/lb-mole (Differences due to rounding)

## Stack Gas Flow Rate via Pitot Tube, Od

Refers to Test Run #1704C-1, Initial Flow

 $C_p$  = pitot tube coefficient = 0.84  $\Delta P$  = pressure difference in stack as measured (in. H<sub>2</sub>O)

 $\sqrt{\Delta P_{av}}$  = average of square root of  $\Delta P$ 's = 1.79275

 $T_s$  = ave. stack temperature = 851.7 °F + 460 = 1311.7 °R  $P_{atm}$  = site corrected atmospheric pressure = 29.94 "Hg

 $P_g$  = stack static pressure (in. H<sub>2</sub>O) = +7.25 "H<sub>2</sub>O

 $P_s$  = absolute stack pressure

 $= P_{atm} + (Pg/13.6)$  = 30.473 "Hg

 $K_p$  = pitot tube constant =  $85.49 \frac{\text{ft}}{\text{sec}} \left( \frac{\text{(lb/lb-mol)} \text{ (in Hg)}}{\text{(R)} \text{ (in. H2O)}} \right)^{1/2}$ 

$$V_S$$
 = stack velocity (ft/sec)

= 85.49 x C<sub>p</sub> x 
$$\sqrt{\Delta P_{av}}$$
 x  $\sqrt{\frac{T_S}{(P_S \times MW)}}$ 

= 85.49 x 0.84 x 1.79275 x 
$$\sqrt{\frac{1311.7}{(30.473 \times 27.99)}}$$

 $= 159.65395 \text{ ft/sec } \times 60 \text{ sec/min}$ 

= 9,579.237 ft/min (Differences due to rounding)

 $Q_a$  = stack flow rate (ft<sup>3</sup>/min)

= 
$$V \times A$$
, where A= area of stack = 1.35297 ft<sup>2</sup>

$$= 9,579.237 \times 1.35297 = 12,960.42 \text{ ft}^3/\text{min}$$

$$= \frac{Q_a \times K_1 \times P_S}{T_S} \times F_d \times 60$$

$$= \frac{12960.42 \times 17.64 \times 30.473}{1311.7} \times 0.87573 \times 60$$

 $Q_d = 2.79(07) \times 10^5$  DSCFH, Average Flow

## Stack Gas Flow Rates via F Factors

refers to Test Run #1704C-1

Convert fuel flow to heat input:

Hg = heating value of nat. gas = 1034.0 Btu/SCF (gross)

from fuel analysis

F = fuel flow = 13,811 SCFH from fuel meter

H = heat input (MMBtu/hr)

 $= Hg \times F/(1 \times 10^6) = 14.2806 \text{ MMBtu/hr}$ 

Calculate flow rate using O<sub>2</sub> F<sub>d</sub>-factor:

 $C_{O2} = O_2$  concentration in exhaust = 9.59 % by vol, dry

O<sub>2</sub> F<sub>d</sub>-factor = 8639 DSCF of Exhaust/MMBtu of fuel burned @ 0% excess air

Qd<sub>1</sub> = Stack Exhaust Gas Flow Rate via O<sub>2</sub> F<sub>d</sub>-factor

$$Qd_1 = \frac{H \times O_2 F_{d}-factor \times 20.9}{20.9 - C_{O2}}$$

$$Qd_1 = \frac{14.2806 \times 8639 \times 20.9}{20.9 - 9.59}$$

$$Qd_1 = 2.28 \times 10^5 DSCFH$$

Calculate flow rate using CO<sub>2</sub> F<sub>c</sub>-factor:

Using same data as above, except:

 $C_{CO2}$  = Concentration of  $CO_2$  in exhuast = 6.49 % vol, dry

CO<sub>2</sub> F<sub>c</sub>-factor = 1026 DSCF of CO<sub>2</sub>/ MMBtu of fuel burned @ 0% excess air

Qd<sub>2</sub> = Stack Exhaust Gas Flow Rate via CO<sub>2</sub> F<sub>c</sub>-factor

$$Qd_2 = \frac{H \times CO_2 F_c - factor \times 100}{C_{CO2}}$$

$$Qd_2 = \frac{14.2806 \times 1026 \times 100}{6.49}$$

$$Qd_2 = 2.26 \times 10^5 DSCFH$$

### Correction of NO<sub>x</sub> Gas Concentrations

Refers to Test Run #1704C-1

The logged data records were used for continuous instrumental monitor data. Analytical instruments tend to drift in their calibrations over time and with changes in atmospheric conditions. Span and zero gas bias drift checks (calibrations) were conducted prior to and following each test. The results of these calibrations were used to bracket and thus correct the raw gas concentrations into corrected (more accurate) gas concentrations. The calculation used for these correction is 40 CFR 60, Appendix A, Method 6c, Equation 6c-1.

This correction is required for NO<sub>x</sub>, O<sub>2</sub>, and CO<sub>2</sub> exhaust concentrations by each gas constituents respective EPA test method. Cubix also conducts this correction for EPA Methods 10 and 25a, CO and THC monitoring, in order to present more accurate and consistent test results.

U<sub>NOx</sub> = 1468.7 ppmv, uncorrected

C<sub>0</sub> = Average of initial/final zero gas concentrations

= -1.25 ppmv

C<sub>m</sub> = Average of initial/final span gas concentrations

= 3414.95 ppmv

C<sub>ma</sub> = Actual upscale cylinder span gas concentrations

= 3492 ppmv

 $C_{NOx}$  = Effluent  $NO_x$  gas concentration, ppmv corrected

$$= (U_{NOx} - C_0) \times \frac{C_{ma}}{C_m - C_0}$$

$$= (1468.7 - -1.25) \times \frac{3492}{3414.95 - -1.25}$$

 $C_{NOx}$  = 1502.(6) ppmv  $NO_x$ , dry basis corrected

### NOx Mass Emission Rate (lbs/hr)

Refers to Test Run #1704C-1

 $C_{NOx}$  = observed concentration of  $NO_x$  = 1502.6 ppmv

 $MW_{NOx} = 46.01$  lb/lb-mole for nitrogen dioxide

for ideal gas, 385.15 SCF = 1.0 lb/mole

 $Q_d = 2.7907 \times 10^5 \text{ SCFH (from ave. pitot tube volumetric flow)}$ 

 $E_{NOx}$  = mass emission rate of  $NO_x$  in (lb/hr)

$$= C_{NO_x} \times 10^{-6} \times Q_d \times \frac{MW_{NO_x}}{385.15}$$

$$= 1502.6 \times 10^{-6} \times 2.7907 \times 10^{5} \times \frac{46.01}{385.15}$$

 $E_{NOx} = 50.0(9)$  lbs/hr

## CO Mass Emission Rate (lbs/hr)

Refers to Test Run #1704C-1

 $C_{CO}$  = observed concentration of CO = 226.7 ppmv

 $\widetilde{MW}_{CO}$  = 28.01 lb/lb-mole for carbon monoxide using same formula as for  $NO_x$  mass emission rate

 $E_{CO}$  = mass emission rate of CO in (lb/hr)

$$= C_{CO} \times 10^{-6} \times Q_d \times \frac{MW_{CO}}{385.15}$$

= 226.7 x 10<sup>-6</sup> x 2.7907 x 10<sup>5</sup> x 
$$\frac{28.01}{385.15}$$

 $E_{CO} = 4.60 \text{ lbs/hr}$ 

## VOC Mass Emission Rate (lbs/hr)

Refers to Test Run #1704C-1

THC = observed concentration of THC = 1015.2 ppmv as CH4, wet

NMOC = % of fuel non-methane hydrocarbons = 6.53% in fuel as CH<sub>4</sub>

 $B_{WS}$  = stack gas moisture mole fraction = 0.12427

 $MW_{CH_4} = 16.04$  lb/lb-mole for methane

**EVOC** = mass emission rate of VOC in (lb/hr)

= THC x 10<sup>-6</sup> x 
$$\frac{\text{NMOC}}{100}$$
 x  $\frac{1}{1 - \text{Bw s}}$  x Q<sub>d</sub> x  $\frac{\text{MWCH}_4}{385.15}$ 

= 
$$1015.2 \times 10^{-6} \times \frac{6.53}{100} \times \frac{1}{1 - 0.12427} \times 2.7907 \times 10^{5} \times \frac{16.04}{385.15}$$

EVOC = 0.879(8) lbs/hr

## NOx Mass Emission Rate (tons/yr)

Refers to Test Run #1704C-1

 $E_{NO_x}$  = mass emission rate of  $NO_x$  in (lb/hr) = 50.09 lbs/hr Permitted hours per year of unit operation = 8760 hrs/yr

 $NO_x$  yr. = total mass emission rate of  $NO_x$  in (tons/yr)

$$= E_{NOx} \times \frac{8760 \text{ hr}}{\text{yr}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}}$$
$$= 50.09 \times \frac{8760 \text{ hr}}{\text{yr}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}}$$

 $NO_x$  yr. = 219 tons/yr

## CO Mass Emission Rate (tons/yr)

Refers to Test Run #1704C-1

 $E_{CO}$  = mass emission rate of CO in (lb/hr) = 4.60 lbs/hr using same formula as for NO<sub>x</sub> mass emission rate

CO yr. = total mass emission rate of CO in (tons/yr)

= 
$$4.60 \times \frac{8760 \text{ hr}}{\text{yr}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}}$$

CO yr. = 20.1 tons/yr

## VOC Mass Emission Rate (tons/yr)

Refers to Test Run #1704C-1

 $E_{VOC}$  = mass emission rate of VOC in (lb/hr) = 0.8798 lbs/hr using same formula as for NO<sub>x</sub> mass emission rate

**VOC** yr. = total mass emission rate of VOC in (tons/yr)

$$= 0.8798 \times \frac{8760 \text{ hr}}{\text{yr}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}}$$

VOC yr. = 3.85 tons/yr

## NOx Mass Emission Rate (g/bhp•hr)

Refers to Test Run #1704C-1

 $E_{NO_x}$  = mass emission rate of  $NO_x$  in (lb/hr) = 50.09 lbs/hr HP = engine brake-specific horsepower = 1898 bhp

 $NO_X$  em. = total mass emission rate of  $NO_X$  in (g/bhp•hr)

$$= \frac{E_{\text{NO}} \times 454 \text{ g/lb}}{\text{BHP}}$$

$$= \frac{50.09 \text{ lb/hr x } 454 \text{ g/lb}}{1898 \text{ hp}}$$

 $NO_X$  em. = 12.0 g/bhp•hr

## CO Mass Emission Rate (g/bhp•hr)

Refers to Test Run #1704C-1

 $E_{CO}$  = mass emission rate of CO in (lb/hr) = 4.60 lbs/hr using the same formula as for the NO<sub>x</sub> mass emission rate

**CO** em. = total mass emission rate of CO in (g/bhp•hr)

$$= \frac{4.60 \text{ lb/hr x } 454 \text{ g/lb}}{1898}$$

CO em. =  $1.10 \text{ g/bhp} \cdot \text{hr}$ 

## VOC Mass Emission Rate (g/bhp•hr)

Refers to Test Run #1704C-1

 $E_{VOC}$  = mass emission rate of VOC in (lb/hr) = 0.879(8) lbs/hr using the same formula as for the NO<sub>x</sub> mass emission rate

**VOC em.** = total mass emission rate of VOC in (g/bhp•hr)

$$= \frac{0.879 \text{ lb/hr x } 454 \text{ g/lb}}{1898}$$

VOC em. = 0.21 g/bhp•hr

# APPENDIX C: FUEL ANALYSIS AND CALCULATIONS

## Gas Fuel F Factor & Heating Value Calculation

Florida Gas Transmission

Sample ID: Sample Stream Station 16, from Brooker Lab

Time: 16:37

Date: October 3, 2000

## CALCULATION OF DENSITY AND HEATING VALUE @ 60°F and 30 in Hg

				% volume		Component		Gross Heat	Volume
	%	Molecular	Density	x		Gross	Weight	Value	Fract.
Component	Volume	Wt.	(lb/ft3)	Density	weight %	Btu/lb	Fract. Btu	(Btu/SCF)	Btu
Hydrogen		2.016	0.0053	0.0000	0.0000	61100	0.00	325.0	()
Oxygen		32.000	0.0846	0.00000	0.0000	0	0.00	0.0	{}
Nitrogen	0.3373	28.016	0.0744	0.00025	0.5616	0	0.00	0.0	{}
Carbon dioxide	0.7928	44.010	0.1170	0.00093	2.0758	0	0.00	0.0	()
Carbon monoxide		28.010	0.0740	0.00000	0.0000	4347	0.00	322.0	{}
Methane	95.8338	16.041	0.0424	0.04063	90.9349	23879	21714.35	1013.0	970,796
Ethane	2.3463	30.067	0.0803	0.00188	4.2164	22320	941.11	1792.0	42.0457
Ethylene		28.051	0.0746	0.00000	0.0000	21644	0.00	1614.0	()
Propane	0.4037	44.092	0.1196	0.00048	1.0805	21661	234.05	2590.0	10.4558
propylene		42.077	0.1110	0.00000	0.0000	21041	0.00	2336.0	()
Isobutane	0.0977	58.118	0.1582	0.00015	0.3459	21308	73.70	3363.0	3.28565
n-butane	0.0866	58.118	0.1582	0.00014	0.3066	21257	65.17	3370.0	2.91842
Isobutene		56.102	0.1480	0.00000	0.0000	20840	0.00	3068.0	()
Neopentane		72.144	0.1904	0.00000	0.0000	20970	0.00	3986.0	()
lsopentane	0.0305	72.144	0.1904	0.00006	0.1300	21091	27.41	4008.0	1.22244
n-pentane	0.0183	72.144	0.1904	0.00003	0.0780	21052	16.42	4016.0	0.73493
n-hexane +	0.0531	86.169	0.2274	0.00012	0.2702	20940	56.59	4762.0	2.52862
Hydrogen sulfide		34.076	0.0911	0.00000	0.0000	7100	0.00	647.0	()
total	100.00	Average	Density	0.04468	100.0000	Gross Hea	ting Value	Gross Heati	ng Value
		Specific	Gravity	0.58411		Btu/lb	23129	Btu/SCF	1034.0

### CALCULATION OF F FACTORS

Totals

_						Weight Percents			
Component	Mol. Wt.	C Factor	H Factor	% volume	Fract. Wt.	Carbon	Hydrogen	Nitrogen	Oxygen
Hydrogen	2.016	0	1	0.000	0.000		0.000		• • • • • • • • • • • • • • • • • • • •
Oxygen	32.000	0	0	0.000	0.000				0,000
Nitrogen	28.016	0	0	0.337	9.450			0.560	
Carbon dioxide	44.010	0.272273	0	0.793	34.891	0.563			1.502
Carbon monoxide	28.010	0.42587	0	0.000	0.000	0.000			0,000
Methane	16.041	0.75	0.25	95.834	1537.270	68.272	22.757		
Ethane	30.067	0.8	0.2	2.346	70.546	3.342	0.835		
Ethylene	28.051	0.85714	0.14286	0.000	0.000	0.000	0.000		
Propane	44.092	0.81818	0.181818	0.404	17.800	0.862	0.192		
Propene	42.077	0.85714	0.14286	0.000	0.000	0.000	0.000		
Isobutane	58.118	0.82759	0.17247	0.098	5.678	0.278	0.058		
n-butane	58.118	0.82759	0.17247	0.087	5.033	0.247	0.051		
Isobutene	56.102	0.85714	0.14286	0.000	0.000	0.000	0.000		
Neopentane	72.144	0.83333	0.16667	0.000	0.000	0.000	0.000		
Isopentane	72.144	0.83333	0.16667	0.031	2.200	0.109	0.022		
n-pentane	72.144	0.83333	0.16667	0.018	1.320	0.065	0.013		
n-hexane	86.169	0.83721	0.16279	0.053	4.576	0.227	0.044		
Hydrogen sulfide	34.076	0	0.058692	0.000	0.000	0.000	0.000		

	100.000	1688.764	73.964	23.973	0.560	1.502
	CA	LCULATED V	ALUES			
O <sub>2</sub> F Factor (dry)	8639	DSCF of Exh	aust/MM Bru	of Fuel Burnec	@ 0% excess	e nir
O <sub>2</sub> F Factor (wet)	10640			f Fuel Burned		
Moisture F Factor	2000			uel Burned @		
Combust. Moisture	18.80			@ 0% excess		
CO, F Factor	1027	DSCF of CO	2/MM Bru of 1	Fuel Burned @	un NG aveaes sir	
Fuel VOC % (non-C1)	6.53%			der isamed e	On excess an	
Fuel VOC % (non-C1,C2)	2.31%					

APPENDIX D: OPERATIONAL DATA

10:38:58 10/3/00		Freeds		<del></del> 1		
ENGINE SPEED	330	RPM 330		C-la	. <del>-</del>	Averges
IGNITION TIMING OUTPUT	24.0	<u>_°ВТОС</u> Д 4 ° д	MBIENT TEMPERATURE	83	°F —	A
IGNITION TIMING (W/Light)			LOAD STEP NUMBER	6		6 40 8
			STATION SUCTION PRESSURE		PSIG	794 ps
GOVERNOR SETTING	<u> </u>		STATION SUCTION TEMP.	75		75020
AIR MANIFOLD PRESS.	9.0	"Hg 9.1"H4	STATION DISCH. PRESSURE	970		
AIR MANIFOLD TEMP.	88		'STATION DISCH. TEMP.	111		110°F
TURBOCHARGER VIBRATION	0.30	011	COMPRESSOR FLOW RATE	158	MMS	CFD
FUEL STATIC PRESS.		PSIG	PFM FLOW RATE			161.7 mmsch
FUEL DIFF. PRESS.		"H20	"A" COMP. EFFICIENCY	81	<del></del>	
FUEL GAS HEADER PRESS.		PSIG 9.8 ps	B" COMP. EFFICIENCY		%	
	68	of Kop	AVERAGE COMP. EFFICIENCY		%	
FUEL TEMP.			"A" COMP. SUCTION TEMP.	77		
COMPUTER FUEL FLOW SCF	13337	13,711	"B" COMP. SUCTION TEMP.	77		
AGA3 CAL. FUEL FLOW SCF			"A" COMP. DISCHARGE TEM			
CYLINDER #1 TEMP.	958		"B" COMP. DISCHARGE TEM			
CYLINDER #2 TEMP.	949		FUEL TORQUE HP	1927		189881
CYLINDER #3 TEMP.	983		TORQUE	96		
CYLINDER #4 TEMP.	923	°F	GEO. HP	2057		
CYLINDER #6 TEMP.	971		GEO, HP - FUEL TORQUE HP		BHP	
CYLINDER #6 TEMP.	918		CLO. (III - 1 OLE 10 NAOL 1II	130	Ditt	<b>3</b>
CYLINDER #7 TEMP.	896		PFM-2000 BHP	1		
CYLINDER #8 TEMP. MODE	922 AUTO		PFM-2000 TORQUE			]



	4 UINI	OI LIG	TING DATE		
11:15:02 10/3/00			TEST# \70.40		
ENGINE SPEED	330		<u> </u>		° <b>F</b> .
IGNITION TIMING OUTPUT	24.0	*BTDC	AMBIENT TEMPERATURE	83	Г
IGNITION TIMING (w/Light)		i	LOAD STEP NUMBER	6	
			STATION SUCTION PRESSURE	782	PSIG
GOVERNOR SETTING	<u></u>		STATION SUCTION TEMP.	75	°F
AIR MANIFOLD PRESS.	9.1	"Hg	STATION DISCH. PRESSURE	961	PSIG
		°F	STATION DISCH. TEMP.	110	°F
AIR MANIFOLD TEMP.		•	COMPRESSOR FLOW RATE	159	MMSCFD
TURBOCHARGER VIBRATION		IN/SEC	PFM FLOW RATE		
FUEL STATIC PRESS.	74.7		L	·	<del></del>
FUEL DIFF. PRESS.	16.9		"A" COMP. EFFICIENCY	81	%
FUEL GAS HEADER PRESS.		PSIG	"B" COMP. EFFICIENCY	87	%
FUEL TEMP.	68	<b>*F</b>	AVERAGE COMP. EFFICIENCY	84	%
COMPUTER FUEL FLOW SCF	13790		"A" COMP. SUCTION TEMP.	77	°F
AGA3 CAL. FUEL FLOW SCF			"B" COMP. SUCTION TEMP.	77	°F
	949	<del></del>	"A" COMP. DISCHARGE TEMP.		°F
CYLINDER #1 TEMP.	944		"B" COMP. DISCHARGE TEMP.	108	°F
CYLINDER #2 TEMP.	981		FUEL TORQUE HP	1895	BHP
CYLINDER #3 TEMP.	918		TORQUE	95	%
CYLINDER #4 TEMP. CYLINDER #5 TEMP.	964		GEO. HP	2023	BHP
	916		GEO. HP - FUEL TORQUE HP		BHP
CYLINDER #6 TEMP.					
CYLINDER #7 TEMP.	892		PFM-2000 BHP		
CYLINDER #8 TEMP. MODE	917	Г	PFM-2000 TORQUE		
MODE	AUTO		(	L	



ENGINE SPEED	330 RPM	TEST# 1704(	-1c	
IGNITION TIMING OUTPUT	24.0 °BTDC	AMBIENT TEMPERATURE	84	°F
IGN!TION TIMING (w/Light)		LOAD STEP NUMBER	8	DCIO
GOVERNOR SETTING		STATION SUCTION PRESSURE STATION SUCTION TEMP.	787 7 <b>5</b>	PSIG °F
AIR MANIFOLD PRESS.	9.1 "Hg	STATION DISCH. PRESSURE		PSIG
AIR MANIFOLD TEMP.	89 °F	STATION DISCH. TEMP.	108	°F
TURBOCHARGER VIBRATION	0.30 IN/SEC	COMPRESSOR FLOW RATE	168	MMSCFD
FUEL STATIC PRESS.	74.9 PSIG	PFM FLOW RATE		
FUEL DIFF. PRESS.	16.4 "H20	"A" COMP. EFFICIENCY	80	%
FUEL GAS HEADER PRESS.	9.7 PSIG	"B" COMP. EFFICIENCY	87	%
FUEL TEMP.	<b>68</b> °F	AVERAGE COMP. EFFICIENCY	84	%
COMPUTER FUEL FLOW SCF	13647	"A" COMP. SUCTION TEMP.	77	°F
AGA3 CAL. FUEL FLOW SCF		"B" COMP. SUCTION TEMP.	77	°F
CYLINDER #1 TEMP.	944 °F	"A" COMP. DISCHARGE TEMP.		°F °F
CYLINDER #2 TEMP.	939 °F	"B" COMP. DISCHARGE TEMP.	106 1873	ВНР
CYLINDER #3 TEMP.	979 °F	FUEL TORQUE HP TORQUE	94	%
CYLINDER #4 TEMP.	911 °F	GEO. HP		
CYLINDER #6 TEMP.	957 °F	GEO. HP - FUEL TORQUE HP	2028	
CYLINDER #6 TEMP. CYLINDER #7 TEMP.	909 °F 889 °F	GEO. HE - FOEL FOR GOE HE	100	BHP
CYLINDER #7 TEMP.	000	PFM-2000 BHP		Ţ
MODE	911 °F AUTO	PFM-2000 TORQUE		

10/3/00

11:40:48

### Your Company Name Here

## Compressor Cylinder Performance Report

Analyst: Analyzer Name ort Test Lun

17040-2

Station: Silver Springs Compressor Sta.

Date: 10-03-2000

Unit Number: 1704

Asset Number: test-c

Compressor Manufacturer: Cooper Bessemer

Type: C8DAW-14 KM-2

Ambient Temp.: 0°F Atmospheric Pressure (Pb) 14.7 psia K Factor= 1.289 R Factor= 459.6 Tstd= 60.0 Pbstd= 14.696 Zstd= 1.0 Master Rod Length: 38.000" Stroke: 14.000" Load Step: 0

Cylinder		Piston od Dia.		Ps	Comp. Pd Ratio	Ts	Td	Tdt
ID	HE/CE (in.)	(in.) Stage	IHP RPM	(psig)	(psig) (Rc)	( F)	(°F)	(°F)
1HE	HE 18.500	1	498 329	747	938 1.25	77	110	105
1CE	CE 18.500	4.000 1	488 331	748	945 1.26	7 <b>7</b>	110	105
2HE	HE 18.500	1	443 330	749	950 1.26	76	112	105
2CE	CE 18.500	4.000 1	504 330	754	951 1.26	76	112	104
1st Stag	е							
_			Average=	749.56	945.89			
			Minimum=	747.43	937.94			
			Maximum=	753.91	950.89			
		Standard De	eviation=	2.55	5.11			
2nd Stag	е							
			Average=	0.00	0.00			
			Minimum=	9999.99	9999.99			
			Maximum=	-9999.9	-9999.9			
		Standard De	eviation=	0.00	0.00			

Cylinder	Cyl. Volume		ated rance	Theore Clear		EVs	Capacity Flow EVd median Balance	Load
ID	HE/CE (in³)	(%)	(in <sup>3</sup> )	(%)	$(in^3)$	(%)	(%) (immscfd) (Qs/Qd)	(శ)
1HE	HE 3763.2	0.0	0.0				61.51 37.530 1.00	
1CE	CE 3587.3	0.0	0.0				64.74 38.039 1.00	
2HE	HE 3763.2	0.0	0.0				54.65 33.769 1.00	
2CE	CE 3587.3	0.0	0.0	114.7	4115.4	77.79	63.87 38.257 1.03	

#### Compressor Cylinder Performance Report

### Compressor Cylinder Capacity Information

Suction Conditions			Cylinder Discharge Condition			ions	
	Temp		Capacity	Flow	Temp		Capacity
Cylinder	(Ts)	Compressibility	(Qs)	Balance	(Td)	Compressibility	(Qd)
ID	(°F)	(Zs)	(immscfd)	(Qs/Qd)	(°F)	(Zd)	(immscfd)
1HE	77	1.000	37.5074	0.9988	110	1.000	37.5526
1CE	77	1.000	37.9601	0.9958	110	1.000	38.1190
2HE	76	1.000	33.7779	1.0005	112	1.000	33.7602
2CE	76	1.000	38.9069	1.0345	112	1.000	37.6083

1st Stage Total Capacity of Qs = 148.1523Total Capacity of Qd = 147.0401

2nd Stage Total Capacity of Qs = 0.0Total Capacity of Qd = 0.0

### Compressor Cylinder Gas Rod Load Information

Atmospheric Pressure (Pb) = 14.7 psia C = Compression, T = Tension

951

2CE

754

% of Ps/Pd Maximum Maximum Compression to Tension to Cylinder Ps Tension Pd Rod Load Rod Load Allowable Compression (psig) (psig) (lbs.) (lbs.) Rod Load Degree (Atdc) Degree (Atdc) 1HE 747 938 1CE 748 945 2HE 749 950

#### Horsepower and Load Summary

1:34:26 10/3/00 1:34:26	4 UNII OPERATI	NG DATA	
ENGINE SPEED	330 RPM 330		C-2a
IGNITION TIMING OUTPUT	24.0 °BTDC 24.0	AMBIENT TEMPERATURE	87 °F
IGNITION TIMING (W/Light)		LOAD STEP NUMBER	3 3
COVERNOR SETTING		STATION SUCTION PRESSURE	769 PSIG 758
GOVERNOR SETTING		STATION SUCTION TEMP.	<b>75</b> °F 7 <i>5</i> ⁻
AIR MANIFOLD PRESS.	7.7 "Hg 7.7	STATION DISCH. PRESSURE	958 PSIG 9 <i>57</i>
AIR MANIFOLD TEMP.	87 °F 76	STATION DISCH. TEMP.	114 °F 114
TURBOCHARGER VIBRATION	0.31 IN/SEC	COMPRESSOR FLOW RATE	138 MMSCFD 128
FUEL STATIC PRESS.	73.6 PSIG	PFM FLOW RATE	137.7
FUEL DIFF. PRESS.	16.2 "H20	"A" COMP. EFFICIENCY	81 %
FUEL GAS HEADER PRESS.	9.1 PSIG 9-2	"B" COMP. EFFICIENCY	88 %
FUEL TEMP.	69 °F	AVERAGE COMP. EFFICIENCY	85 %
COMPUTER FUEL FLOW SCF	13451 13463	"A" COMP. SUCTION TEMP.	77 °F
AGA3 CAL. FUEL FLOW SCF		"B" COMP. SUCTION TEMP.	76 °F
CYLINDER #1 TEMP.	970 °F	"A" COMP. DISCHARGE TEMP.	110 °F
CYLINDER #2 TEMP.	961 °F	"B" COMP. DISCHARGE TEMP.	112 °F
CYLINDER #3 TEMP.	994 °F	FUEL TORQUE HP	1974 BHP 1975
CYLINDER #4 TEMP.	934 °F	TORQUE	99 %
CYLINDER #5 TEMP.	985 °F	GEO. HP	1920 BHP
CYLINDER #6 TEMP.	932 °F	GEO. HP - FUEL TORQUE HP	-53 BHP
CYLINDER #7 TEMP.	915 °F	PFM-2000 BHP	
CYLINDER #8 TEMP. MODE	937 °F	DEM 2000 TODOUR	
WODE	AUTO	PFM-2000 TORQUE	



ENGINE SPEED	331 R	RPM	TEST# 1704	<b>C</b> -2b	
IGNITION TIMING OUTPUT	24.0 °	BTDC	AMBIENT TEMPERATURE	87	°F
IGNITION TIMING (w/Light)			LOAD STEP NUMBER	3	
GOVERNOR SETTING			STATION SUCTION PRESSURE STATION SUCTION TEMP.	758 75	PSIG °F
AIR MANIFOLD PRESS.	7.7 "	Hg	STATION DISCH. PRESSURE		PSIG
AIR MANIFOLD TEMP.	86 °F	F	STATION DISCH. TEMP.	114	°F
TURBOCHARGER VIBRATION	0.29 IN	N/SEC	COMPRESSOR FLOW RATE	138	MMSCFD
FUEL STATIC PRESS.	73.6 P	PSIG	PFM FLOW RATE		
FUEL DIFF. PRESS.	16.3 "	H20	"A" COMP. EFFICIENCY	81	<u></u> _
FUEL GAS HEADER PRESS.	9.2 P	PSIG	"B" COMP. EFFICIENCY	87	%
FUEL TEMP.	<b>69</b> °F	=	AVERAGE COMP. EFFICIENCY	84	%
COMPUTER FUEL FLOW SCF	13485		"A" COMP. SUCTION TEMP.	77	°F
AGA3 CAL. FUEL FLOW SCF			"B" COMP. SUCTION TEMP.	76	°F
CYLINDER #1 TEMP.	967 °F		"A" COMP. DISCHARGE TEMP.	• • • • •	°F
CYLINDER #2 TEMP.	964 °F		"B" COMP. DISCHARGE TEMP.		°F
CYLINDER #3 TEMP.	993 °F	•	FUEL TORQUE HP	1978	BHP
CYLINDER #4 TEMP.	933 °F		TORQUE	99	%
CYLINDER #6 TEMP.	<b>986</b> °F		GEO, HP	1926	BHP
CYLINDER #6 TEMP.	930 °F		GEO. HP - FUEL TORQUE HP	-53	BHP
CYLINDER #7 TEMP.	919 °F		PFM-2000 BHP		
CYLINDER #8 TEMP. MODE	937 °F	<b>;</b>	DEM AND TOROUT		
	AUTO		PFM-2000 TORQUE	L	



2:03:42

10/3/00

	1/04 UNII	OPEKA	TING DATA		
2:32:48 10/3/00			TEST # 17090	C=2.	
ENGINE SPEED	329 F		1 10 10	- 20	
IGNITION TIMING OUTPUT	24.0	BTDC	AMBIENT TEMPERATURE	87	°F
IGNITION TIMING (w/Light)			LOAD STEP NUMBER	3	
GOVERNOR SETTING			STATION SUCTION PRESSURE		PSIG
GOVERNOR SETTING			STATION SUCTION TEMP.	75	°F
AIR MANIFOLD PRESS.	7.8 '	'Hg	STATION DISCH. PRESSURE	956	PSIG
AIR MANIFOLD TEMP.	85 ∘	F	STATION DISCH. TEMP.	114	
TURBOCHARGER VIBRATIO	N 0.28 I	N/SEC	COMPRESSOR FLOW RATE	137	MMSCFD
FUEL STATIC PRESS.	73.4		PFM FLOW RATE		
FUEL DIFF. PRESS.	15.9 "	'H20	"A" COMP. EFFICIENCY	81	<del>"</del> "
FUEL GAS HEADER PRESS.			"B" COMP. EFFICIENCY	88	
FUEL TEMP.	<b>69</b> °	F	AVERAGE COMP. EFFICIENCY	85	
COMPUTER FUEL FLOW S	CF 13452		"A" COMP. SUCTION TEMP.	77	°F
AGA3 CAL. FUEL FLOW S	CF		"B" COMP. SUCTION TEMP.	76	°F
CYLINDER #1 TEMP.	970 °	F	"A" COMP. DISCHARGE TEMP.	110	°F
CYLINDER #2 TEMP.	963 °		"B" COMP. DISCHARGE TEMP.		
CYLINDER #3 TEMP.	994 %		FUEL TORQUE HP	1974	BHP
CYLINDER #4 TEMP.	933 %		TORQUE	99	%
CYLINDER #5 TEMP.	984 °		GEO. HP	1912	BHP
CYLINDER #6 TEMP.	932 °	F	GEO. HP - FUEL TORQUE HP	-62	BHP
CYLINDER #7 TEMP.	918 °		PFM-2000 BHP		
CYLINDER #8 TEMP.	940 °I	F			

**AUTO** 

PFM-2000 TORQUE



MODE

### Your Company Name Here

### Compressor Cylinder Performance Report

Analyst: Analyzer Name ort Test Run 1704 C-3

Station: Silver Springs Compressor Sta.

Unit Number: 1704

Compressor Manufacturer: Cooper Bessemer

Date: 10-03-2000

Asset Number: test-d

Type: C8DAW-14 KM-2

Ambient Temp.: 0°F

Atmospheric Pressure (Pb) 14.7 psia

K Factor= 1.289 R Factor= 459.6 Tstd= 60.0 Pbstd= 14.696 Zstd= 1.0

Master Rod Length: 38.000" Stroke: 14.000" Load Step: 0

		Piston			Comp.			
Cylinder	Bore R	od Dia.		Ps	Pd Ratio	Ts	Td	Tdt
ID	HE/CE (in.)	(in.) Stage IH	IP RPM	(psig)	(psig) (Rc)	(°F)	(°F)	(°F)
1HE	HE 18.500	1 49	9 331	743	937 1.26	77	110	105
1CE	CE 18.500	4.000 1 48	331	741	940 1.26	77	110	106
2HE	HE 18.500	1 44	11 330	742	942 1.26	76	112	105
2CE	CE 18.500	4.000 1 50	3 3 3 3 0	746	944 1.26	76	112	105
1st Stag	e							
		Ave	rage=	743.22	940.76			
		Min	imum=	741.50	936.83			
		Max	:imum=	746.35	944.41			
		Standard Devia	tion=	1.88	2.74			
2nd Stag	e							
		Ave	rage=	0.00	0.00			
		Min	imum=	9999.99	9999.99			
		Max	:imum=	-9999.9	-9999.9			
		Standard Devia	tion=	0.00	0.00			

	Cyl.	Stated	Theoretical		Capacity Flo	w Rod
Cylinder	Volume	Clearance	Clearance	EVs E	Vd median Balan	ce Load
ID	HE/CE (in <sup>3</sup> )	(%) (in³)	(%) (in³)	(%) (	(%)(immscfd)(Qs/Q	d) (%)
1HE	HE 3763.2	0.0 0.0	147.3 5543.6	71.52 60	0.67 37.104 1.0	0
1CE	CE 3587.3	0.0 0.0	122.7 4402.2	75.66 63	3.87 37.332 1.0	0
2HE	HE 3763.2	0.0 0.0	181.3 6824.1	63.87 54	1.65 33.274 0.9	9
2CE	CE 3587.3	0.0 0.0	113.0 4054.3	77.79 63	3.87 37.912 1.0	3

### Compressor Cylinder Performance Report

### Compressor Cylinder Capacity Information

		Suction Conditi	ons	Cylinder	I	Discharge Condit	ions
	Temp	•	Capacity	Flow	Temp	•	Capacity
Cylinder	(Ts)	Compressibility	(Qs)	Balance	(Td)	Compressibility	(Qd)
ID	(°F)	(Zs)	(immscfd)	(Qs/Qd)	(°F)	(Zd)	(immscfd)
1HE	77	1.000	37.0395	0.9965	110	1.000	37.1703
1CE	77	1.000	37.2557	0.9959	110	1.000	37.4094
2HE	76	1.000	33.0575	0.9870	112	1.000	33.4921
2CE	76	1.000	38.4959	1.0313	112	1.000	37.3283

1st Stage Total Capacity of Qs = 145.8486 Total Capacity of Qd = 145.4001

2nd Stage Total Capacity of Qs = 0.0 Total Capacity of Qd = 0.0

### Compressor Cylinder Gas Rod Load Information

Atmospheric Pressure (Pb) = 14.7 psia C = Compression, T = Tension

% of

			Ps/Pd	Maximum	Maximum (	Compress	sion to	Tensic	n to
Cylinder	Ps	Pd	Rod Load	Rod Load	Allowable	Tens	sion	Compre	ession
ID	(psig)	(psig)	(lbs.)	(lbs.)	Rod Load	Degree	(Atdc)	Degree	(Atdc)
•									
1HE	743	937							
1CE	741	940							
2HE	742	942							
2CE	746	944							

### Horsepower and Load Summary

	94 UNII OPEKAI	ING DATA		
2:59:58 10/3/00		·		
ENGINE SPEED	330 RPM 329	TEST# 17040	C-3a	
IGNITION TIMING OUTPUT	24.0 °BTDC 24	AMBIENT TEMPERATURE	87	°F 85
IGNITION TIMING (W/Light)		LOAD STEP NUMBER	3	.3
		STATION SUCTION PRESSURE	754	PSIG 752
GOVERNOR SETTING		STATION SUCTION TEMP.	75	
AIR MANIFOLD PRESS.	7.7 "Hg <i>7.7</i>	STATION DISCH, PRESSURE	954	PSIG 952
AIR MANIFOLD TEMP.	8 <b>5</b> °F 85	STATION DISCH. TEMP.	114	°F // <del>/</del>
TURBOCHARGER VIBRATION	0.31 IN/SEC	COMPRESSOR FLOW RATE	136	MMSCFD 136
FUEL STATIC PRESS.	73.6 PSIG	PFM FLOW RATE		135.7
FUEL DIFF. PRESS.	16.3 "H20	"A" COMP. EFFICIENCY	81	
FUEL GAS HEADER PRESS.	9.2 PSIG 9 · /	"B" COMP. EFFICIENCY	88	
FUEL TEMP.	69 °F	AVERAGE COMP. EFFICIENCY	85	
COMPUTER FUEL FLOW SCF	13482 (3373	"A" COMP. SUCTION TEMP.	77	
AGA3 CAL. FUEL FLOW SCF		"B" COMP. SUCTION TEMP.	76	°F
	970 °F	"A" COMP. DISCHARGE TEMP.		°F
CYLINDER #1 TEMP. CYLINDER #2 TEMP.	970 °F	"B" COMP. DISCHARGE TEMP.	113	
CYLINDER #2 TEMP.	970 F 994 °F	FUEL TORQUE HP	1979	BHP 1961
CYLINDER #4 TEMP.	935 °F	TORQUE	99	%
CYLINDER #5 TEMP.	985 °F	GEO. HP	1914	ВНР
CYLINDER #6 TEMP.	934 °F	GEO. HP - FUEL TORQUE HP		BHP
CYLINDER #7 TEMP.	922 °F	PFM-2000 BHP		
CYLINDER #8 TEMP.	939 °F	F1 W-2000 BMP		
MODE	AUTO	PFM-2000 TORQUE		



	704 UNI	<u>i Opera</u>	TING DATA		
3:25:59 10/3/00			F		
ENGINE SPEED	329	RPM	TEST# 17040	73b	
IGNITION TIMING OUTPUT	24.0	°BTDC	AMBIENT TEMPERATURE	84	°F
IGNITION TIMING (W/Light)			LOAD STEP NUMBER	3	
GOVERNOR SETTING			STATION SUCTION PRESSURE		PSIG
GOVERNOR SETTING	<u> </u>		STATION SUCTION TEMP.	75	°F
AIR MANIFOLD PRESS.	7.8	"Hg	STATION DISCH. PRESSURE		PSIG
AIR MANIFOLD TEMP.	85	°F	STATION DISCH. TEMP.	115	
TURBOCHARGER VIBRATION	0.31	IN/SEC	COMPRESSOR FLOW RATE	135	MMSCFD
FUEL STATIC PRESS.	73.8	PSIG	PFM FLOW RATE		
FUEL DIFF. PRESS.	15.9	"H20	"A" COMP. EFFICIENCY	82	<del>%</del>
FUEL GAS HEADER PRESS.		<b>PSIG</b>	"B" COMP. EFFICIENCY	88	%
FUEL TEMP.	69	°F	AVERAGE COMP. EFFICIENCY	85	%
COMPUTER FUEL FLOW SC	F 1 <u>3327</u>		"A" COMP. SUCTION TEMP.	77	°F
AGA3 CAL. FUEL FLOW SCI	F		"B" COMP. SUCTION TEMP.	76	°F
CYLINDER #1 TEMP.	963	°F	"A" COMP. DISCHARGE TEMP.		
CYLINDER #2 TEMP.	964	°F	"B" COMP. DISCHARGE TEMP.	113	
CYLINDER #3 TEMP.	993	°F	FUEL TORQUE HP	1953	
CYLINDER #4 TEMP.	927	°F	TORQUE	98	%
CYLINDER #6 TEMP.	935	°F	GEO. HP	1901	BHP
CYLINDER #6 TEMP.	933		GEO. HP - FUEL TORQUE HP	-52	BHP
CYLINDER #7 TEMP.	917		PFM-2000 BHP		
CYLINDER #8 TEMP.	932	°F	DEM 2000 TOPOUE		

**AUTO** 

PFM-2000 TORQUE



MODE

#### **1704 UNIT OPERATING DATA**

ENGINE SPEED	329 RPM	TEST # 1704	<u>(</u> -3c	
IGNITION TIMING OUTPUT	24.0 °BTDC	AMBIENT TEMPERATURE	85	°F
IGNITION TIMING (W/Light)		LOAD STEP NUMBER	3	
		STATION SUCTION PRESSURE	751	PSIG
GOVERNOR SETTING		STATION SUCTION TEMP.	75	°F
AIR MANIFOLD PRESS.	7.7 "Hg	STATION DISCH. PRESSURE	951	PSIG
AIR MANIFOLD TEMP.	84 °F	STATION DISCH. TEMP.	114	°F
TURBOCHARGER VIBRATION	0.30 IN/SEC	COMPRESSOR FLOW RATE	136	MMSCFD
FUEL STATIC PRESS.	73.8 PSIG	PFM FLOW RATE		
FUEL DIFF. PRESS.	15.8 "H20	"A" COMP. EFFICIENCY	81	<del></del> _
FUEL GAS HEADER PRESS.	9.1 PSIG	"B" COMP. EFFICIENCY	88	%
FUEL TEMP.	68 °F	AVERAGE COMP. EFFICIENCY	84	%
COMPUTER FUEL FLOW SCF	: 13311	"A" COMP. SUCTION TEMP.	77	°F
AGA3 CAL. FUEL FLOW SCF		"B" COMP. SUCTION TEMP.	76	°F
CYLINDER #1 TEMP.	965 °F	"A" COMP. DISCHARGE TEMP.		°F
CYLINDER #2 TEMP.	963 °F	"B" COMP. DISCHARGE TEMP.	113	°F
CYLINDER #3 TEMP.	993 °F	FUEL TORQUE HP	1950	BHP
CYLINDER #4 TEMP.	930 °F	TORQUE	98	%
CYLINDER #5 TEMP.	935 °F	GEO. HP	1901	BHP
CYLINDER #6 TEMP.	932 °F	GEO. HP - FUEL TORQUE HP	-49	BHP
CYLINDER #7 TEMP.	920 °F	PFM-2000 BHP		
CYLINDER #8 TEMP.	937 °F			
MODE	AUTO	PFM-2000 TORQUE	[	



10/3/00

4:02:07

# APPENDIX E: QUALITY ASSURANCE ACTIVITIES

Linearity Check	$\overline{NO_X}$	CO	$O_2$	$CO_2$	THC
Analyzer Range (ppmv), O. & CO, in % vol	4000.0	1000.0	25.00	20.00	5000.0
Strip Chart Offset	2.0	5.0	10.0	2.0	5.0
Low Level Certified Value (ppm or % vol)	1209	181.6	3.99	5.04	912
Mid Level Certified Value (ppm or % vol)	1823	447	12.46	9.99	1811
High Level Certified Value (ppm or % vol)	3492	911	20.80	18.01	4162
Zero Target (% Chart)	2.0	5.0	10.0	2.0	5.0
Low Level Target (% Chart)	32.2	23.2	26.0	27.2	23.2
Mid Level Target (% Chart)	47.6	49.7	59.8	52.0	41.2
High Level Target (% Chart)	89.3	96.1	93.2	92.1	88.2
Zero Observed (% Chart)	1.8	5.0	9.8	0.5	5.0
Low Level Observed (% Chart)	32.5	24.6	26.1	26.9	23.5
Mid Level Observed (% Chart)	47.6	51.1	59.5	51.8	41.9
High Level Observed (% Chart)	89.2	96.0	93.2	92.4	88.3
Zero Observed (ppm or % vol)	-9.8	-0.20	-0.04	0.01	1.0
Low Level Observed (ppm or % vol)	1218.1	196.3	4.02	4.98	924.1
Mid Level Observed (ppm or % vol)	1822.3	460.8	12.38	9.96	1846.4
High Level Observed (ppm or % vol)	3488.6	910.0	20.81	18.07	4165.5
% Difference From Zero to Target	-0.2	0.0	-0.2	-1.5	0.0
% Difference From Low to Target	0.2	1.5	0.1	-0.3	0.2
%Difference From Mid to Target	0.0	1.4	-0.3	-0.1	0.7
%Diff. From High to Target	-0.1	-0.1	0.0	0.3	0.1
EPA Allowable % Difference from Target	±2% Span	±2% Span	±2% Span	±2% Span	±2% Span
Test Run 1704C-1	$NO_{X}$	CO	$O_2$	$CO_2$	THC
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in %	4000	1000.0	25.00	20.00	5000
Calibration Gas Certified Value (ppm or %)	3492	447.0	12.46	9.99	1811
Strip Chart Offset	2.0	5.0	10.0	2.0	, 5.0
Target Calibration Gas (Chart %)	89.3	49.7	59.8	: 52.0	41.2
Actual Zero Gas from Direct (Chart %)	1.8	5.0	9.8	0.5	5.0
Actual Calibration Gas from Direct (Chart %)	89.2	51.1	59.5	51.8	41.9
Initial Readings				1	
Zero Gas (chart %)	2.0	4.8	10.1	2.1	5.1
Calibration Gas (chart %)	88.0	51.2	59.4	51.4	41.7
Zero Gas (ppmv)	0.0	-2.5	0.02	0.02	4.9
Calibration Gas (ppmv)	3438.3	461.5	12.35	9.87	1836.7
Final Readings			1		İ
Zero Gas (chart %)	1.9	4.5	10.3	2.4	5.2
Calibration Gas (chart %)	86.8	51.1	59.3	51.8	42.0
Zero Gas (ppmv)	-2.5	-4.9	0.07	0.07	9.8
Calibration Gas (ppmv)	3391.6	461.3	12.33	9.96	1849.1
Bias and Drift Calculations	1	1	1		İ
Zero Bias (% Chart) (Run-Direct Cal) ≤5%	0.2	-0.5	0.4	1.8	0.2
	0.2	0.0			
Calibration Bias (% Chart) ≤5%	-2.4	0.1	-0.2	0.0	0.1
Calibration Bias (% Chart) ≤5%	II .		0.2	0.3	0.1
Calibration Bias (% Chart)≤5%Zero Drift (Chart %) (Run-Run)≤3%	-2.4	0.1			
Calibration Bias (% Chart)≤5%Zero Drift (Chart %) (Run-Run)≤3%	-2.4 -0.1	0.1 -0.2 0.0	0.2 -0.1	0.3 0.5	0.1
Calibration Bias (% Chart) $\leq 5\%$ Zero Drift (Chart %) (Run-Run) $\leq 3\%$ Calibration Drift (Chart %) $\leq 3\%$	-2.4 -0.1 -1.2 38.7	0.1 -0.2 0.0 28.2	0.2	0.3 0.5	0.1 0.2
Calibration Bias (% Chart) $\leq 5\%$ Zero Drift (Chart %) (Run-Run) $\leq 3\%$ Calibration Drift (Chart %) $\leq 3\%$ Run Results	-2.4 -0.1 -1.2	0.1 -0.2 0.0	0.2 -0.1	0.3 0.5	0.1

Test Run 1704C-2	$NO_{X}$	CO	$O_2$	$CO_2$	THC
nalyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in %	4000	1000.0	25.00	20.00	5000
alibration Gas Certified Value (ppm or %)	3492	447.0	12.46	9.99	1811
trip Chart Offset	2.0	5.0	10.0	2.0	5.0
arget Calibration Gas (Chart %)	89.3	49.7	59.8	52.0	41.2
ctual Zero Gas from Direct (Chart %)	1.8	5.0	9.8	0.5	5.0
actual Calibration Gas from Direct (Chart %)	89.2	51.1	59.5	51.8	41.9
nitial Readings		1			
ero Gas (chart %)	1.9	4.5	10.3	2.4	5.2
Calibration Gas (chart %)	86.8	51.1	59.3	51.8	42.0
Zero Gas (ppmv)	-2.5	-4.9	0.07	0.07	9.8
Calibration Gas (ppmv)	3391.6	461.3	12.33	9.96	1849.1
inal Readings		1			
Zero Gas (chart %)	2.4	4.6	10.4	2.1	5.2
Calibration Gas (chart %)	84.5	51.6	59.0	51.8	42.8
Zero Gas (ppmv)	14.7	-3.7	0.11	0.01	9.8
Calibration Gas (ppmv)	3299.7	466.2	12.25	9.95	1890.1
Bias and Drift Calculations				1	
Zero Bias (% Chart) (Run-Direct Cal) ≤5%	0.6	-0.4	0.6	1.5	0.2
Calibration Bias (% Chart) ≤5%	-4.7	0.5	-0.5	-0.1	0.9
Zero Drift (Chart %) (Run-Run) ≤3%	0.4	0.1	0.2	; -0.3	0.0
Calibration Drift (Chart %) $\leq 3\%$	-2.3	0.5	-0.3	-0.1	0.8
Run Results		1		ł	
Raw Results (chart %)	39.7	28.0	46.8	35.2	39.1
Raw Results (ppmv or % vol)	1507.9	230.0	9.19	6.63	1703.0
Corrected Results (ppmv or % vol) from % chart	1570.4	223.8	9.29	6.64	1648.8
Sollected Itts (FF					
Test Run 1704C-3	$\overline{NO}_{X}$	CO	$O_2$	$CO_2$	THO
Test Run 1704C-3	$NO_X$	1000.0	O <sub>2</sub>	CO <sub>2</sub>	5000
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in %				9.99	5000 1811
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %)	4000	1000.0	25.00	9.99 2.0	5000 1811 5.0
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset	4000 3492 2.0	1000.0 447.0	25.00 12.46	9.99 2.0 52.0	5000 1811 5.0 41.2
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %)	4000 3492	1000.0 447.0 5.0	25.00 12.46 10.0	9.99 2.0	5000 1811 5.0 41.2 5.0
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %)	4000 3492 2.0 89.3	1000.0 447.0 5.0 49.7	25.00 12.46 10.0 59.8	9.99 2.0 52.0	5000 1811 5.0 41.2
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %)	4000 3492 2.0 89.3 1.8	1000.0 447.0 5.0 49.7 5.0	25.00 12.46 10.0 59.8 9.8 59.5	9.99 2.0 52.0 0.5 51.8	5000 1811 5.0 41.2 5.0 41.9
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings	4000 3492 2.0 89.3 1.8	1000.0 447.0 5.0 49.7 5.0	25.00 12.46 10.0 59.8 9.8 59.5	9.99 2.0 52.0 0.5 51.8	5000 1811 5.0 41.2 5.0 41.9
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings Zero Gas (chart %)	4000 3492 2.0 89.3 1.8 89.2	1000.0 447.0 5.0 49.7 5.0 51.1	25.00 12.46 10.0 59.8 9.8 59.5	9.99 2.0 52.0 0.5 51.8 2.1 51.8	5000 1811 5.0 41.2 5.0 41.9 5.2 42.8
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings Zero Gas (chart %) Calibration Gas (chart %)	4000 3492 2.0 89.3 1.8 89.2	1000.0 447.0 5.0 49.7 5.0 51.1	25.00 12.46 10.0 59.8 9.8 59.5 10.4 59.0 0.11	9.99 2.0 52.0 0.5 51.8 2.1 51.8 0.01	5000 1811 5.0 41.2 5.0 41.9 5.2 42.8 9.8
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv)	4000 3492 2.0 89.3 1.8 89.2 2.4 84.5	1000.0 447.0 5.0 49.7 5.0 51.1 4.6 51.6	25.00 12.46 10.0 59.8 9.8 59.5	9.99 2.0 52.0 0.5 51.8 2.1 51.8	5000 1811 5.0 41.2 5.0 41.9 5.2 42.8 9.8
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Calibration Gas (ppmv)	4000 3492 2.0 89.3 1.8 89.2 2.4 84.5 14.7	1000.0 447.0 5.0 49.7 5.0 51.1 4.6 51.6 -3.7	25.00 12.46 10.0 59.8 9.8 59.5 10.4 59.0 0.11 12.25	9.99 2.0 52.0 0.5 51.8 2.1 51.8 0.01 9.95	5000 1811 5.0 41.2 5.0 41.9 5.2 42.8 9.8 1890.
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Calibration Gas (ppmv) Final Readings	4000 3492 2.0 89.3 1.8 89.2 2.4 84.5 14.7	1000.0 447.0 5.0 49.7 5.0 51.1 4.6 51.6 -3.7	25.00 12.46 10.0 59.8 9.8 59.5 10.4 59.0 0.11 12.25	9.99 2.0 52.0 0.5 51.8 2.1 51.8 0.01 9.95	5000 1811 5.0 41.2 5.0 41.9 5.2 42.8 9.8 1890.
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Calibration Gas (ppmv) Final Readings Zero Gas (chart %)	2.4 89.2 2.4 84.5 14.7 3299.7	1000.0 447.0 5.0 49.7 5.0 51.1 4.6 51.6 -3.7 466.2	25.00 12.46 10.0 59.8 9.8 59.5 10.4 59.0 0.11 12.25	9.99 2.0 52.0 0.5 51.8 2.1 51.8 0.01 9.95 1 2.3 51.4	5000 1811 5.0 41.2 5.0 41.9 5.2 42.8 9.8 1890.
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Calibration Gas (ppmv) Final Readings Zero Gas (chart %) Calibration Gas (chart %) Calibration Gas (chart %) Calibration Gas (chart %)	2.4 89.2 2.4 84.5 14.7 3299.7	1000.0 447.0 5.0 49.7 5.0 51.1 4.6 51.6 -3.7 466.2	25.00 12.46 10.0 59.8 9.8 59.5 10.4 59.0 0.11 12.25 :	9.99 2.0 52.0 0.5 51.8 2.1 51.8 0.01 9.95 1 2.3 51.4 0.06	5000 1811 5.0 41.2 5.0 41.9 5.2 42.8 9.8 1890.
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Calibration Gas (ppmv) Final Readings Zero Gas (chart %) Calibration Gas (chart %) Calibration Gas (ppmv) Final Readings Zero Gas (chart %) Calibration Gas (chart %)	2.4 84.5 14.7 3299.7	1000.0 447.0 5.0 49.7 5.0 51.1 4.6 51.6 -3.7 466.2 4.6 50.6	25.00 12.46 10.0 59.8 9.8 59.5 10.4 59.0 0.11 12.25	9.99 2.0 52.0 0.5 51.8 2.1 51.8 0.01 9.95 1 2.3 51.4	5000 1811 5.0 41.2 5.0 41.9 5.2 42.8 9.8 1890.
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Calibration Gas (ppmv) Final Readings Zero Gas (chart %) Calibration Gas (ppmv) Calibration Gas (ppmv) Calibration Gas (ppmv) Calibration Gas (ppmv)	2.4 89.3 1.8 89.2 2.4 84.5 14.7 3299.7 2.3 84.3 12.3	1000.0 447.0 5.0 49.7 5.0 51.1 4.6 51.6 -3.7 466.2 4.6 50.6 -3.9	25.00 12.46 10.0 59.8 9.8 59.5 10.4 59.0 0.11 12.25 10.6 59.1 0.16 12.28	9.99 2.0 52.0 0.5 51.8 0.01 9.95 1 2.3 51.4 0.06 9.88	5000 1811 5.0 41.2 5.0 41.9 5.2 42.8 9.8 1890.
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Calibration Gas (ppmv) Final Readings Zero Gas (chart %) Calibration Gas (chart %) Calibration Gas (ppmv) Calibration Gas (ppmv) Calibration Gas (ppmv) Bias and Drift Calculations	2.4 89.2 2.0 89.3 1.8 89.2 2.4 84.5 14.7 3299.7 2.3 84.3 12.3 3290.9	1000.0 447.0 5.0 49.7 5.0 51.1 4.6 51.6 -3.7 466.2 1 4.6 50.6 -3.9 456.4	25.00 12.46 10.0 59.8 9.8 59.5 10.4 59.0 0.11 12.25 10.6 59.1 0.16 12.28	9.99 2.0 52.0 0.5 51.8 2.1 51.8 0.01 9.95 1 2.3 51.4 0.06 9.88	5000 1811 5.0 41.2 5.0 41.9 5.2 42.8 9.8 1890 5.1 4.1 4.9 1802
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Calibration Gas (ppmv) Final Readings Zero Gas (chart %) Calibration Gas (chart %) Calibration Gas (ppmv) Final Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Bias and Drift Calculations Zero Bias (% Chart) (Run-Direct Cal) ≤5%	2.4 89.2 2.0 89.3 1.8 89.2 2.4 84.5 14.7 3299.7 2.3 84.3 12.3 3290.9	1000.0 447.0 5.0 49.7 5.0 51.1 4.6 51.6 -3.7 466.2 466.2 4.6 50.6 -3.9 456.4	25.00 12.46 10.0 59.8 9.8 59.5 10.4 59.0 0.11 12.25 10.6 59.1 0.16 12.28	9.99 2.0 52.0 0.5 51.8 2.1 51.8 0.01 9.95 1 2.3 51.4 0.06 9.88	5000 1811 5.0 41.2 5.0 41.9 5.2 42.8 9.8 1890 41.1 4.9 1802
Analyzer Range (ppm), O₂ & CO₂ in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Calibration Gas (ppmv) Final Readings Zero Gas (chart %) Calibration Gas (chart %) Calibration Gas (chart %) Calibration Gas (ppmv) Bias and Drift Calculations Zero Bias (% Chart) (Run-Direct Cal) ≤5% Calibration Bias (% Chart)	2.4 89.2 2.4 84.5 14.7 3299.7 2.3 84.3 12.3 3290.9 0.6 -4.9 0.1	1000.0 447.0 5.0 49.7 5.0 51.1 4.6 51.6 -3.7 466.2 4.6 50.6 -3.9 456.4	25.00 12.46 10.0 59.8 9.8 59.5 10.4 59.0 0.11 12.25 : 10.6 59.1 0.16 12.28	9.99 2.0 52.0 0.5 51.8 2.1 51.8 0.01 9.95 1 2.3 51.4 0.06 9.88	5000 1811 5.0 41.2 5.0 41.9 5.2 42.8 9.8 1890. 1890. 1802. 0.1 -0.9 -0.1
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Calibration Gas (ppmv) Final Readings Zero Gas (chart %) Calibration Gas (chart %) Calibration Gas (ppmv) Sias and Drift Calculations Zero Bias (% Chart) (Run-Direct Cal) ≤5% Calibration Bias (% Chart) ≤5% Zero Drift (Chart %) (Run-Run)	2.4 89.2 2.0 89.3 1.8 89.2 2.4 84.5 14.7 3299.7 2.3 84.3 12.3 3290.9	1000.0 447.0 5.0 49.7 5.0 51.1 4.6 51.6 -3.7 466.2 466.2 4.6 50.6 -3.9 456.4	25.00 12.46 10.0 59.8 9.8 59.5 10.4 59.0 0.11 12.25 10.6 59.1 0.16 12.28	9.99 2.0 52.0 0.5 51.8 2.1 51.8 0.01 9.95 1 2.3 51.4 0.06 9.88	5000 1811 5.0 41.2 5.0 41.9 5.2 42.8 9.8 1890. 1890. 1802. 0.1 -0.9 -0.1
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Calibration Gas (ppmv) Final Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Calibration Gas (ppmv) Bias and Drift Calculations Zero Bias (% Chart) (Run-Direct Cal) ≤5% Calibration Bias (% Chart) ≤5% Zero Drift (Chart %) (Run-Run) ≤3% Calibration Drift (Chart %)	2.4 89.3 1.8 89.2 2.4 84.5 14.7 3299.7 2.3 84.3 12.3 3290.9 0.6 -4.9 -0.1 -0.2	1000.0 447.0 5.0 49.7 5.0 51.1 4.6 51.6 -3.7 466.2 4.6 50.6 -3.9 456.4 -0.4 -0.4 -0.0 -1.0	25.00 12.46 10.0 59.8 9.8 59.5 10.4 59.0 0.11 12.25 : 10.6 59.1 0.16 12.28	9.99 2.0 52.0 0.5 51.8 2.1 51.8 0.01 9.95 2.3 51.4 0.06 9.88 1.8 -0.4 0.3 -0.3	5000 1811 5.0 41.2 5.0 41.9 5.2 42.8 9.8 1890. 1802. 0.1 -0.9 -0.1 -1.8
Analyzer Range (ppm), O₂ & CO₂ in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Calibration Gas (ppmv) Final Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Calibration Gas (ppmv) Bias and Drift Calculations Zero Bias (% Chart) (Run-Direct Cal) ≤5% Calibration Bias (% Chart) Zero Drift (Chart %) (Run-Run) ≤3% Calibration Drift (Chart %) Run Results	2.4 89.2 2.0 89.3 1.8 89.2 2.4 84.5 14.7 3299.7 2.3 84.3 12.3 3290.9 0.6 -4.9 -0.1 -0.2	1000.0 447.0 5.0 49.7 5.0 51.1 4.6 51.6 -3.7 466.2 1 4.6 50.6 -3.9 456.4 1 -0.4 -0.4 -0.0 -1.0	25.00 12.46 10.0 59.8 9.8 59.5 10.4 59.0 0.11 12.25 : 10.6 59.1 0.16 12.28 10.8 -0.4 0.2 0.1	9.99 2.0 52.0 0.5 51.8  2.1 51.8 0.01 9.95  2.3 51.4 0.06 9.88  1.8 -0.4 0.3 -0.3	5000 1811 5.0 41.2 5.0 41.9 5.2 42.8 9.8 1890. 5.1 41.1 4.9 1802. 0.1 -0.9 -0.1 -1.8
Analyzer Range (ppm), O <sub>2</sub> & CO <sub>2</sub> in % Calibration Gas Certified Value (ppm or %) Strip Chart Offset Target Calibration Gas (Chart %) Actual Zero Gas from Direct (Chart %) Actual Calibration Gas from Direct (Chart %) Initial Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Calibration Gas (ppmv) Final Readings Zero Gas (chart %) Calibration Gas (chart %) Zero Gas (ppmv) Calibration Gas (ppmv) Bias and Drift Calculations Zero Bias (% Chart) (Run-Direct Cal) ≤5% Calibration Bias (% Chart) ≤5% Zero Drift (Chart %) (Run-Run) ≤3% Calibration Drift (Chart %)	2.4 89.3 1.8 89.2 2.4 84.5 14.7 3299.7 2.3 84.3 12.3 3290.9 0.6 -4.9 -0.1 -0.2	1000.0 447.0 5.0 49.7 5.0 51.1 4.6 51.6 -3.7 466.2 1 4.6 50.6 -3.9 456.4 1 -0.4 -0.4 -0.0 -1.0 1 27.5 225.1	25.00 12.46 10.0 59.8 9.8 59.5 10.4 59.0 0.11 12.25 : 10.6 59.1 0.16 12.28	9.99 2.0 52.0 0.5 51.8 2.1 51.8 0.01 9.95 2.3 51.4 0.06 9.88 1.8 -0.4 0.3 -0.3	5000 1811 5.0 41.2 5.0 41.9 5.2 42.8 9.8 1890. 1802. 0.1 -0.9 -0.1 -1.8

# Unit 1704, Logged QA Calibration Records

			$NO_x$	СО	$O_2$	$CO_2$	THC
Run Number	Date	Time	(ppmv)	(ppmv)	(% vol)	(% vol)	(ppmv)
Initial linearity	10/3/2000	9:32:07 AM	4.9	-0.2	-0.04	0.01	15.1
Initial linearity	10/3/2000	9:33:08 AM	2.9	19.6	19.38	23.18	2.9
Initial linearity	10/3/2000	9:34:08 AM	2.0	1001.1	20.62	18.05	1.2
Initial linearity	10/3/2000	9:35:08 AM	2.5	995.5	20.81	18.07	1.0
Initial linearity	10/3/2000	9:36:07 AM	3.9	953.7	20.81	18.07	2.0
Initial linearity	10/3/2000	9:37:07 AM	0.0	916.9	4.00	9.96	1.0
Initial linearity	10/3/2000	9:38:08 AM	0.0	910.0	3.96	9.96	4166.0
Initial linearity	10/3/2000	9:39:08 AM	0.0	812.7	4.02	9.96	4165.5
Initial linearity	10/3/2000	9:40:08 AM	1.5	460.8	12.45	4.98	1849.1
Initial linearity	10/3/2000	9:41:08 AM	0.0	460.8	12.38	4.98	1846.4
Initial linearity	10/3/2000	9:42:08 AM	7.9	196.3	0.04	0.07	924.3
Initial linearity	10/3/2000	9:43:08 AM	-9.8	195.8	0.04	0.03	924.1
Initial linearity	10/3/2000	9:44:08 AM	-8.3	196.3	-0.02	0.06	879.6
Pre Run 1704C-1							
	10/3/2000	9:45:07 AM	-1.0	9.6	12.38	9.79	4.6
	10/3/2000	9:46:08 AM	-8.8	-4.7	12.35	9.87	3.4
Initial Bias Checks	10/3/2000	9:47:08 AM	-5.4	-4.7	12.35	9.87	4.9
Initial Bias Checks		9:48:07 AM	1432.3	-3.9	0.65	0.50	4.9
Initial Bias Checks	10/3/2000	9:49:07 AM	1746.9	-2.2	0.10	0.10	4.9
Initial Bias Checks		9:50:07 AM	1765.5	-3.4	0.13	0.05	4.9
Initial Bias Checks		9:51:08 AM	1765.5	-3.4	1.45	0.05	4.2
Initial Bias Checks		9:52:07 AM	1727.3	-3.9	0.14	0.01	4.9
Initial Bias Checks		9:53:08 AM	1757.7	-2.5	0.04	0.03	4.6
Initial Bias Checks		9:54:08 AM	1825.4	-2.9	0.05	0.02	4.2
Initial Bias Checks	10/3/2000	9:55:07 AM	1825.4	-2.5	0.02	0.02	4.9
Initial Bias Checks	10/3/2000	9:56:08 AM	1821.0	7.1	1.25	0.01	1824.5
Initial Bias Checks	10/3/2000	9:57:08 AM	244.9	1001.1	19.74	0.01	1836.7
Initial Bias Checks	10/3/2000	9:58:08 AM	11.3	998.4	20.58	0.00	468.8
Initial Bias Checks	10/3/2000	9:59:08 AM	-2.0	503.2	20.61	0.01	467.3
Initial Bias Checks	10/3/2000	10:00:08 AM	-4.4	461.5	20.62	0.00	468.0
Pause for emission	s check, reca	librate NOx anal	yzer for hig	gher range.			
Initial linearity	10/3/2000	10:22:43 AM	-9.8	211.0	9.17	6.64	1191.7
Initial linearity	10/3/2000	10:23:44 AM	3428.8	211.0	9.11	6.64	1166.7
Initial linearity	10/3/2000	10:24:43 AM	3488.6	211.5	9.17	6.64	1120.6
Initial linearity	10/3/2000	10:25:43 AM	3315.5	217.9	9.17	6.64	1149.4
Initial linearity	10/3/2000	10:26:43 AM	1823.5	215.9	9.17	6.64	1085.9
Initial linearity	10/3/2000	10:27:43 AM	1822.3	216.4	9.17	6.64	975.6
Initial linearity	10/3/2000	10:28:43 AM	905.0	211.3	9.13	6.64	762.2
Initial linearity	10/3/2000	10:29:43 AM	908.7	63.8	0.85	0.49	7.8
Initial linearity	10/3/2000	10:30:44 AM	1203.4	0.0	-0.05	0.09	4.9
Initial linearity	10/3/2000	10:31:43 AM	1218.1	-3.4	-0.03	0.05	4.9
Initial linearity	10/3/2000	10:32:43 AM	17.2	-2.9	-0.09	0.04	4.6
Initial Bias Check		10:33:44 AM	0.0	-2.7	-0.02	0.02	4.9
Initial Bias Check		10:34:44 AM	1326.2	-2.9	0.10	0.00	4.9
Initial Bias Check		10:35:44 AM	3365.8	-3.7	0.14	0.01	-4.6
Initial Bias Check		10:36:44 AM	3438.3	-3.9	0.09	0.00	-4.6
Initial Bias Check	s 10/3/2000	10:37:43 AM	3438.3	-3.4	0.13	0.00	-4.4

# Unit 1704, Logged QA Calibration Records

			$NO_x$	CO	$O_2$	$CO_2$	THC
Run Number	Date	Time	(ppmv)	(ppmv)	(% vol)	(% vol)	(ppmv)
Post Run 1704C-1/	Pre Run 1704	4C-2					
Bias Checks	10/3/2000	11:41:07 AM	1129.7	241.2	9.67	6.38	1445.3
Bias Checks	10/3/2000	11:42:07 AM	367.2	73.6	12.03	9.62	1036.9
Bias Checks	10/3/2000	11:43:07 AM	43.0	0.0	12.24	9.91	7.6
Bias Checks	10/3/2000	11:44:07 AM	9.8	-4.9	12.35	9.96	8.1
Bias Checks	10/3/2000	11:45:08 AM	2.5	-4.9	12.33	9.96	9.8
Bias Checks	10/3/2000	11:46:07 AM	2711.3	-3.4	0.79	0.59	9.8
Bias Checks	10/3/2000	11:47:07 AM	3344.9	-3.7	0.16	0.10	9.8
Bias Checks	10/3/2000	11:48:08 AM	3390.4	-3.7	0.07	0.07	9.8
Bias Checks	10/3/2000	11:49:07 AM	3391.6	-3.4	0.18	0.03	2076.9
Bias Checks	10/3/2000	11:50:07 AM	440.8	1001.1	19.81	0.01	1849.1
Bias Checks	10/3/2000	11:51:07 AM	24.6	1001.1	20.60	0.00	1800.8
Bias Checks	10/3/2000	11:52:07 AM	0.0	1001.1	20.65	0.00	1773.9
Bias Checks	10/3/2000	11:53:07 AM	0.0	1001.1	20.61	0.02	499.5
Bias Checks	10/3/2000	11:54:07 AM	0.0	490.7	20.67	0.02	519.5
Bias Checks	10/3/2000	11:55:07 AM	-2.5	461.3	20.68	0.02	490.5
Post Run 1704C-2/		4C-3					
Bias Checks	10/3/2000	2:42:08 PM	25.8	-4.9	12.25	9.95	5.6
Bias Checks	10/3/2000	2:43:08 PM	24.6	-4.9	10.31	7.07	9.8
Bias Checks	10/3/2000	2:44:08 PM	2775.2	-4.2	0.35	0.29	9.8
Bias Checks	10/3/2000	2:45:08 PM	3094.4	-4.2	0.13	0.09	9.8
Bias Checks	10/3/2000	2:46:08 PM	3114.1	-3.9	0.16	0.05	9.8
Bias Checks	10/3/2000	2:47:08 PM	3119.0	-3.2	0.24	0.02	9.8
Bias Checks	10/3/2000	2:48:08 PM	2035.9	-3.9	1.64	0.00	14.4
Bias Checks	10/3/2000	2:49:09 PM	3072.3	-2.9	0.11	0.04	9.8
Bias Checks	10/3/2000	2:50:08 PM	3284.8	-4.9	0.13	0.00	9.8
Bias Checks	10/3/2000	2:51:08 PM	3299.7	-3.7	0.11	0.01	9.8
Bias Checks	10/3/2000	2:52:08 PM	835.0	1001.1	18.44	0.00	2643.6
Bias Checks	10/3/2000	2:53:08 PM	72.4	1001.1	20.52	0.00	1884.8
Bias Checks	10/3/2000	2:54:08 PM	23.3	1001.1	20.59	0.00	1890.1
Bias Checks	10/3/2000	2:55:08 PM	16.0	1001.1	20.60	0.00	1850.3
Bias Checks	10/3/2000	2:56:08 PM	17.2	868.6	20.56	0.01	483.6
Bias Checks	10/3/2000	2:57:09 PM	14.7	466.2	20.54	0.00	493.2
Post Run 1704C-3							
Final Bias Checks		4:08:51 PM	41.8	-2.9	12.28	9.88	5.4
Final Bias Checks		4:09:50 PM	2471.9	-3.7	0.87	0.59	5.6
Final Bias Checks		4:10:51 PM	3241.8	-3.4	0.22	0.10	5.4
Final Bias Checks		4:11:51 PM	3292.1	-3.9	0.10	0.08	5.6
Final Bias Checks		4:12:50 PM	3290.9	-3.9	0.16	0.06	4.9
Final Bias Checks		4:13:51 PM	3190.2	422.0	0.08	0.00	1645.0
Final Bias Checks		4:14:50 PM	120.3	1001.1	-0.07	0.02	1670.2
Final Bias Checks		4:15:50 PM	27.0	1001.1	-0.07	0.00	1677.5
Final Bias Checks		4:16:50 PM	24.6	1001.1	-0.03	0.01	1798.6
Final Bias Checks		4:17:51 PM	16.0	1001.1	0.02	0.00	1802.5
Final Bias Checks		4:18:50 PM	18.4	1001.1	0.00	0.02	446.8
Final Bias Checks		4:19:50 PM	13.5	528.8	0.03	0.01	449.2
Final Bias Checks		4:20:50 PM	14.7	460.3	-0.05	0.01	452.1
Final Bias Checks		4:21:51 PM	12.3	456.4	0.02	0.01	426.3

# Instrumental Analyses Quality Assurance Data

Date:

October 3, 2000

Company:

Florida Gas Transmission Company

Facility:

Compressor Station No. 17

Source ID:

Unit 1704, a Cooper-Bessemer LS-8-SG Compressor Engine

Location:

Silver Springs, Marion County, Florida

**Technicians:** 

LJB, RPO

# NO<sub>x</sub> Analyzer: NO<sub>2</sub> to NO Converter Efficiency Test

NO<sub>x</sub> Calibration Gas: 1209 ppmv

Diluent Gas: Air

Date: 10/3/2000

_	NO <sub>x</sub> conc. (ppmv)	% Decrease from Highest conc.	NO conc. (ppmv)
Highest NO <sub>x</sub> Concentration:	431.3		
Initial Concentration:	423.0	1.92	na
10 minute Concentration:	427.9	0.79	228
20 minute Concentration:	431.1	0.05	218
30 minute Concentration:	424.8	1.51	208
Lowest NO <sub>x</sub> Concentration:	423.0	1.92	
Converter efficiency criteria is le	ess than 2% de	crease from highest read	value.

Instrumental Sample System Leak Checks								
Run Vacuum Leak Rate Date Number (inches Hg) (inches Hg/min) Pass								
10/3/2000	pre 1704C-1	27.5	0.3	yes				
10/3/2000 post 1704C-3 27.6 0.1 yes								
Leak check crite	Leak check criteria less than 1.0" Hg Vac. Decline at gretar than 15.0" Hg Vac.							

# NOx Converter Efficiency Test Unit 1704

Run Number	MODE	Date	Time	NOx
-		•	•	(ppmv)
START NOx Converter	Total NOx	10/3/2000	8:43:06 AM	423.0
NOx Converter	Total NOx	10/3/2000	8:44:06 AM	423.1
NOx Converter	Total NOx	10/3/2000	8:45:06 AM	423.5
NOx Converter	Total NOx	10/3/2000	8:46:06 AM	423.0
NOx Converter	Total NOx	10/3/2000	8:47:06 AM	424.5
NOx Converter	Total NOx	10/3/2000	8:48:07 AM	423.0
NOx Converter	Total NOx	10/3/2000	8:49:06 AM	423.5
NOx Converter	Total NOx	10/3/2000	8:50:06 AM	426.4
NOx Converter	Total NOx	10/3/2000	8:51:06 AM	424.5
NOx Converter	Total NOx	10/3/2000	8:5 <u>2</u> .06 AM	423.5
NOx Converter	Total NOx	10/3/2000	8:53:07 AM	427.9
NOx Converter	Total NOx	10/3/2000	8:54:07 AM	428.4
NOx Converter	Total NOx	10/3/2000	8:55:06 AM	429.9
NOx Converter	Total NOx	10/3/2000	8:56:07 AM	428.9
NOx Converter	Total NOx	10/3/2000	8:57:07 AM	428.4
NOx Converter	Total NOx	10/3/2000	8:58:06 AM	429.4
NOx Converter	Total NOx	10/3/2000	8:59:06 AM	428.9
NOx Converter	Total NOx	10/3/2000	9:00:07 AM	427.9
NOx Converter	Total NOx	10/3/2000	9:01:06 AM	428.4
NOx Converter	Total NOx	10/3/2000	9:02:06 AM	431.3
NOx Converter	Total NOx	10/3/2000	9:03:06 AM	431.1
NOx Converter	Total NOx	10/3/2000	9:04:06 AM	430.5
NOx Converter	Total NOx	10/3/2000	9:05:06 AM	430.7
NÖx Converter	Total NOx	10/3/2000	9:06:06 AM	429.8
NOx Converter	Total NOx	10/3/2000	9:07:06 AM	430.1
NOx Converter	Total NOx	10/3/2000	9:08:06 AM	429.4
NOx Converter	Total NOx	10/3/2000	9:09:06 AM	429.4
NOx Converter	Total NOx	10/3/2000	9:10:06 AM	427.6
NOx Converter	Total NOx	10/3/2000	9:11:06 AM	425.3
NOx Converter	Total NOx	10/3/2000	9:12:06 AM	424.1
END NOx Converter	Total NOx	10/3/2000	9:13:06 AM	424.8

# T-5 Interference Response Analyzer Checks

# Interference Response Checks

(Frequency: Prior to initial use of sampling system or after alteration or modification.)

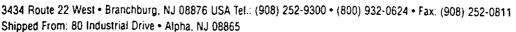
Test Date: 11/1/1999

Technician:

IUI.

Analyzer	Make	Model	Serial Number	Detection Method	thod
NO <sub>x</sub> Analyzer	TECO	42C	42 CEL-64933-345	Chemiluminescence with Ozone	with Ozone
CO Analyzer	TECO	48H	48-42825-268	Infrared Absorption/GFC Detector	FC Detector
O <sub>2</sub> Analyzer	Servomex	1400	1420/B701/591	Paramagnetic	ic
CO <sub>2</sub> Analyzer	Servomex	1400	1410/B570	Infrared Absorption/Solid State Detector	1 State Detector
Interference Test Gases		Analyzer Re	sponse (ppmv or	Analyzer Response (ppmv or % as applicable)	
Type Gas	Conc.	$NO_{x}$	00	$\mathbf{O}_2$	CO <sub>2</sub>
NO <sub>x</sub> in N <sub>2</sub>	4042 ppmv		0.30 ppmv	0.15%	0.00%
CO/CH <sub>4</sub> in Air		0.00 ppmv			0.00%
Moisture	4%	0.00 ppmv	0.00 ppmv	0.00%	0.00%
$SO_2$ in $N_2$	4400	1.70 ppmv	0.00 ppmv	0.00%	0.00%
$O_2$ in $N_2$	15%	0.00 ppmv	0.10 ppmv		0.00%
$O_2/CO_2$ in $N_2$	O <sub>2</sub> /CO <sub>2</sub> in N <sub>2</sub> 12.63%/10.06% 0.00 ppmv	0.00 ppmv	0.50 ppmv	Mark Company	







C	F	P	T	IF	C	Δ	TI	F,	$\cap$	F	Δ	N	Δ	1)	<b>YS</b>	1	ς
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**EPA PROTOCOL MIXTURE** 

PROCEDURE #: G1

CUSTOMER:

Raxles

CYLINDER #:

CC98853

SGI ORDER #:

141291

CYLINDER PRES: 2000 PSIG

ITEM#:

**CGA OUTLET:** 

660

P.O.#:

G01242

**CERTIFICATION DATE: 4/6/99 EXPIRATION DATE:** 

4/6/2001

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Nitric Oxide	3/30/99 4/6/99	901.5 ppm 901.7 ppm	902 ppm	+/- 1%
NOx	·		902 ppm	Reference Value Only
			•	
				•

**BALANCE** 

Nitrogen

PREVIOUS CERTIFICATION DATES: None

#### **REFERENCE STANDARDS**

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Nitric Oxide	NTRM-81687	CC57126	1009 ppm

#### INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL#	DETECTOR	CALIBRATION DATE(S)
Nitric Oxide	Teco 10	10AR-34979-249	Cheml	3/15/99
		:		

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST:	261.		
<del></del>	EDED	DIVIII	٨



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**EPA PROTOCOL MIXTURE** 

PROCEDURE #: G1

CUSTOMER:

Quadline C/O Cubix Corporation

CYLINDER #:

CC94430

SGI ORDER #:

147054

CYLINDER PRES: 2000 PSIG

ITEM#:

CGA OUTLET:

660

P.O.#:

G-1273

**CERTIFICATION DATE: 10/06/99** 

EXPIRATION DATE: 10/06/2001

#### **CERTIFICATION HISTORY**

	DATE OF	MEAN	CERTIFIED	ANALYTICAL
COMPONENT	ASSAY	CONCENTRATION	CONCENTRATION	ACCURACY
Nitric Oxide	9/23/98	1209 ppm	1208 ppm	+/- 1%
	10/06/99	1208 ppm		
NOx			1209 ppm	Reference Value Only
				•

BALANCE

Nitrogen

PREVIOUS CERTIFICATION DATES: None

#### REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Nitric Oxide	GMIS-1	CC55762	2976 ppm

#### INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL#	DETECTOR	CALIBRATION
				DATE(S)
Nitric Oxide	Teco 10	10AR-34979-249	Cheml	9/15/99

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

DATE: 10/06/99



# EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

ORDER NO. 016819

**CUSTOMER** 

CUBIX INTERNATIONAL 9225 HIGHWAY 183 S AUSTIN, TX 76747 CYLINDER NO:

XC003493B

**EXPIRATION DATE:** 

05/19/01

**CERTIFICATION DATE:** 

05/19/99

CYLINDER PRESSURE:

2000 psig

PURCHASE ORDER: CUBIX C9006

	CERTIFIED	TOTAL RELATIVE		CALIBRATION	<b>STANDARDS</b>	SUSED IN ASSA	1	
COMPONENT	CONCENTRATION	UNCERTAINTY		TYPE	LOT ID	CYLINDER	CONC.	CAS NO.
Nitric Oxide Total Oxides of Nitrogen Nitrogen	1816 ppm 1823 ppm Balance Gas <sup>2</sup> "	+/- 1 % +/- 1 %	:	NTRM 2630	82630	CC-12776	1414 ppm	10102-43-9 10102-43-9 7727-37-9

#### **ANALYZER READINGS**

ASSAY LABORATORY: Port Allen

TEST NUMBER: 105457

ASSAT ENDOTOTION: 1 OIL MILL

COMPONENT:

Nitric Oxide

Analyzer: THERMO ENVIRONMENTAL Model 42C Chemiluminescence S/N 42CHL-57881-313

Last Multipoint Calibration: 05/10/99

First Triad: 05/12/99 Analyst: F P Kennedy

Second Triad: 05/19/99 Analyst: F P Kennedy

	<b>44. 44.</b> (2.00	,,			-
<u>Zero</u>	Ref.	Sample	<u>Zero</u>	<u>Ref.</u>	Sample
0	1369	1765	.02	1361	1747
1-	1384	1773	.17	1369	1749
.11	1389	1779	.5	1370	1751
Mean F	irst Assay: 1	1819 ppm	Mean S	econd Assay:	1813 ppm

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#### **EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS**

**ORDER NO. 016833** 

CUSTOMER

**BOC-DALLAS NORTH** 2615 JOE FIELD RD DALLAS, TX 75229 - 4602 CYLINDER NO:

CC30004

**EXPIRATION DATE: CERTIFICATION DATE:**  05/19/01 05/19/99

CYLINDER PRESSURE:

2000 psig

**PURCHASE ORDER: CUBIX C9006** 

CERTIFIED COMPONENT CONCENTRATION TOTAL RELATIVE UNCERTAINTY

CALIBRATION STANDARDS USED IN ASSAY TYPE LOT ID

CYLINDER

CAS NO.

Nitric Oxlde Total Oxides of Nitrogen 3477 ppm

NTRM 82631

XC014199B

2907 ppm

CONC.

10102-43-9

3492 ppm **Balance Gas** 

10102-43-9

7727-37-9

**ANALYZER READINGS** 

ASSAY LABORATORY: Royal Oak

TEST NUMBER: 72601

COMPONENT:

Nitrogen

Nitric Oxide

Analyzer: ROSEMOUNT Model 951A CHEMI S/N 102022

Last Multipoint Calibration: 04/19/99

First Triad: 05/12/99 Analyst: Lena Ziccarelli

Second Triad: 05/19/99 Analyst: Lena Ziccarelli

+/- 1 %

Zero Ref. Sample 4.85 5.81 n 4.85 5.81 0 4.85 5.81

Mean First Assay: 3483 ppm

<u>Zero</u> Sample Ref. 4.85 5.79 0 0 4.85 5.79 4.85 5.79

Mean Second Assay: 3471 ppm

This Casibration Standard has been certified per the September, 1993 EPA Traceability Protocol, Document EPA-800/R93/224, using Procedure G1. All values certified to be +/- 1% NIST Traceable. Do not use this cylinder below 1.0 Megapascal, i.e., 150psig Comments; SAMPLE WAS RUN USING PROCEDURE G2



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#### **CERTIFICATE OF ANALYSIS**

**EPA PROTOCOL MIXTURE** 

PROCEDURE #: G1

CUSTOMER:

**Cubix Corporation** 

CYLINDER #:

CC88348

SGI ORDER #:

144068

CYLINDER PRES: 2000 PSIG

ITEM#:

CGA OUTLET:

590

P.O.#:

G1254

**CERTIFICATION DATE: 7/13/99** EXPIRATION DATE: 7/12/2002

**CERTIFICATION HISTORY** 

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Monoxide	7/6/99	181.5 ppm	181.6 ppm	+/- 1%
	7/13/99	181.7 ppm	•	
Methane	7/12/99	181.3 ppm	181.3 ppm	+/- 1%
			-	
	}			
	1			

BALANCE

PREVIOUS CERTIFICATION DATES: None

#### **REFERENCE STANDARDS**

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Monoxide	GMIS-1	CC88505	493.6 ppm
Methane	GMIS-1	CC53310	1000.1 ppm
		·	

#### INSTRUMENTATION

423011 NDIR 6/14/9	
	9
0001434 GC - FID 7/12/9	9
00	1434 GC - FID 7/12/9

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST:\_\_\_

DATE:

7/13/99



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**EPA PROTOCOL MIXTURE** 

PROCEDURE #: G1

CUSTOMER:

Cubix Corporation

CYLINDER #:

CC90776

SGI ORDER #:

145941

CYLINDER PRES: 2000 PSIG

ITEM#:

2

**CGA OUTLET:** 

590

P.O.#:

G-1270

**CERTIFICATION DATE: 9/16/99** 

**EXPIRATION DATE:** 

9/07/2002

#### **CERTIFICATION HISTORY**

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Monoxide	9/09/99 9/16/99	449.0 ppm 445.4 ppm	447 ppm	+/- 1%
Methane	9/07/99	455 ppm	455 ppm	+/- 1%
			•	

BALANCE

PREVIOUS CERTIFICATION DATES: None

#### REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Monoxide	GMIS-1	CC88505	493.6 ppm
Methane	GMIS-1	CC52976	503.4 ppm
		***	ســر_

#### INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL#	DETECTOR	CALIBRATION DATE(S)
Carbon Monoxide	Horiba VIA-510	570423011	NDIR	9/15/99
Methane	H. Packard 6890	US00001434	GC - FID	8/19/99

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST:	X!
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DATE:	9/16/99	
DAIL.	3/10/33	



# SPECTRA GASES

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**EPA PROTOCOL MIXTURE** 

PROCEDURE #: G1

CUSTOMER:

**Cubix Corporation** 

CYLINDER #:

CC85095

SGI ORDER #:

129163

CYLINDER PRES: 2000 PSIG

ITEM#:

CGA OUTLET:

590

P.O.#:

G1179

**CERTIFICATION DATE: 12/3/97** 

EXPIRATION DATE: 12/2/2000

#### **CERTIFICATION HISTORY**

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Monoxide	11 <i>1</i> 25/97 12 <i>1</i> 2/97	911.4 ppm 910.9 ppm	911 ppm	+/- 1%
Methane	12/3/97	912.1 ppm	912 ppm	+/- 1%
			·	<u> </u>

#### BALANCE

Air

#### REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Monoxide	NTRM-81681	CC55775	994 ppm
Methane	GMIS-1	CC53310	1000.5 ppm

#### INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL.#	DETECTOR	CALIBRATION DATE(S)
Carbon Monoxide	Horiba VIA-510	570423011	NDIR	12/1/97
Methane	H. Packard 6890	US00001434	GC - FID	12/3/97

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST:

DATE: 12/3/97



# SPECTRA GASES

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#### **CERTIFICATE OF ANALYSIS**

**EPA PROTOCOL MIXTURE** 

PROCEDURE #: G2

CUSTOMER:

**Cubix Corporation** 

CYLINDER #:

CC84994

SGI ORDER #:

129163

CYLINDER PRES: 2000 PSIG

ITEM#:

P.O.#:

G1179

CGA OUTLET:

590

**CERTIFICATION DATE: 12/3/97** EXPIRATION DATE: 12/2/2000

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Monoxide	11/25/97 12/2/97	1806 ppm 1804 ppm	1805 ppm	+/- 1%
Methane	12/3/97	1811 ppm	1811 ppm	+/- 1.5%
			·	
ALANCE	Air		<u> </u>	

#### REFERENCE STANDARDS

SRM/NTRM#	CYLINDER#	CONCENTRATION
NTRM-81681	CC55775	994 ppm
GMIS-1	CC53310	1000.5 ppm
	NTRM-81681	NTRM-81681 CC55775

#### INSTRUMENTATION

MAKE/MODEL	SERIAL#	DETECTOR	CALIBRATION DATE(S)
Horiba VIA-510	570423011	NDIR	12/1/97
H. Packard 6890	US00001434	GC - FID	12/3/97
			Horiba VIA-510 570423011 NDIR

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST:

TED NEEME

DATE:

12/3/97



# Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083

(810) 589-2950 FAX:(810) 589-2134

#### CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS RECERTIFICATION

Customer

CUBIX CORP 2106 NW 67TH PLACE SUITE 7 ATTN RECEIVING GAINESVILLE, FL 32653

Assay Laboratory

Scott Specialty Gases, Inc. 1290 Combernere Troy, MI 48083

Purchase Order:

G1196

Scott Project #:

522949

#### **ANALYTICAL INFORMATION**

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

Cylinder Number: ALM028664

Certificate Date:

Expiration Date:

1/23/2001

Cylinder Pressure +: 1500 psig

Previous Certificate Date:

ANALYZED CYLINDER

Components

Methane Carbon Monoxide **Certified Concentration** 

4162 ppm 4008 ppm Analytical Uncertainty\*

±1% NIST Directly Traceable ±1% NIST Directly Traceable

Balance Gas: Air

+Do not use when cylinder presssure is below 150 psig.

\*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

SRM2751

**Expiration Date** 

Cylinder Number

CAL013497

Concentration

98.6 ppm Methane in Air

NTRM2637

5/8/2003 4/3/98

ALM059632

2513 ppm Carbon Monoxide in Nitrogen

INSTRUMENTATION

Instrument/Model/Serial #

CH4: Varian/1400/08982426 CO: Horiba/A1A-210/57297601 Last Date Calibrated

1/23/98 1/16/98 Analytical Principle

Gas Chromatography Non-dispersive Infrared

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components

Methane

Previous Concentration

Third Triad Analysis

Date: 1/23/98 Response Units: my

Z1=0.00 R1=91.55 R2=91.55

T1=3,812.00 Z2=0 00 T2=3.800.00

T1=32.80

T2=32.80

T3=3,803.00 R35 Conc. of Cust. Cyl: 4157 ppm Calibration Curve

Concentration=A+Bx+Cx+Dx+Ex4 r=1.00000

SRM2751 Constants: A=-3 946554000

B=1.093418000

C=0 0000000000

Carbon Monoxide

Date: 12/14/94

Concentration: 4026 ppm

Date. 12/14/94

Date: 1/16/98

Response Units: my 71=0 00 R1=20 90

R2=20 90 Z2=0.00 Z3=0.00

T3=32.80 R3=20.90 Avg. Conc. of Cust. Cyl; 3991 ppm

D=0.000000000 E=0.000000000

Concentration=A+Bx+Cx2Dx+Ex4 r=1.00000 NTRM2637

Constants A=0.009488474 C=-0 802400900

D=0.017177340

E=0.0000000000

Special Notes

..... Mail 🔄





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#### **CERTIFICATE OF ANALYSIS**

**EPA PROTOCOL MIXTURE** 

PROCEDURE#: G1

CUSTOMER:

**Cubix Corporation** 

CYLINDER #:

CC83913

SGI ORDER#:

156176

CYLINDER PRES: 2000 PSIG

ITEM#:

**CGA OUTLET:** 

590

P.O.#:

2000301 T-5 Rick

**CERTIFICATION DATE: 7/26/2000** 

**EXPIRATION DATE:** 

7/26/2003

**CERTIFICATION HISTORY** 

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Oxygen	7/26/2000	20.8 %	20.8 %	+/- 1%
Carbon Dioxide	7/26/2000	5.04 %	5.04 %	+/- 1%
=				

BALANCE

Nitrogen

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Oxygen	NTRM-82659x	CC83908	22.8 %
Carbon Dioxide	GMIS-1	CC91046	10.03 %
	<del></del>		<del> </del>

#### INSTRUMENTATION

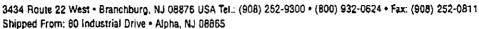
COMPONENT	MAKE/MODEL	SERIAL#	DETECTOR	CALIBRATION DATE(S)
Oxygen	Horiba MPA-510	570694081	PM	7/24/2000
Carbon Dioxide	Horiba VIA-510	571417045	NDIR	7/6/2000

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST:	NP.
	FRED PIKID A

DATE: 7/26/2000
DATE: //20/2000







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**EPA PROTOCOL MIXTURE** 

PROCEDURE #: G1

CYLINDER #:

CC106722

CYLINDER PRES: 2000 PSIG **CGA OUTLET:** 

590

ITEM#: P.O.#:

CUSTOMER:

SGI ORDER #:

146620

**Cubix Corporation** 

99304

**CERTIFICATION DATE: 10/07/99 EXPIRATION DATE:** 10/07/2002

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Oxygen	10/07/99	12.46 %	12.46 %	+/- 1%
Carbon Dioxide	10/07/99	9,99 %	9.99 %	+/- 1%

BALANCE

Nitrogen

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Oxygen	NTRM-82659X	CC83900	22.80 %
Carbon Dioxide	GMIS-1	CC57143	10.00 %

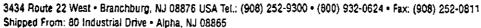
#### INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION
				DATE(S)
Oxygen	Horiba MPA-510	570694081	РM	9/21/99
Carbon Dioxide	Horiba VIA-510	571417045	NDIR	9/23/99
		-		

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

10/07/99 DATE:







**EPA PROTOCOL MIXTURE** 

PROCEDURE #: G1

CUSTOMER:

**Cubix Corporation** 

CYLINDER #:

CC114045

SGI ORDER #:

146038

CYLINDER PRES: 2000 PSIG

ITEM#: P.O.#:

2

CGA OUTLET:

580

**CERTIFICATION DATE: 9/17/98** 

99277

**EXPIRATION DATE:** 9/17/2002

**CERTIFICATION HISTORY** 

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Dioxide	9/17/99	18.01 %	18.01 %	+/- 1%
Oxygen	9/17/99	3.99 %	3.99 %	+/- 1%
				<u>-</u>

BALANCE

Nitrogen

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

		CYLINDER#	CONCENTRATION
Carbon Dioxide	NTRM-82745x	CC79944	20.00 %
Oxygen	GMIS-1	CC53245	10.00 %
·			

#### INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL#	DETECTOR	CALIBRATIO		
	<u></u>			DATE(S)		
Carbon Dioxide	Horiba VIA-510	571417045	NDIR	8/20/99		
Oxygen	Horiba MPA-510	570694081	PM	9/10/99		

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST:	761.	
	FRED PIKIU	Δ

DATE:	9/17/99	

OCT 24 '00 01:08PM CUBIX CORPORATION

Dry Gas Meter Calibration	Date	8/2/2000
Austin Laboratory	Technician	JMC

Austin Laboratory		JMC	
Reference Meter		Working Meter, T-5 Equimeter	
Manufacturer	American Singer	ļ, ————————————————————————————————————	Equimeter
Meter No.	p164240	Meter No.	1695322
Previous Calibration Date	-	Previous Calibration Date	4/3/2000
Calibration Factor	1.0242	Previous Calibration Factor	0.9739
Units of Measure	ft³	Units of Measure	ft³
Run 1		:	
Start Time	12:10:30		12:10:30
Stop Time	12:30:15		12:30:15
Run Time (minutes)	19.75	Run Time (minutes)	19.75
Start Temperature °F	80	Start Temperature °F	82
Stop Temperature (°F)	80	Stop Temperature (°F)	84
Average Temperature (°F)	80	Average Temperature (°F)	83
Start Meter Reading (ft <sup>3</sup> )	0.00	Start Meter Reading (ft³)	52.684
Stop Meter Reading (ft <sup>3</sup> )	10.4	Stop Meter Reading (ft <sup>3</sup> )	63.683
Net Volume (ft <sup>3</sup> )	10.652	Net Volume (ft <sup>3</sup> )	10.999
Meter Rate (ft³/minute)		Meter Rate (ft³/minute)	0.5569
Corrected Volume (ft³ @ STP)	10.257	Corrected Volume (ft <sup>3</sup> @ STP)	10.533
Calculated Meter Factor	0.9738	concetted volume (it @ 511)	10.555
Run 2			
Start Time	12:33:00		12:33:00
Stop Time	12:45:30		12:45:30
Run Time (minutes)	12.5	Run Time (minutes)	12.5
Start Temperature °F	80	Start Temperature °F	84
Stop Temperature (°F)	81	Stop Temperature (°F)	84
Average Temperature (°F)	80.5	Average Temperature (°F)	84
Start Meter Reading (ft³)	0.000	Start Meter Reading (ft³)	63.683
Stop Meter Reading (ft³)	6.272	Stop Meter Reading (ft <sup>3</sup> )	70.346
Net Volume (ft³)	6.424	Net Volume (ft³)	6.663
Meter Rate (ft³/minute)		Meter Rate (ft³/minute)	0.5330
Corrected Volume (ft <sup>3</sup> @ STP)		Corrected Volume (ft³ @ STP)	6.369
Calculated Meter Factor	0.9703		0.507
Run 3			
Start Time	12:48:45		12:48:45
Stop Time	13:03:00	•	13:03:00
Run Time (minutes)	14.25	Run Time (minutes)	14.25
Start Temperature °F	81	Start Temperature °F	84
Stop Temperature (°F)	81	Stop Temperature (°F)	85
Average Temperature (°F)	81	Average Temperature (°F)	84.5
Start Meter Reading (ft³)	0.000	Start Meter Reading (ft <sup>3</sup> )	70.346
Stop Meter Reading (ft³)	7.143	Stop Meter Reading (ft <sup>3</sup> )	77.97
Net Volume (ft³)	7.316	Net Volume (ft³)	7.624
Meter Rate (ft³/minute)		Meter Rate (ft³/minute)	0.5350
Corrected Volume (ft <sup>3</sup> @ STP)			
contected voiding (it @ 011)	7.032	Corrected Volume (ft <sup>3</sup> @ STP)	7.281
Calculated Meter Factor	7.032 <b>0.9658</b>	Corrected Volume (ft' @ STP)	7.281

#### **Pitot Tube Calibration Sheet**

S-Type Tip Inspection (Method 2, Section 4)

#### **Alignment Inspection**

Transverse tube axis pitot-tip angle:

$$\alpha_1 =$$

$$\alpha_2 = 3$$

Each  $\alpha$  must be less than 10° from perpendicular to the transverse tube axis

Longitudinal tube axis pitot-tip angle:

$$\beta_1 = 2$$

Each  $\beta$  must be less than 5° from parrallel to the longitudinal tube axis

Pitot-tip end length alignment:

$$z = (1.0\%)$$
 (in) or cm)

Z must be  $\leq 0.32$  cm (1/8 in)

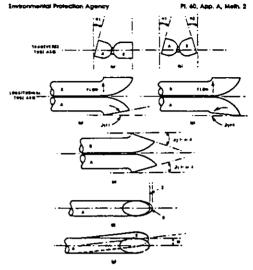


Figure 2-6. Typics of Inco-quarting introductions that can result from fore use or interest construction of Typic 5 plot below. There will not the Landston leads of Capital to large or  $\alpha$  and  $\alpha$  is TP. (i) and  $\beta$  is  $\beta$ 1, 3 4.52 on (148 bit) and  $\alpha$  is \$1.50 on (148 bit) and  $\alpha$  is \$1.50 on (148 bit).

Pitot-tip centriod alignment with respect to transverse axis:

$$W = 0.016$$
 (in or cm)

W must be  $\leq 0.08$  cm (1/32 in)

#### Pitot Tip Dimension Check

External tubing diameter:

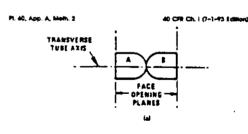
$$D_t = \frac{1/4}{(in)or\ cm)}$$

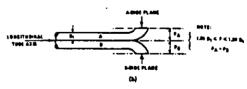
D<sub>1</sub> must be between 0.48 and 0.95 cm (3/16 and 3/8 in)

Base to opening plane distance:

$$P_A = P_B = 0.310$$
 (in or cm)

 $P_A$  and  $P_B$  must be between 1.05  $D_a$  and 1.50  $D_a$ 





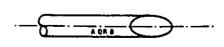


Figure 3-C. Properly communical Type 8 pilor label, shown by polymore, box opening plants personalized to Resource alone, bit for more, tips opening parties provide to explaining associated seek, (c) and were, such significant seek and polymore associated to explain on the seek associated seek, and the seek opening associated seek opening a

#### Pitot Tube Coefficient

 $C_{p} = 0.84$ 

Pitot Tube: #1010

Date and Initials: October 2,2000

Calibration by Cubix Corporation - Austin, Texas - Gainesville, Florida

### Barometer / Altimeter Calibration Check

Date:

**September 11, 2000** 

Technician:

Rick J. Krenzke

**Lab Standard Barometer** 

Working Field Barometer/Altimeter

Manufacturer

Princo

Manufacturer

Mannix Testing & Measurement

Type:

Fortin Type Mercurial

Type:

Digital

Units

in. Hg & mm Hg

Units

in Hg (Absolute)

ID number:

NOVA 453x

Cubix Assign.

T-5

Serial No.

BA888-6

**Laboratory Standard Barometer** 

Uncorrected Lab Barometer Reading	29.51	in. Hg
Temperature of Lab Barometer	68	°F
Multiplier for Temperature Correction ( + or -)	0.001327	unitless
Multiplier for Lattitude Correct. (Austin = $\sim 30.5^{\circ}N$ (+ or -)	-0.004282	unitless
Corrected Laboaratory Barometer Reading	29.42	in. Hg
Corrected Laboaratory Barometer Reading	747	mm Hg
Corrected Laboaratory Barometer Reading	996	mb
Corrected Laboaratory Barometer Reading	460	ft

#### Field Barometer/Altimeter

	<del></del>		
Field Barometer Reading		29.39	in. Hg

Acceptance Criteria

Agreement within 0.1 in. Hg or 2.5 mm Hg, or 100 ft

#### Digital Thermometer Calibration

**Date:** 8/13/2000

**Location:** Cubix Austin Lab

**Technician:** KRH **Barometric Presure:** 29.50' Hg **Ambient Temp:** 73° F

Reference Thermometer / Calibrator

Manufacturer Omega
Model CL23A
Seriel # T-208883
Certificate Date 6/30/1999
Thermocouple Type K Type
Tested By RF
(complies with ANSI/Z540-1-1994)

HH21

Working Thermometer

Cubix ID T-5
Manufacturer Omega

Thermometer: T-69357

Reference Thermo./Calib. (°F)	Working Thermometer (°F)	Temperature Difference (°F)	Abs. Temp. % Diff. (°R)
32.0	40.0	-8.0	-1.63
100.0	99.7	0.3	0.05
212.0	212.0	0.0	0.00
500.0	500.1	-0.1	-0.01
1000.0	999.8	0.2	0.01
1800.0	1800.0 1799.1		0.04
	Average Diff.		-0.25

#### Criteria:

Model

Method 2 Sec 4.3 (in-stack thermometers):

Test within 10% of the observed absolute stack temperature °F+460). Agreement must be less than 1.5% absolute temperature difference between reference and working thermometer.

See also (EMC ALT-011) Emission Mesurement Center, Approved Alternative Method 2 Thermocouple Calibration Procedure.

Method 4 Sec 2.1.4 & M. 5 Sec. 2.1.8 (gas meter thermometers): Thermometers capable of measuring temperature within 3°C (5.4°F).

Method 4 Sec 2.1.2 (last impinger thermometers): The mometer capable of measuring within  $1^{\circ}\text{C}$  (2°F).

# APPENDIX G: LOGGED DATA RECORDS 1-MINUTE INTERVALS

	1		NOx	CO	O <sub>2</sub>	CO <sub>2</sub>	THC	Ave NO <sub>x</sub>	Ave CO	Ave O <sub>2</sub>	Ave CO <sub>2</sub>	Ave THC
Run Number	Date	Time	(ppmv)	(ppmv)	(% vol)	(% vol)	(ppmv)	(ppmv)	(ppmv)	(% vol)	(% vol)	(ppmv)
START 1704C-1	10/3/2000	10:40:03 AM	1694.6	217.9	9.34	6.52	655.8	1694.6	217.9 <sup>°</sup>	9.34	6.52	655.8
1704C-1	10/3/2000	10:41:06 AM	1724.0	220.8	9.31	6.54	1089.1	1690.0	220.7	9.31	6.54	1012.9
1704C-1	10/3/2000	10:42:06 AM	1663.9	223.5	9.31	6.54	977.5	1686.8	222.7	9.32	6.54	1006.8
1704C-1	10/3/2000 -	10:43:06 AM	1698.3	222.8	9.35	6.54	930.9	1694.1	222.7	9.32	6.54	996.8
1704C-1	10/3/2000	10:44:05 AM	1694.6	225.7	9.32	6.54	1018.6	1700.9	223.2	9.33	6.54	998.5
1704C-1	10/3/2000	10:45:05 AM	1673.7	225.7	9.36	6.54	1032.2	1702.0	223.7	9.34	6.54	1011.2
1704C-1	10/3/2000	10:46:05 AM	1688.4	225.2	9.34	6.54	1032.7	1698.4	223.9	9.34	6.54	1016.3
1704C-1	10/3/2000	10:47:06 AM	1721.6	223.8	9.31	6.54	1030.3	1700.3	223.9	9.34	6.54	1015.1
1704C-1	10/3/2000	10:48:06 AM	1695.8	$223.\bar{0}$	9.30	6.54	1064.0	1699.2	224.1	9.34	6.54	1014.7
1704C-1	10/3/2000	10:49:06 AM	1694.6	225.7	9.42	6.54	1019.8	1700.3	224.1	9.35	6.54	1017.6
1704C-1	10/3/2000	10:50:06 AM	1715.5	225.7	9.26	6.56	1022.0	1699.6	224.3	9.35	6.54	1017.7
1704C-1	10/3/2000	10:51:05 AM	1694.6	225.7	9.31	6.54	1119.4	1700.1	224.4	9.34	6.54	1023.1
1704C-1	10/3/2000	10:52:05 AM	1720.4	220.8	9.39	6.54	1111.6	1702.9	224.4	9.35	6.54	1031.5
1704C-1	10/3/2000	10:53:05 AM	1724.0	221.1	9.36	6.54	1134.3	1705.1	224.2	9.35	6.54	1039.8
1704C-1	10/3/2000	10:54:05 AM	1767.0	220.8	9.38	6.54	1152.1	1708.2	223.9	9.35	6.54	1048.0
1704C-1	10/3/2000	10:55:06 AM	1719.1	220.8	9.33	6.54	1147.9	1709.8	223.7	9.35	6.54	1051.8
1704C-1	10/3/2000	10:56:06 AM	1743.7	220.8	9.38	6.54	1071.8	1711.8	223.6	9.35	6.54	1054.6
1704C-1	10/3/2000	10:57:06 AM	1743.7	220.8	9.33	6.55	1080.8	1711.8	223.4	9.35	6.54	1054.7
1704C-1	10/3/2000	10:58:06 AM	1694.6	223.5	9.39	6.55	1030.0	1713.6	223.3	9.35	6.54	1052.6
1704C=1	10/3/2000	10:59:06 AM	1768.3	220.8	9.33	6.54	1077.6	1714.4	223.2	9.35	6.54	1051.8
1704C-1	10/3/2000	11:00:06 AM	1742.5	225.2	9.34	6.54	1104.0	1715.3	223.3	9.35	6.54	1052.2
1704C-1	10/3/2000	11:01:06 AM	1771.9	221.1	9.33	6.54	1104.0	1717.7	223.2	9.35	6.54	1053.7
1704C-1	10/3/2000	11:02:05 AM	1713.0	225.7	9.28	6.55	1109.4	1718.1	223.3	9.35	6.54	1056.7
1704C-1	10/3/2000	11:03:07 AM	1694.6	225.7	9.34	6.54	906.5	1719.0	223.4	9.35	6.54	1059.5
1704C-1	10/3/2000	11:04:06 AM	1752.3	223.8	9.38	6.54	709.7	1719.4	223.4	9.35	6.54	1048.9
1704C-1	10/3/2000	11:05:06 AM	1659.0	228.7	9.37	6.53	792.5	1719.0	223.5	9.35	6.54	1037.0
1704 <u>C</u> -1	10/3/2000	11:06:07 AM	1672.5	225.7	9.40	6.54	841.3	1716.6	223.6	9.35	6.54	1028.9
1704C-1	10/3/2000	11:07:07 AM	1636.9	226.0	9.33	6.55	856.4	1714.5	223.6	9.35	6.54	1022.4
1704C-1	10/3/2000	11:08:07 AM	1670.0	225.7	9.37	6.54	918.9	1712.2	223.7	9.35	6.54	1017.1
1704C-T	10/3/2000	11:09:06 AM	1622.1	225.7	9.38	6.54	888.9	1710.3	223.8	9.35	6.54	1013.7
1704C-1	10/3/2000	11:10:07 AM	1604.9	225.7	9.42	6.52	908.9	1708.0	223.8	9.35	6.54	1010.0
1704 <u>C</u> -i	10/3/2000	11:11:06 AM	1634.4	225.7	9.43	6.51	910.9	1704.5	223.9	9.36	6.54	1006.8
1704C-1	10/3/2000	11:12:06 AM	1574.2	226.7	9.45	6.53	902.6	1701.3	224.0	9.36	6.54	1004.0
1704C-1	10/3/2000	11:13:06 AM	1498.1	230.6	9.51	6.45	1006.8	1696.5	224.2	9.36	6.54	1002.4
1704C-1	10/3/2000	11:14:06 AM	1496.9	230.9	9.57	6.46	912.6	1690.9	224.4	9.37	6.54	1001.2
1704C-1	10/3/2000	11:15:07 AM	1473.5	230.9	9.52	6.47	912.8	1684.4	224.6	9.37	6.54	999.0

		!	NO <sub>x</sub>	CO	O,	CO,	THC	Ave NO <sub>x</sub>	Ave CO	Ave O <sub>2</sub>	Ave CO <sub>2</sub>	Ave THC
Run Number	Date	Time	(ppmv)	(ppmv)	(% vol)	(% vol)	(ppmv)	(ppmv)	(ppmv)	(% vol)	(% vol)	[ (ppmv)
1704C-1	10/3/2000	11:16:06 AM	1471.1	230.6	9.54	6.45	908.2	1678.4	224.8	9.37	6.53	997.0
1704C-1	[10/3/2000]	11:17:06 AM	1430.6	235.6	9.54	6.45	914.8	1671.9	225.0	9.38	6.53	995.2
1704C-1	10/3/2000	11:18:07 AM	1408.5	235.6	9.58	6.45	954.3	1665.7	225.3	9.38	6.53	993.7
1704C-1	10/3/2000	11:19:06 AM	1375.3	235.6	9.56	6.45	967.5	1658.7	225.5	9.39	6.53	993.0
1704C-1	10/3/2000	11:20:06 AM	1350.8	237.5	9.55	6.44	936.5	1651.7	225.8	9.39	6.53	992.5
1704C-1	10/3/2000	11:21:07 AM	1350.8	235.6	9.58	6.45	929.7	1644.0	226.1	9.40	$6.\overline{52}$	990.9
1704C-1	10/3/2000	11:22:07 AM	1285.7	237.3	9.65	6.39	932.1	1636.3	226.3	9.40	6.52	989.5
1704C-1	10/3/2000	11:23:07 AM	1252.5	240.5	9.65	6.40	949.7	1627.4	226.6	9.41	6.52	988.7
1704C-1	10/3/2000	11:24:07 AM	1266.0	240.5	9.65	6.35	979.0	1618.9	227.0	9.41	$6.\bar{51}$	988.3
1704C-1	10/3/2000	11:25:06 AM	1192.3	242.9	9.62	6.36	961.2	1610.2	227.3	9.42	6.51	987.8
1704C-1	10/3/2000	11:26:06 AM	1178.8	242.9	9.68	6.35	1038.3	1601.6	227.6	9.42	6.51	987.9
1704C-1	10/3/2000	11:27:07 AM	1170.2	243.2	9.72	6.36	1020.5	1592.6	$2\bar{2}8.0^{-}$	9.43	$^{-}6.\bar{5}0$	989.0
1704C-1	10/3/2000	11:28:07 AM	1105.2	244.9	9.79	6.33	1065.4	1583.6	228.3	9.44	$6.\bar{5}0$	990.4
1704C-1	10/3/2000	11:29:07 AM	1105.2	242.7	9.77	6.35	1095.7	1573.8	228.6	9.44	$6.5\bar{0}$	992.1
1704C-1	10/3/2000	11:30:07 AM	1080.6	245.4	9.73	6.35	1088.9	1564.6	228.9	9.45	6.50	990.4
1704C-1	10/3/2000	11:31:07 AM	1056.0	245.9	9.73	6.34	1039.3	1555.2	229.2	9.46	6.49	991.1
1704C-1	10/3/2000	11:32:07 AM	1006.9	245.4	9.81	6.31	1112.1	1545.4	229.5	9.46	6.49	992.8
1704C-1	10/3/2000	11:33:07 AM	1024.1	245.6	9.76	6.33	1220.0	1535.7	229.8	9.47	$\bar{6}.49$	995.9
1704C-1	10/3/2000	11:34:07 AM	986.0	250.3	9.76	6.25	$135\bar{3}.0$	1525.4	230.4	9.49	6.47	, 1017.0
1704C-1	10/3/2000	11:38:07 AM	901.3	250.3	9.91	6.25	1373.3	1487.5	231.5	9.50	6.47	1022.9
1704C-1	10/3/2000	11:39:07 AM	870.6	255.2	9.92	6.25	1455.1	1477.9	231.9	9.51	6.47	1029.8
END 1704C-1	10/3/2000	11:40:03 AM	905.0	251.3	9.77	6.27	1494.1	1468.7	232.2	9.51	6.46	1036.3

			NO <sub>x</sub>	CO	O <sub>2</sub>	CO <sub>2</sub>	THC	Ave NO <sub>x</sub>	Ave CO	Avc O <sub>2</sub>	Ave CO <sub>2</sub>	Ave THC
Run Number	Date	Time	(ppmv)	(ppmv)	(% vol)	(% vol)	(ppmv)	(ppmv)	(ppmv)	(% vol)	(% vol)	(ppmv)
	10/3/2000	1:37:04 PM	1596.3	227.2	9.23	6.64	1588.6	1596.3	227.2	9.23	6.64	1588.6
1704C-2	10/3/2000	1:38:06 PM	1534.9	230.6	9.20	6.64	1699.7	1571.7	228.3	9.17	6.64	1640.4
1704C-2	10/3/2000	1:39:06 PM	1550.9	227.9	9.16	6.64	1655.5	1557.4	229.3	9.17	6.64	1651.8
1704C-2	10/3/2000	1:40:06 PM	1522.7	230.6	9.18	6.64	1746.6	1557.2	229.3	9.18	6.64	1668.4
1704C-2	10/3/2000	1:41:06 PM	1521.4	230.4	9.22	6.64	1746.1	1547.1	229.5	9.18	6.64	1686.9
1704C-2	10/3/2000	1:42:06 PM	1479.7	230.2	9.17	6.64	1787.6	1534.8	229.7	9.19	6.64	1704.2
1704C-2	10/3/2000	1:43:06 PM	1550.9	227.9	9.21	6.64	1687.7	1533.0	229.5	9.19	6.64	1711.9
1704C-2	10/3/2000	1:44:07 PM	1547.2	230.2	9.19	6.62	1739.5	1535.6	229.4	9.19	6.64	1714.5
1704C-2	10/3/2000	1:45:07 PM	1500.6	230.2	9.26	6.64	1766.1	1532.8	229.6	9.19	6.63	1721.7
1704C-2	10/3/2000	1:46:07 PM	1517.8	230.2	9.19	6.64	1522.2	1530.3	229.5	9.19	6.64	1719.4
1704C-2	10/3/2000	1:47:07 PM	1488.3	226.5	9.17	6.64	1523.4	1528.3	229.6	9.19	6.63	1699.4
1704C-2	10/3/2000	1:48:07 PM	1507.9	230.2	9.28	6.62	1639.2	1528.1	229.4	9.19	6.63	1690.2
1704C-2	10/3/2000	1:49:06 PM	1476.0	230.2	9.16	6.64	1666.0	1522.9	229.4	9.19	6.63	1688.3
	10/3/2000	1:50:07 PM	1498.1	230.6	9.30	6.63	1726.3	1521.8	229.5	9.19	6.63	1689.0
1704C-2	10/3/2000	1:51:07 PM	1547.2	228.4	9.22	6.64	1723.4	1521.4	229.5	9.20	6.63	1691.8
	10/3/2000	1:52:07 PM	1498.1	230.9	9.20	6.64	1725.3	1522.3	229.5	9.20	6.63	1695.5
	10/3/2000	1:53:07 PM	1511.6	230.6	9.25	6.63	1726.1	1522.0	229.6	9.20	6.63	1696.0
1704C-2	10/3/2000	1:54:06 PM	1522.7	227.9	9.16	6.64	1737.5	1520.2	229.6	9.19	6.63	1698.0
1704C-2	10/3/2000	1:55:06 PM	1468.6	230.6	9.13	6.64	1746.3	1520.3	229.7	9.20	6.63	1700.8
1704C-2	10/3/2000	1:56:07 PM	1520.2	230.6	9.12	6.64	1731.0	1519.4	229.7	9.19	6.63	1703.4
1704C-2	10/3/2000	1:57:07 PM	1479.7	230.6	9.12	6.65	1644.3	1519.0	229.7	9.19	6.63	1704.9
	10/3/2000	1:58:07 PM	1547.2	227.9	9.16	6.64	1704.6	1519.7	229.8	9.19	6.63	1703.3
1704C-2	10/3/2000	1:59:07 PM	1514.1	230.6	9.21	6.64	1765.9	1519.6	229.8	9.19	6.63	1704.5
	10/3/2000	2:00:07 PM	1536.2	229.9	9.17	6.64	1752.7	1520.5	229.8	9.19	6.63	1707.3
1704C-2	10/3/2000	2:01:06 PM	1507.9	230.6	9.14	6.64	1699.7	1520.7	229.8	9.19	6.64	1708.3
	10/3/2000	2:02:06 PM	1468.6	235.6	9.23	6.64	1722.7	1520.0	229.9	9.19	6.64	1709.8
	10/3/2000	2:03:07 PM	1507.9	230.6	9.17	6.61	1681.4	1518.9	230.0	9.19	6.64	1711.1
	10/3/2000	2:04:08 PM	1498.1	230.6	9.20	6.55	1640.1	1517.8	230.0	9.19	6.63	1708.1
1704Č-2	10/3/2000	2:05:07 PM	1465.0	230.6	9.16	6.64	1716.8	1516.7	230.1	9.19	6.63	1707.7
1704C-2	10/3/2000	2:06:07 PM	1522.7	230.6	9.23	6.64	1734.6	1516.3	230.1	9.19	6.63	1708.1
1704C-2	10/3/2000	2:07:07 PM	1498.1	230.6	9.10	6.64	1727.1	1516.0	230.1	9.19	6.63	1709.2
1704C-2	10/3/2000	2:08:07 PM	1522.7	230.6	9.20	6.64	1734.9	1515.9	230.1	9.19	6.63	1709.7
1704C-2	10/3/2000	2:09:08 PM	1527.6	$\bar{2}25.7$	9.23	6.63	1747.6	1515.8	230.1	9.19	6.63	1710.2
1704C-2	10/3/2000	2:10:08 PM	1466.2	225.7	9.20	6.64	1744.1	1515.6	230.0	9.19	$6.6\bar{3}$	1711.1
	10/3/2000	2:11:07 PM	1530.0	225.7	9.16	6.64	1722.9	1514.8	229.8	9.19	$6.6\overline{3}$	1711.6
1704C-2	10/3/2000	2:12:07 PM	1460.0	230.6	9.18	6.63	1719.7	1514.5	229.8	9.19	6.63	1711.6

			NOx	CO	O <sub>2</sub>	CO,	THC	Ave NO <sub>x</sub>	Ave CO	Ave O <sub>2</sub>	Ave CO2	Ave THC
Run Number	Date	Time	(ppmv)	(ppmv)	(% vol)	(% vol)	(ppmv)	[ (ppmv)	(ppmv)	(% vol)	(% vol)	(ppmv)
1704C-2	10/3/2000	2:13:07 PM	1523.9	227.5	9.18	6.64	1711.7	1514.3	229.8	9.19	6.63	1711.3
1704C-2	10/3/2000	2:14:07 PM	1474.8	230.6	9.21	6.63	1761.0	1513.9	229.8	9.19	6.63	1711.8
1704C-2	10/3/2000	2:15:07 PM	1499.3	230.4	9.23	6.63	1741.5	1513.1	229.8	9.19	6.63	1712.7
1704C-2	10/3/2000	2:16:07 PM	1522.7	226.2	9.20	6.57	1708.0	1512.8	229.7	9.19	6.63	1713.6
1704C-2	10/3/2000	2:17:08 PM	1538.6	226.2	9.19	6.64	1711.2	1513.2	229.6	9.19	6.63	1714.1
1704C-2	10/3/2000	2:18:07 PM	1549.7	227.5	9.13	6.64	1742.2	1514.2	229.6	9.19	6.63	1714.6
1704C-2	10/3/2000	2:19:08 PM	1498.1	230.6	9.15	6.64	1637.2	1514.1	229.6	9.19	6.63	1713.4
1704C-2	10/3/2000	2:20:08 PM	1397.4	230.6	9.20	6.64	1680.9	1513.1	229.6	9.19	6.63	1711.5
1704C-2	10/3/2000	2:21:08 PM	1504.2	230.6	9.19	6.63	1694.3	1512.0	229.7	9.19	6.63	1710.6
1704C-2	10/3/2000	2:22:08 PM	1452.7	230.6	9.17	6.64	1743.2	1511.1	229.7	9.19	6.63	1711.1
1704C-2	10/3/2000	2:23:07 PM	1532.5	230.6	9.20	6.64	1711.7	1511.7	229.7	9.19	6.63	1711.1
1704C-2	10/3/2000	2:24:07 PM	1494.4	230.2	9.16	6.64	1682.6	1511.8	229.7	9.19	6.63	1711.0
1704C-2	10/3/2000	2:25:08 PM	1506.7	228.2	9.16	6.64	1668.2	1511.9	229.6	9.19	6.63	1710.2
1704C-2	10/3/2000	2:26:07 PM	1474.8	230.6	9.14	6.64	1681.6	1512.4	229.6	9.19	6.63	1709.8
1704C-2	10/3/2000	2:27:07 PM	1498.1	230.6	9.24	6.61	1726.6	1511.8	229.6	9.19	6.63	1710.6
1704C-2	10/3/2000	2:28:08 PM	1515.3	230.6	9.14	6.61	1707.5	1512.1	229.6	9.19	6.63	1711.1
1704C-2	10/3/2000	2:29:08 PM	1457.6	232.9	9.16	6.64	1720.9	1511.4	229.6	9.19	6.63	1711.4
1704C-2	10/3/2000	2:30:08 PM	1461.3	230.6	9.15	6.64	1769.3	1510.6	229.7	9.19	6.63	1712.1
1704C-2	10/3/2000	2:31:08 PM	1474.8	230.6	9.20	6.64	1711.2	1510.2	229.7	9.19	$6.6\bar{3}$	1712.6
1704C-2	10/3/2000	2:32:08 PM	1473.5	231.9	9.18	6.64	1762.5	1509.8	229.7	9.19	6.63	1713.0
1704C-2	10/3/2000	2:33:07 PM	1547.2	230.6	9.16	6.63	1734.1	1510.0	229.7	9.19	6.63	1713.4
1704C-2	10/3/2000	2:34:08 PM	1501.8	234.3	9.19	6.64	1680.4	1509.4	229.8	9.19	6.63	1713.4
1704C-2	10/3/2000	2:35:08 PM	1510.4	235.3	$9.\bar{2}7$	6.61	1372.3	1509.0	229.9	9.19	6.63	1709.5
1704C-2	10/3/2000	2:36:08 PM	1482.1	235.1	9.11	6.65	1622.3	1508.6	230.0	9.19	6.63	1705.9
END 1704C-2	10/3/2000	2:37:04 PM	1452.7	231.6	9.14	6.64	1593.5	1507.9	230.0	9.19	6.63	1703.0

	1		, NO <sub>x</sub>	CO	O,	CO <sub>2</sub>	THC	Ave NO <sub>x</sub>	Ave CO	Ave O <sub>2</sub>	Ave CO <sub>2</sub>	Ave THC
Run Number	Date	Time	(ppmv)	(ppmv)	(% vol)	(% vol)	(ppmv)	(ppmv)	(ppmv)	(% vol)	(% vol)	(ppmv)
START 1704C-3	10/3/2000	3:02:46 PM	1528.8	235.6	9.20	6.64	1160.6	1528.8	235.6	9.20	6.64	1160.6
1704C-3	10/3/2000	3:03:49 PM	1596.3	230.6	9.17	6.64	1176.8	1557.1	233.7	9.23	6.62	1164.6
1704C-3	10/3/2000	3:04:48 PM	1598.8	232.1	9.21	6.64	1148.2	1563.7	232.5	9.22	6.63	1161.9
1704C-3	10/3/2000	3:05:48 PM	1526.3	235.3	9.16	6.64	1163.1	1568.5	232.2	9.21	6.63	1159.7
1704C-3	10/3/2000	3:06:48 PM	1575.5	235.6	9.11	6.66	1148.4	1563.9	232.8	9.20	6.63	1157.9
1704C-3	10/3/2000	3:07:49 PM	1493.2	235.6	9.04	6.66	1133.5	1570.0	233.2	9.18	6.64	1155.7
1704C-3	10/3/2000	3:08:49 PM	1555.8	230.6	9.22	6.64	1160.9	1568.8	233.1	9.18	6.64	1155.0
1704C-3	10/3/2000	3:09:49 PM	1668.8	226.0	9.20	6.64	1163.1	1574.5	232.7	9.18	6.64	1155.0
1704C-3	10/3/2000	3:10:48 PM	1596.3	227.5	9.22	6.64	1140.9	1582.7	231.8	9.19	$6.6\overline{3}$	1155.6
1704C-3	10/3/2000	3:11:49 PM	1644.2	222.1	9.21	6.63	1140.9	1590.9	231.1	9.19	6.63	1154.9
	10/3/2000	3:12:48 PM	1671.2	225.7	9.14	6.64	1142.1	1597.6	230.5	9.20	6.63	1153.2
	10/3/2000	3:13:48 PM	1611.1	-3.2	9.14	6.64	1156.3	1604.0	216.8	9.20	6.63	1152.4
	10/3/2000	3:14:48 PM	1652.8	225.7	9.21	6.62	1156.0	1607.3	210.4	9.20	6.63	1152.6
1704C-3	10/3/2000	3:15:48 PM	1694.6	221.6	9.21	6.58	1144.0	1608.2	211.5	9.20	6.63	1152.2
1704C-3	10/3/2000	3:16:49 PM	1608.6	224.8	9.30	6.55	1137.9	1612.6	212.4	9.20	6.63	1151.9
1704C-3	10/3/2000	3:17:49 PM	1596.3	225.7	9.28	6.61	1146.7	1613.8	213.2	9.21	6.62	1151.8
1704C-3	10/3/2000	3:18:49 PM	1652.8	225.0	9.23	6.63	1113.8	1615.1	213.9	9.21	6.62	1150.7
1704C-3	10/3/2000	3:19:49 PM	1620.9	225.7	9.29	6.54	1156.7	1617.3	214.4	9.21	6.62	1150.6
1704C-3	10/3/2000	3:20:49 PM	1643.0	227.2	9.16	6.63	1149.7	1616.3	215.1	9.21	6.62	1150.2
1704C-3	10/3/2000	3:21:48 PM	1614.8	230.6	9.25	6.57	1131.8	1617.4	215.8	9.21	6.62	1149.7
	10/3/2000	3:22:48 PM	1645.5	220.8	9.30	6.55	1134.0	1617.0	216.2	9.21	6.62	1149.1
•	10/3/2000	3:23:49 PM	1646.7	224.8	9.19	6.60	1148.2	1616.8	216.6	9.22	$6.6\bar{2}$	1148.8
I	10/3/2000	3:24:49 PM	1596.3	225.7	9.36	6.56	1174.1	1616.2	217.0	9.22	6.62	1149.0
	10/3/2000	3:25:49 PM	1494.4	225.7	9.28	6.60	1146.0	1614.1	217.4	9.22	6.61	1149.4
	10/3/2000	3:26:48 PM	1574.2	221.6	9.22	6.63	1144.8	1613.3	217.6	9.22	6.61	1149.6
1704C-3	10/3/2000	3:27:49 PM	1550.9	230.6	9.25	6.57	1165.5	1611.7	218.0	9.23	6.61	1150.2
	10/3/2000	3:28:49 PM	1624.6	225.7	9.23	6.56	1160.2	1610.6	218.3	9.23	6.61	1150.5
1704C-3	10/3/2000	3:29:49 PM	1647.9	222.3	9.34	6.54	1172.4	1610.6	218.5	9.23	6.61	1150.9
1704C-3	10/3/2000	3:30:50 PM	1547.2	227.0	9.36	6.54	1157.7	1609.2	218.8	9.23	6.61	1151.4
1704C-3	10/3/2000	3:31:49 PM	1547.2	230.6	9.22	6.57	1160.2	1607.5	219.2	9.24	6.60	1151.7
1704C-3	10/3/2000	3:32:49 PM	1575.5	225.7	9.27	6.57	1166.5	1606.0	219.5	9.24	6.60	1151.9
1704C-3	10/3/2000	3:33:50 PM	1547.2	230.6	9.33	6.54	1149.9	1604.8	219.8	9.24	6.60	1151.9
	10/3/2000	3:34:49 PM	1568.1	225.7	9.33	6.54	1160.2	1603.7	220.0	9.24	6.60	1152.2
1704C-3	10/3/2000	3:35:50 PM	1574.2	229.7	9.26	6.59	1144.5	1602.7	220.3	9.24	$6.6\overline{0}$	1152.4
	10/3/2000	3:36:49 PM	1555.8	230.6	9.23	6.55	1164.1	1602.3	220.5	9.24	6.60	1152.6
1704C-3	10/3/2000	3:37:49 PM	1546.0	227.9	9.36	6.57	1124.3	1600.7	220.8	9.24	6.60	1152.6

	ŀ		NO <sub>x</sub>	CO	O <sub>2</sub>	CO <sub>2</sub>	THC	Ave NO <sub>x</sub>	Ave CO	Ave O <sub>2</sub>	Ave CO <sub>2</sub>	Ave THC
Run Number	Date	Time	(ppmv)	(ppmv)	(% vol)	(% vol)	(ppmv)	(ppmv)	(ppmv)	(% vol)	(% vol)	(ppmv)
1704C-3	10/3/2000	3:38:49 PM	1534.9	230.6	9.21	6.55	1156.3	1599.6	221.1	9.24	6.60	1152.5
1704C-3	10/3/2000	3:39:49 PM	1580.4	230.4	9.27	6.56	1151.9	1598.4	221.3	9.24	6.59	1152.3
1704C-3	10/3/2000	3:40:50 PM	1528.8	230.2	9.27	6.56	1147.0	1597.2	221.5	9.25	6.59	1152.1
1704C-3	10/3/2000	3:41:49 PM	1584.1	226.0	9.36	6.54	1154.1	1596.6	221.7	9.25	6.59	1151.7
1704C-3	10/3/2000	3:42:49 PM	1620.9	230.6	9.28	6.55	1131.1	1595.4	221.9	9.25	6.59	1151.5
1704C-3	10/3/2000	3:43:50 PM	1536.2	230.6	9.36	6.54	1119.6	1594.4	222.1 i	9.25	6.59	1151.1
1704C-3	10/3/2000	3:44:49 PM	1547.2	233.3	9.38	6.54	1132.1	1592.5	222.3	9.25	6.59	1150.9
1704C-3	10/3/2000	3:45:50 PM	1520.2	235.6	9.23	6.54	1151.9	1590.7	222.6	9.25	6.59	1150.7
1704C-3	10/3/2000	3:46:49 PM	1533.7	230.6	9.32	6.54	1150.9	1589.2	222.9	9.25	6.59	1150.5
1704C-3	10/3/2000	3:47:50 PM	1530.0	230.6	9.27	6.55	1133.5	1588.0	223.1	9.25	6.59	1150.2
1704C-3	10/3/2000	3:48:50 PM	1522.7	230.9	9.37	6.55	1138.9	1587.1	223.2	9.25	6.59	1149.8
1704C-3	10/3/2000	3:49:50 PM	1549.7	230.6	9.30	6.54	1130.9	1586.0	223.4	9.25	6.59	1149.6
1704C-3	10/3/2000	3:50:50 PM	1522.7	230.6	9.23	6.57	1155.5	1584.9	223.5	9.25	6.59	1149.4
1704C-3	10/3/2000	3:51:50 PM	1510.4	$\bar{2}33.6$	9.24	6.59	1123.3	1583.7	223.7 i	9.26	6.59	1149.1
1704C-3	10/3/2000	3:52:49 PM	1498.1	230.9	9.17	6.62	1142.1	1582.7	223.9	9.26	6.59	1149.1
1704C-3	10/3/2000	3:53:50 PM	1601.3	230.9	9.25	6.54	1129.2	1582.2	224.0	9.26	6.59	1148.9
1704C-3	10/3/2000	3:54:50 PM	1531.3	230.6	9.32	6.56	1143.1	1581.7	224.1	9.26	6.58	1148.7
1704C-3	10/3/2000	3:55:50 PM	1595.1	230.6	9.24	6.55	1128.4	1581.4	224.3	9.26	6.58	1148.5
1704C-3	10/3/2000	3:56:50 PM	1548.5	230.6	9.41	6.60	1141.1	1580.9	224.4	9.26	6.58	1148.4
1704C-3	10/3/2000	3:57:50 PM	1571.8	230.6	9.29	6.54	1126.5	1580.5	224.5	9.26	6.58	1148.3
1704C-3	10/3/2000	3:58:50 PM	1520.2	231.4	9.28	6.58	984.1	1580.0	224.6	9.26	6.58	1148.0
1704C-3	10/3/2000	3:59:50 PM	1550.9	235.1	9.28	6.55	918.2	1579.7	224.8	9.26	6.58	1143.9
1704C-3	10/3/2000	4:00:51 PM	1562.0	230.6	9.19	6.55	949.7	1579.4	224.9	9.26	6.58	1140.3
1704C-3	10/3/2000	4:01:50 PM	1520.2	231.1	9.28	6.55	1033.4	1578.9	225.0	9.26	6.58	1137.7
END 1704C-3	10/3/2000	4:02:47 PM	1596.3	230.6	9.25	6.54	1103.0	1578.5	225.1	9.26	6.58	1136.7

# APPENDIX H FDEP TITLE V PERMIT



# Department of Environmental Protection

Lawton Chiles

Central District 3319 Maguire Boulevard, Suite 232 Orlando, Florida 32803-3767

Virginia B. Wetherell Secretary

Certified Mail P 183 848 991

#### NOTICE OF FINAL PERMIT

In the Matter of an Application for Permit by:

William E. Rome, Vice President Florida Gas Transmission Company 1400 Smith Street Houston, Texas 77002 FINAL Permit No.: 0830070-001-AV Compressor Station No. 17

Enclosed is FINAL Permit Number 0830070-001-AV for the operation of the Compressor Station No. 17 located at County Road 314, 17 miles northeast of Silver Springs, Marion County, issued pursuant to Chapter 403, Florida Statutes (F.S.).

Any party to this order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the permitting authority in the Legal Office; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 (thirty) days from the date this Notice is filed with the Clerk of the permitting authority.

Executed in Orlando, Florida.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Program Administrator

Air Resources Management

Ú<sup>1</sup>√ LTK/azt FINAL Permit No.: 0830070-001-AV

Page 2 of 2

#### CERTIFICATE OF SERVICE

In addition, the undersigned duly designated deputy agency clerk hereby certifies that copies of this NOTICE OF FINAL PERMIT (including the FINAL permit) were sent by U.S. mail on the same date to the person(s) listed:

Jimmy D. Harp, P.E. (Florida Gas Transmission Company)
Bruce Mitchell, DARM, BAR, Title V Section
Ms. Carla E. Pierce, USEPA, Region 4 (INTERNET E-mail Memorandum)
Ms. Yolanda Adams, USEPA, Region 4 (INTERNET E-mail Memorandum)

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to Section 120.52(7), Florida Statutes, with the designated agency Clerk, receipt of which is hereby acknowledged.

na Jones Feb. 18, 1998 (Date)

Florida Gas Transmission Company Compressor Station No. 17 Facility ID No.: 0830070 Marion County

Initial Title V Air Operation Permit FINAL Permit No.: 0830070-001-AV

Permitting Authority:

Florida Department of Environmental Protection 3319 Maguire Boulevard, Suite 232 Orlando, Florida 32803 Telephone: 407/894-7555

Fax: 407/897-5963

# Initial Title V Air Operation Permit FINAL Permit No.: 0830070-001-AV

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# Department of Environmental Protection

Lawton Chiles Governor Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Virginia B. Wetherell Secretary

Permittee:

Florida Gas Transmission Company 1400 Smith Street

Houston, Texas 77002

Atten: William E. Rome, Vice President

FINAL Permit No.: 0830070-001-AV

Facility ID No.: 0830070 SIC Nos.: 49, 4922

Project: Compressor Station No. 17

This permit is for the operation of the Compressor Station No. 17. This facility is located at County Road 314, 17 miles northeast of Silver Springs, Marion County; UTM Coordinates: Zone 17,418.8 km East and 3240.9 km North; Latitude: 29° 17' 47" North and Longitude: 81° 50' 08" West.

STATEMENT OF BASIS: This Title V air operation permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.) and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-213. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents, attached hereto or on file with the permitting authority, in accordance with the terms and conditions of this permit.

Referenced attachments made a part of this permit:

APPENDIX I-1, LIST OF INSIGNIFICANT EMISSION UNITS AND/OR ACTIVITIES APPENDIX TV-1, TITLE V CONDITIONS (Version Dated 12/2/97)
APPENDIX SS-1, STACK SAMPLING FACILITIES (Version Dated 10/7/96)
Table 297.310-1, CALIBRATION SCHEDULE (Version Dated 10/7/96)

Effective Date:

Renewal Application Due Date: October 30, 2000

Expiration Date: April 30, 2001

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

L.T. Kozlov, P.F.

Air Resources Management

LTK/azt

## Section I. Facility Information.

## Subsection A. Facility Description.

This facility consists of seven natural gas fired internal combustion engines. Four are rated at 2000 bhp and are manufactured by Cooper-Bessemer, Model LS-8-SG and one is rated at 2400 bhp and is manufactured by Dresser-Rand, Model 412KVSRA. Two engines are used to generate electricity and are 395 bhp each, manufactured by Waukesha, Model LRO. This facility is part of a natural gas pipeline system serving the State of Florida.

Also included in this permit are miscellaneous exempt emission units and/or activities.

Based on the initial Title V permit application received June 17, 1996, this facility is not a major source of hazardous air pollutants (HAPs).

Subsection B. Summary of Emissions Unit ID No(s). and Brief Description(s).

## E.U. ID No./Brief Description

001	I. C. Engine No. 1701 (2000 bhp)
002	I. C. Engine No. 1702 (2000 bhp)
003	I. C. Engine No. 1703 (2000 bhp)
004	I. C. Engine No. 1704 (2000 bhp)
005	I C Engine No. 1705 (2400 bhn)

006 I. C. Engine No. 1706 (395 bhp)

007 I. C. Engine No. 1707 (395 bhp)

Please reference the Permit No., Facility ID No., and appropriate Emissions Unit(s) ID No(s). on all correspondence, test report submittals, applications, etc.

#### Subsection C. Relevant Documents.

The documents listed below are not a part of this permit, however, are specifically related to this permitting action.

These documents are provided to the permittee for information purposes only: Appendix A-1, Abbreviations, Acronyms, Citations, and Identification Numbers Appendix H-1, Permit History / ID Number Changes

These documents are on file with permitting authority: Initial Title V Permit Application received June 17, 1996.

Additional information request dated May 23, 1997.

Additional information received September 25, 1997.

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## Section II. Facility-wide Conditions.

The following conditions apply facility-wide:

- 1. APPENDIX TV-1, TITLE V CONDITIONS (version dated 12/2/97), is a part of this permit. APPENDIX TV-1, TITLE V CONDITIONS, is distributed to the permittee only. Other persons requesting copies of these conditions shall be provided one copy when requested or otherwise appropriate.
- 2. Not Federally Enforceable. General Pollutant Emission Limiting Standards. Objectionable Odor Prohibited. The permittee shall not cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor.
  [Rule 62-296.320(2), F.A.C.]
- 3. General Particulate Emission Limiting Standards. General Visible Emissions Standard. Except for emissions units that are subject to a particulate matter or opacity limit set forth or established by rule and reflected by conditions in this permit, no person shall cause, let, permit, suffer or allow to be discharged into the atmosphere the emissions of air pollutants from any activity, the density of which is equal to or greater than that designated as Number 1 on the Ringelmann Chart (20 percent opacity). EPA Method 9 is the method of compliance pursuant to Rule 62-297, F.A.C. [Rule 62-296.320(4)(b)1. & 4., F.A.C.]
- 4. Prevention of Accidental Releases (Section 112(r) of CAA). If required by 40 CFR 68, the permittee shall submit to the implementing agency:
  - a. a risk management plan (RMP) when, and if, such requirement becomes applicable; and
- b. certification forms and/or RMPs according to the promulgated rule schedule. [40 CFR 68]
- 5. <u>Insignificant Emissions Units and/or Activities</u>. Appendix I-1, List of Insignificant Emissions Units and/or Activities, is a part of this permit. [Rules 62-213.440(1), 62-213.430(6), and 62-4.040(1)(b), F.A.C.]
- 6. When appropriate, any recordings, monitoring, or reporting requirements that are time-specific shall be in accordance with the effective date of the permit, which defines day one. [Rule 62-213.440, F.A.C.]
- 7. The permittee shall submit all compliance related notifications and reports required of this permit to the air compliance section of this office:

Florida Department of Environmental Protection 3319 Maguire Blvd., Suite 232 Orlando, Florida 32803 Telephone: 407/893-3334

Fax: 407/897-5963

FINAL Permit No.: 0830070-001-AV

8. Any reports, data, notifications, certifications, and requests required to be sent to the United States Environmental Protection Agency, Region 4, should be sent to:

United States Environmental Protection Agency Region 4
Air, Pesticides & Toxics Management Division Operating Permits Section 61 Forsyth Street Atlanta, Georgia 30303 Telephone: 404/562-9099

Fax: 404/562-9095

## Section III. Emissions Unit(s) and Conditions.

## Subsection A. This section addresses the following emissions unit.

E.U. ID No./ Brief Description						
001	I. C. Engine No. 1701 (2000 bhp)					
002	I. C. Engine No. 1702 (2000 bhp)					
003	I. C. Engine No. 1703 (2000 bhp)					
004	I. C. Engine No. 1704 (2000 bhp)					
005	I. C. Engine No. 1705 (2400 bhp)					
006	I. C. Engine No. 1706 (395 bhp)					
007	I. C. Engine No. 1707 (395 bhp)					

Four internal combustion engines are rated at 2000 bhp each and are manufactured by Cooper-Bessemer, Model LS-8-SG. One internal combustion engine is rated at 2400 bhp and is manufactured by Dresser-Rand, Model 412KVSRA. Two internal combustion engines are rated at 395 bhp each and are manufactured by Waukesha, Model LRO.

The following conditions apply to the emissions unit(s) listed above:

## Essential Potential to Emit (PTE) Parameters

1. Capacity. The maximum heat input for each engine nos. 1701, 1702, 1703, and 1704 shall not exceed 15 MMBTU/hr. The maximum natural gas consumption for engine no. 1705 shall not exceed 20,569 scf/hr. and the maximum heat input shall not exceed 21.19 MMBTU/hr. The maximum heat input for engine nos. 1706 and 1708 shall not exceed a total of 27,768 MMBTU per consecutive twelve months.

[Rule 62-210.200, (PTE), F.A.C. and Title V permit application received June 17, 1996]

- 2. Methods of Operation. Each engine is allowed to use natural gas only. [Rule 62.210.200, (PTE), F.A.C.]
- 3. <u>Hours of Operation</u>. Each engine is allowed to operate continuously except engine nos. 1706 and 1707 which shall not exceed a total of 8760 hours per consecutive twelve months. [Rule 62-210.200, (PTE), F.A.C. and Title V permit application received June 17, 1996]
- 4. Emissions Unit Operating Rate Limitation After Testing. See specific condition no. 14. [Rule 62-297.310(2), F.A.C.]

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## Emission Limitations and Standards

5. The maximum allowable emissions from engine number 1705 shall not exceed the emission rates as follows:

<u>Pollutant</u>	<u>lbs/hr</u>	tons/yr	s/vr emission factor		
Nitrogen Oxides	10.6	46.3	2.0 g/bhp-hr		
Carbon Monoxide	14.8	64.9	2.8 g/bhp-hr		
VOC (non-methane)	9.0	39.4	1.7 f/bhp-hr		
Particulates (TSP)	0.09	0.4	4.13 lbs/MMscf		
Particulates (PM10)	0.09	0.4	4.13 lbs/MMscf		
Sulfur Dioxide	0.49	2.2	8.27 gr S/100 scf		

[Construction permit AC42-189455]

- 6. Visible emissions shall not exceed 10% opacity from engine no. 1705. [Construction permit AC42-189455]
- 7. See facility-wide condition no. 3 on page 3 for the visible emission limitation for the other emission units.

## Test Methods and Procedures

- 8. Each unit shall demonstrate compliance with its emission limits for each affected pollutant at yearly intervals on or within 60 days prior to September 1, except engine nos. 1706 and 1707, which shall demonstrate compliance prior to permit expiration date.

  [Rules 62-297.310(4)(a)2., and 62-297.310(7)(a)4.a., F.A.C.]
- 9. Compliance with the NOX, SO2, CO, visible emissions, and VOC standards shall be determined by the following reference methods as described in 40 CFR 60, Appendix A (July 1, 1988) and adopted by reference in Rule 62-297, F.A.C.:

a) Method 1	Sample and Velocity Traverse
b) Method 2	Volumetric Flow Rate
c) Method 3A	Gas Analysis
d) Method 7E	Determination of Nitrogen Oxides Emissions from Stationary Sources
e) Method 9	Determination of the Opacity of the Emissions from Stationary Sources
f) Method 10	Determination of Total Gaseous Non-methane Organic Emissions as
	Carbon
<b></b>	

- g) Method 25A Determination of Total Gaseous Organic Concentration using a Flame Ionization Analyzer
- 10. Compliance with the SO2 emission limit can be demonstrated by calculations based on fuel analysis using ASTM D1072-80, D3031-81, D4084-82, or D3246-81, or latest editions, for sulfur content of gaseous fuels.

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11. Initial compliance with the volatile organic compound (VOC) emission limits was demonstrated by EPA Method 25A, thereafter, compliance with the VOC emission limits is assumed, provided the CO allowable emission limit is not exceeded. Test results will be the average of three valid runs.

[Construction permit AC42-189455, operating permit AO42-191302, and Rule 62-297.401, F.A.C.]

- 12. <u>DEP Method 9</u>. The provisions of EPA Method 9 (40CFR60, Appendix A) are adopted by reference with the following exceptions:
- a) EPA Method 9, Section 2.4, Recording Observations. Opacity observations shall be made and recorded by a certified observer at sequential fifteen second intervals during the required period of observation.
- b) EPA Method 9, Section 2.5, Data Reduction. For a set of observations to be acceptable, the observer shall have made and recorded, or verified the recording of, at least 90 percent of the possible individual observations during the required observation period. For single-valued opacity standards (e.g. 20 percent opacity), the test result shall be the highest valid six-minute average for the set of observations taken. For multiple-valued opacity standards (e.g. 20 percent opacity, except that an opacity of 40 percent is permissible for not more than two minutes per hour) opacity shall be computed as follows:
- 1) For the basic part of the standard (i.e., 20 percent opacity) the opacity shall be determined as specified above for a single-valued opacity standard.
- 2) For the short-term average part of the standard, opacity shall be the highest valid short-term average (i.e., two-minute, three-minute average) for the set of observations taken.

In order to be valid, any required average (i.e., a six-minute or two-minute average) shall be based on all of the valid observations in the sequential subset of observations selected, and the selected subset shall contain at least 90 percent of the observations possible for the required averaging time. Each required average shall be calculated by summing the opacity value of each of the valid observations in the subset, dividing this sum by the number of valid observations in the subset, and rounding the result to the nearest whole number. The number of missing observations in the subset shall be indicated in parenthesis after the subset average value.

[Rule 62-297.401, F.A.C.]

13. At least 15 days prior to the date on which each formal compliance test is due to begin, the permittee shall provide written notification of the test to the air compliance section of this office. The notification must include the following information: the date, time and location of each test; the name and telephone number of the facility's contact person who will be responsible for coordinating the test; and the name, company, and telephone number of the person conducting the test.

[Rule 62-297.310(7)(a)9, F.A.C.]

14. Testing of emissions shall be conducted with the emissions unit operation at permitted capacity. Permitted capacity is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impractical to test at permitted capacity, an emissions unit may be tested at less than the minimum permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test load until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. [Rule 62-297.310(2)& (2) (b), F.A.C.]

## Monitoring of Operations

## 15. Determination of Process Variables.

- (a) Required Equipment. The owner or operator of an emissions unit for which compliance tests are required shall install, operate, and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.
- (b) Accuracy of Equipment. Equipment or instruments used to directly or indirectly determine process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value.

[Rule 62-297.310(5), F.A.C.]

## Recordkeeping and Reporting Requirements

16. In order to demonstrate compliance with conditions no. 1, 3, and 5, the permittee shall maintain a log at the facility for a period of at least 5 years from the date the data is recorded. The log at a minimum shall contain the following:

### Monthly

- a) month
- b) consecutive 12 month total of:
  - MMBTU heat input
  - hours of operation
  - emission rates

[Rules 62-4.070(3), and 62-213.440(1)(b)2., F.A.C.]

17. Supporting documentation. The log and documents shall be kept at the facility for at least 5 years and made available to the Department. Daily logs shall be completed within 7 business days and the monthly logs shall be completed by the end of the following month. [Rules 62-4.070(3), and 62-213.440(1)(b)2.b., F.A.C.]

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- 18. A DEP Form No. 62-210.900(5), "Annual Operating Report for Air Pollutant Emitting Facility" including the Emissions Report, shall be completed for each calendar year on or before March 1 of the following year and submitted to the air compliance section of this office. [Rule 62-210.370(3), F.A.C.]
- 19. Reports of the required test report shall be filed with the air compliance section of this office as soon as practical but no later than 45 days after the last test is completed. [Rules 62-297.310(8), F.A.C.]
- 20. At least 180 days prior to the expiration date of this operation permit, the permittee shall submit to this office four air permit applications, DEP Form No. 62-210.900(1). [Rule 62-4.090(1), F.A.C.]

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## STATEMENT OF BASIS

Florida Gas Transmission Company Compressor Station No. 17 Facility ID No.: 0830070 Marion County

Initial Title V Air Operation Permit FINAL Permit No.: 0830070-001-AV

This Title V air operation permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-213. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents, attached hereto or on file with the permitting authority, in accordance with the terms and conditions of this permit.

This facility consists of seven natural gas fired internal combustion engines. Four are rated at 2000 bhp and are manufactured by Cooper-Bessemer, Model LS-8-SG and one is rated at 2400 bhp and is manufactured by Dresser-Rand, Model 412KVSRA. Two engines are used to generate electricity and are 395 bhp each, manufactured by Waukesha, Model LRO. This facility is part of a natural gas pipeline system serving the State of Florida.

The applicable emission limitations are as follows:

- a) E.U. 001, 002, 003, 004, 006, 007 general VE limit per Rule 62-296.320(4)(b)1., F.A.C.
- b) E.U. 005 The maximum allowable emissions from engine number 1705 shall not exceed the emission rates as follows:

Pollutant	<u>lbs/hr</u>	tons/vr	emission factor
Nitrogen Oxides	10.6	46.3	2.0 g/bhp-hr
Carbon Monoxide	14.8	64.9	2.8 g/bhp-h <b>r</b>
VOC (non-methane)	9.0	39.4	1.7 f/bhp-hr
Particulates (TSP)	0.09	0.4	4.13 lbs/MMscf
Particulates (PM10)	0.09	0.4	4.13 lbs/MMscf
Sulfur Dioxide	0.49	2.2	8.27 gr S/100 scf

[Construction permit AC42-189455]

Also included in this permit are miscellaneous exempt emission units and/or activities.

Based on the initial Title V permit application received June 17, 1996, this facility is not a major source of hazardous air pollutants (HAPs).

# Appendix A-1, Abbreviations, Acronyms, Citations, and Identification Numbers (version dated 02/05/97)

## Abbreviations and Acronyms:

°F: Degrees Fahrenheit

BACT: Best Available Control Technology

CFR: Code of Federal Regulations

DEP: State of Florida, Department of Environmental Protection

DARM: Division of Air Resource Management

EPA: United States Environmental Protection Agency

F.A.C.: Florida Administrative Code

F.S.: Florida Statute

ISO: International Standards Organization

LAT: Latitude LONG: Longitude

MMBtu: million British thermal units

MW: Megawatt

ORIS: Office of Regulatory Information Systems

SOA: Specific Operating Agreement UTM: Universal Transverse Mercator

Citations:

The following examples illustrate the methods used in this permit to abbreviate and cite the references of rules, regulations, guidance memorandums, permit numbers, and ID numbers.

# Code of Federal Regulations:

Example: [40 CFR 60.334]

Where: 40 reference to Title 40

CFR reference to Code of Federal Regulations

60 reference to Part 60

60.334 reference to Regulation 60.334

# Florida Administrative Code (F.A.C.) Rules:

Example: [Rule 62-213, F.A.C.]

Where: 62 reference to Title 62

62-213 reference to Chapter 62-213

62-213.205 reference to Rule 62-213.205, F.A.C.

ISO: International Standards Organization refers to those conditions at 288 degrees K, 60 percent relative humidity, and 101.3 kilopascals pressure.

### Identification Numbers:

## Facility Identification (ID) Number:

Example: Facility ID No.: 1050221

## Where:

105 = 3-digit number code identifying the facility is located in Polk

County

0221 = 4-digit number assigned by state database.

## Permit Numbers:

Example: 1050221-002-AV, or

1050221-001-AC

#### Where:

AC = Air Construction Permit

AV = Air Operation Permit (Title V Source)

105 = 3-digit number code identifying the facility is located in Polk

County

0221 = 4-digit number assigned by permit tracking database

001 or 002 = 3-digit sequential project number assigned by permit

tracking database

Example: PSD-FL-185

PA95-01

AC53-208321

#### Where:

PSD = Prevention of Significant Deterioration Permit

PA = Power Plant Siting Act Permit

AC = old Air Construction Permit numbering

## Appendix H-1, Permit History/ID Number Changes

Florida Gas Transmission Company Compressor Station No. 17 FINAL Permit No.: 0830070-001-AV

Facility ID No.: 0830070

## Permit History (for tracking purposes):

E.U.  ID No. Description  -001 I. C. Engine No. 1701	Permit No. AO42-191302	<u>Issue Date</u> 6/11/91	Expiration Date	Extended Date 1, 2	Revised Date(s)
-002 I. C. Engine No. 1702	AO42-191302	6/11/91			
-003 I. C. Engine No. 1703	AO42-191302	6/11/91			
-004 I. C. Engine No. 1704	AO42-191302	6/11/91			
-005 I. C. Engine No. 1705	AC42-189455 (PSD-FL-162)	5/8/91	6/30/93		
-005 I. C. Engine No. 1705	AO42-232109	2/9/94			

(if applicable) ID Number Changes (for tracking purposes):

From: Facility ID No.: N/A

To: Facility ID No.: N/A

## Notes:

- 1 AO permit(s) automatic extension(s) in Rule 62-210.300(2)(a)3.a., F.A.C., effective 03/21/96.
- 2 AC permit(s) automatic extension(s) in Rule 62-213.420(1)(a)4., F.A.C., effective 03/20/96. {Rule 62-213.420(1)(b)2., F.A.C., effective 03/20/96, allows Title V Sources to operate under existing valid permits}

# Appendix I-1, List of Insignificant Emissions Units and/or Activities.

Florida Gas Transmission Company Compressor Station No. 17 FINAL Permit No.: 0830070-001-AV

Facility ID No.: 0830070

The facilities, emissions units, or pollutant-emitting activities listed in Rule 62-210.300(3)(a), F.A.C., Categorical Exemptions, are exempt from the permitting requirements of Chapters 62-210 and 62-4, F.A.C.; provided, however, that exempt emissions units shall be subject to any applicable emission limiting standards and the emissions from exempt emissions units or activities shall be considered in determining the potential emissions of the facility containing such emissions units. Emissions units and pollutant-emitting activities exempt from permitting under Rule 62-210.300(3)(a), F.A.C., shall not be exempt from the permitting requirements of Chapter 62-213, F.A.C., if they are contained within a Title V source; however, such emissions units and activities shall be considered insignificant for Title V purposes provided they also meet the criteria of Rule 62-213.430(6)(b), F.A.C. No emissions unit shall be entitled to an exemption from permitting under Rule 62.210.300(3)(a), F.A.C., if its emissions, in combination with the emissions of other units and activities at the facility, would cause the facility to emit or have the potential to emit any pollutant in such amount as to make the facility a Title V source.

The below listed emissions units and/or activities are hereby exempt pursuant to Rule 62-213.430(6), F.A.C.

## Brief Description of Emissions Units and/or Activities

- 1. Two Emergency Generators a 170 hp unit rated at 1.36 MMBTU/hr and a 200 hp unit rated at 1.61 MMBTU/hr and both are operated less than 500 hrs/yr.
- 2. Air Compressor a 46 hp engine.
- 3. Lube Oil Storage Tanks two horizontal lube oil storage tanks of 10,000 gallons and 3,500 gallons storing an organic liquid having a true vapor pressure of approximately 0.019 psia.
- 4. Used Lube Oil Storage Tank a 90 bbl storage tank used to store used lube oil with a true vapor pressure of approximately 0.019 psia.
- 5. Oily Water Tanks two 210 bbl storage tanks used to store wastewater containing used lube oil.
- 6. Pipeline Condensate Tank a 210 bbl storage tank used to store pipeline condensate. It stores an organic liquid having a Reid vapor pressure of approximately 1.4 psia.
- 7. Diesel Fuel Storage Tank a 250 gallon storage tank used to store diesel fuel.
- 8. Lube Oil Rundown Tank a small tank used to store lube oil during maintenance operations.
- 9. Parts Cleaner a parts cleaner using a cleaning fluid containing naptha.
- 10. Paint Cleaner a paint cleaner using a cleaning fluid containing naptha.
- 11. Blowdown Stacks
- 12. Fugitive Component Leaks emissions from leaks of numerous sources that are valves, flanges, and other components.

Stack Sampling Facilities Provided by the Owner of an Emissions Unit. This section describes the minimum requirements for stack sampling facilities that are necessary to sample point emissions units. Sampling facilities include sampling ports, work platforms, access to work platforms, electrical power, and sampling equipment support. Emissions units must provide these facilities at their expense. All stack sampling facilities must meet any Occupational Safety and Health Administration (OSHA) Safety and Health Standards described in 29 CFR Part 1910, Subparts D and E.

(a) Permanent Test Facilities. The owner or operator of an emissions unit for which a compliance test, other than a visible emissions test, is required on at least an annual basis, shall install and

maintain permanent stack sampling facilities.

- (b) Temporary Test Facilities. The owner or operator of an emissions unit that is not required to conduct a compliance test on at least an annual basis may use permanent or temporary stack sampling facilities. If the owner chooses to use temporary sampling facilities on an emissions unit, and the Department elects to test the unit, such temporary facilities shall be installed on the emissions unit within 5 days of a request by the Department and remain on the emissions unit until the test is completed.
- (c) Sampling Ports.
  - 1. All sampling ports shall have a minimum inside diameter of 3 inches.

2. The ports shall be capable of being sealed when not in use.

- 3. The sampling ports shall be located in the stack at least 2 stack diameters or equivalent diameters downstream and at least 0.5 stack diameter or equivalent diameter upstream from any fan, bend, constriction or other flow disturbance.
- 4. For emissions units for which a complete application to construct has been filed prior to December 1, 1980, at least two sampling ports, 90 degrees apart, shall be installed at each sampling location on all circular stacks that have an outside diameter of 15 feet or less. For stacks with a larger diameter, four sampling ports, each 90 degrees apart, shall be installed. For emissions units for which a complete application to construct is filed on or after December 1, 1980, at least two sampling ports, 90 degrees apart, shall be installed at each sampling location on all circular stacks that have an outside diameter of 10 feet or less. For stacks with larger diameters, four sampling ports, each 90 degrees apart, shall be installed. On horizontal circular ducts, the ports shall be located so that the probe can enter the stack vertically, horizontally or at a 45 degree angle.
- 5. On rectangular ducts, the cross sectional area shall be divided into the number of equal areas in accordance with EPA Method 1. Sampling ports shall be provided which allow access to each sampling point. The ports shall be located so that the probe can be inserted perpendicular to the gas flow.
- (d) Work Platforms.
- 1. Minimum size of the working platform shall be 24 square feet in area. Platforms shall be at least 3 feet wide.
- 2. On circular stacks with 2 sampling ports, the platform shall extend at least 110 degrees around the stack.
- 3. On circular stacks with more than two sampling ports, the work platform shall extend 360 degrees around the stack.
- 4. All platforms shall be equipped with an adequate safety rail (ropes are not acceptable), toeboard, and hinged floor-opening cover if ladder access is used to reach the platform. The safety rail directly in line with the sampling ports shall be removable so that no obstruction exists in an area 14 inches below each sample port and 6 inches on either side of the sampling port.
- (e) Access to Work Platform.
- 1. Ladders to the work platform exceeding 15 feet in length shall have safety cages or fall arresters with a minimum of 3 compatible safety belts available for use by sampling personnel.
  - 2. Walkways over free-fall areas shall be equipped with safety rails and toeboards.

# APPENDIX SS-1, STACK SAMPLING FACILITIES (version dated 10/07/96) (continued)

(f) Electrical Power.

1. A minimum of two 120-volt AC, 20-amp outlets shall be provided at the sampling platform

within 20 feet of each sampling port.

2. If extension cords are used to provide the electrical power, they shall be kept on the plant's property and be available immediately upon request by sampling personnel.

(g) Sampling Equipment Support.

1. A three-quarter inch eyebolt and an angle bracket shall be attached directly above each port

on vertical stacks and above each row of sampling ports on the sides of horizontal ducts.

a. The bracket shall be a standard 3 inch x 3 inch x one-quarter inch equal-legs bracket which is 1 and one-half inches wide. A hole that is one-half inch in diameter shall be drilled through the exact center of the horizontal portion of the bracket. The horizontal portion of the bracket shall be located 14 inches above the centerline of the sampling port.

b. A three-eighth inch bolt which protrudes 2 inches from the stack may be substituted for the required bracket. The bolt shall be located 15 and one-half inches above the centerline of the

sampling port.

- c. The three-quarter inch eyebolt shall be capable of supporting a 500 pound working load. For stacks that are less than 12 feet in diameter, the eyebolt shall be located 48 inches above the horizontal portion of the angle bracket. For stacks that are greater than or equal to 12 feet in diameter, the eyebolt shall be located 60 inches above the horizontal portion of the angle bracket. If the eyebolt is more than 120 inches above the platform, a length of chain shall be attached to it to bring the free end of the chain to within safe reach from the platform.
  - 2. A complete monorail or dualrail arrangement may be substituted for the eyebolt and bracket.
- 3. When the sample ports are located in the top of a horizontal duct, a frame shall be provided above the port to allow the sample probe to be secured during the test.

  [Rule 62-297.310(6), F.A.C.]

# TABLE 297.310-1 CALIBRATION SCHEDULE (version dated 10/07/96)

		<b>\</b>	,
[Note: This table is reference	ed in Rule 62-297.310, F.A.C.]		·
ITEM	MINIMUM CALIBRATION FREQUENCY	REFERENCE INSTRUMENT	TOLERANCE
Liquid in glass thermometer	Annually	ASTM Hg in glass ref. thermometer or equivalent, or thermometric points	+/-2%
Bimetallic thermometer	Quarterly	Calib. liq. in glass thermometer	5 degrees F
Thermocouple	Annually	ASTM Hg in glass ref. thermometer, NBS calibrated reference and potentiometer	5 degrees F
Barometer	Monthly	Hg barometer or NOAA station	+/-1% scale
Pitot Tube	When required or when damaged	By construction or measurements in wind tunnel D greater than 16" and standard pitot tube	See EPA Method 2, Fig. 2-2 & 2-3
Probe Nozzles Bef	ore each Micr	ometer +/-0.00	Ol" mean
	test or when nicked, dented, or corroded		of at least three readings Max. deviation between readings .004"
Dry Gas Meter and Orifice Meter	1. Full Scale: When received, When 5% change observed, Annually 2. One Point: Semiannually	Spirometer or calibrated wet test or dry gas test meter	2%
•	3. Check after each test series	Comparison check	5%

[Note: This attachment includes "canned conditions" developed from the "Trile V Core List."]

(Permitting note: APPENDIX TV-1, TITLE V CONDITIONS, is distributed to the permittee only. Other persons requesting copies of these conditions shall be provided one copy when requested or otherwise appropriate.)

#### Chapter 62-4, F.A.C.

1. Not federally enforceable. General Prohibition. Any stationary installation which will reasonably be expected to be a source of pollution shall not be operated, maintained, or modified without the appropriate and valid permits issued by the Department, unless the source is exempted by Department rule. The Department may issue a permit only after it receives reasonable assurance that the installation will not cause pollution in violation of any of the provisions of Chapter 403, F.S., or the rules promulgated thereunder. A permitted installation may only be operated, maintained, constructed, expanded or modified in a manner that is consistent with the terms of the permit.

[Rule 62-4.030, Florida Administrative Code (F.A.C.); Section 403.087, Florida Statute (F.S.)]

- 2. Not sederally enforceable. Procedure to Obtain Permits; Application.
- (1) Any person desiring to obtain a permit from the Department shall apply on forms prescribed by the Department and shall submit such additional information as the Department by law may require.
- (2) All applications and supporting documents shall be filed in quadruplicate with the Department.
- (3) To ensure protection of public health, safety, and welfare, any construction, modification, or operation of an installation which may be a source of pollution shall be in accordance with sound professional engineering practices pursuant to Chapter 471, F.S. All applications for a Department permit shall be certified by a professional engineer registered in the State of Florida except when the application is for renewal of an air pollution operation permit at a minor facility as defined in Rule 62-210.200, F.A.C., or where professional engineering is not required by Chapter 471, F.S. Where required by Chapter 471 or 492, F.S., applicable portions of permit applications and supporting documents which are submitted to the Department for public record shall be signed and scaled by the professional(s) who prepared or approved them.
- (4) Processing fees for air construction permits shall be in accordance with Rule 62-4.050(4), F.A.C.
- (5)(a) To be considered by the Department, each application must be accompanied by the proper processing fee. The fee shall be paid by check, payable to the Department of Environmental Protection. The fee is non-refundable except as provided in Section 120.60, F.S., and in this section.
- (c) Upon receipt of the proper application fee, the permit processing time requirements of Sections 120.60(2) and 403.0876, F.S., shall begin.
- (d) If the applicant does not submit the required fee within ten days of receipt of written notification, the Department shall—either return the unprocessed application or arrange with the applicant for the pick up of the application.
- (e) If an applicant submits an application fee in excess of the required fee, the permit processing time requirements of Sections 120.60(2) and 403.0876, F.S., shall begin upon receipt, and the Department shall refund to the applicant the amount received in excess of the required fee.
- (6) Any substantial modification to a complete application shall require an additional processing fee determined pursuant to the schedule set forth in Rule 62-4.050, F.A.C., and shall restart the time requirements of Sections 120.60 and 403.0876, F.S. For purposes of this Subsection, the term "substantial modification" shall mean a modification which is reasonably expected to lead to substantially different environmental impacts which require a detailed review.
- (7) Modifications to existing permits proposed by the permittee which require substantial changes in the existing permit or require substantial evaluation by the Department of potential impacts of the proposed modifications shall require the same fee as a new application. [Rule 62-4.050, F.A.C.]
- 3. Standards for Issuing or Denving Permits. Except as provided at Rule 62-213.460, F.A.C., the issuance of a permit does not relieve any person from complying with the requirements of Chapter 403, F.S., or Department rules.

  [Rule 62-4.070(7), F.A.C.]

#### 4. Modification of Permit Conditions.

- (1) For good cause and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions and on application of the permittee the Department may grant additional time. For the purpose of this section, good cause shall include, but not be limited to, any of the following:
  - (a) A showing that an improvement in effluent or emission quality or quantity can be accomplished because of technological advances without unreasonable hardship.
  - (b) A showing that a higher degree of treatment is necessary to effect the intent and purpose of Chapter 403, F.S.
- (c) A showing of any change in the environment or surrounding conditions that requires a modification to conform to applicable air or water quality standards.
  - (e) Adoption or revision of Fiorida Statutes, rules, or standards which require the modification of a permit condition for compliance.
- (2) A permittee may request a modification of a permit by applying to the Department.
- (3) A permittee may request that a permit be extended as a modification of the permit. Such a request must be submitted to the Department in writing before the expiration of the permit. Upon timely submittal of a request for extension, unless the permit automatically expires by statute or rule, the permit will remain in effect until final agency action is taken on the request. For construction permits, an extension shall be granted if the applicant can demonstrate reasonable assurances that, upon completion, the extended permit will comply with the standards and conditions required by applicable regulation. For all other permits, an extension shall be granted if the applicant can demonstrate reasonable assurances that the extended permit will comply with the standards and conditions applicable to the original permit. A permit for which the permit application fee was prorated in accordance with Rule 62-4.050(4X1), F.A.C., shall not be extended. In no event shall a permit be extended or remain in effect longer than the time limits established by statute or rule, [Rule 62-4.080, F.A.C.]
- 5. Renewals. Prior to one hundred eighty (180) days before the expiration of a permit issued pursuant to Chapter 62-213, F.A.C., the permittee shall apply for a renewal of a permit using forms incorporated by reference in the specific rule chapter for that kind of permit. A renewal application shall be timely and sufficient. If the application is submitted prior to 180 days before expiration of the permit, it will be considered timely and sufficient. If the renewal application is submitted at a later date, it will not be considered timely and sufficient unless it is submitted and made complete prior to the expiration of the operation permit. When the application for renewal is timely and sufficient, the existing permit shall remain in effect until the renewal application has been finally acted upon by the Department or, if there is court review of the Department's final agency action, until a later date is required by Section 120.60, F.S., provided that, for renewal of a permit issued pursuant to Chapter 62-213, F.A.C., the applicant complies with the requirements of Rules 62-213.420(1Xb)3, and 4., F.A.C.

[Rule 62-4.090(1), F.A.C.]

## Suspension and Revocation.

- (1) Permits shall be effective until suspended, revoked, surrendered, or expired and shall be subject to the provisions of Chapter 403, F.S., and rules of the Department.
- (2) Failure to comply with pollution control laws and rules shall be grounds for suspension or revocation.
- (3) A permit issued pursuant to Chapter 62-4, F.A.C., shall not become a vested property right in the permittee. The Department may revoke any permit issued by it if it finds that the permit holder or the permit holder's agent:
  - (a) Submitted false or inaccurate information in application or operational reports.
  - (b) Has violated law, Department orders, rules or permit conditions.
  - (c) Has failed to submit operational reports or other information required by Department rules.
  - (d) Has refused lawful inspection under Section 403.091, F.S.

[Rule 62-4.100, F.A.C.]

7. Not federally enforceable. <u>Financial Responsibility</u>. The Department may require an applicant to submit proof of financial responsibility and may require the applicant to post an appropriate bond to guarantee compliance with the law and Department rules. [Rule 62-4.110, F.A.C.]

#### 8. Transfer of Permits.

- (1) Within 30 days after the sale or legal transfer of a permitted facility, an "Application for Transfer of Permit" (DEP Form 62-1.201(1)) must be submitted to the Department. This form must be completed with the notarized signatures of both the permittee and the proposed new permittee.
- (2) The Department shall approve the transfer of a permit unless it determines that the proposed new permittee cannot provide reasonable assurances that conditions of the permit will be met. The determination shall be limited solely to the ability of the new permittee to comply with the conditions of the existing permit, and it shall not concern the adequacy of these permit conditions. If the Department proposes to deny the transfer, it shall provide both the permittee and the proposed new permittee a written objection to such transfer together with notice of a right to request a Chapter 120, F.S., proceeding on such determination.
- (3) Within 30 days of receiving a properly completed Application for Transfer of Permit form, the Department shall issue a final determination. The Department may toll the time for making a determination on the transfer by notifying both the permittee and the proposed new permittee that additional information is required to adequately review the transfer request. Such notification shall be served within 30 days of receipt of an Application for Transfer of Permit form, completed pursuant to Rule 62-4.120(1), F.A.C. If the Department fails to take action to approve or deny the transfer within 30 days of receipt of the completed Application for Transfer of Permit form, or within 30 days of receipt of the last item of timely requested additional information, the transfer shall be deemed approved.
- (4) The permittee is encouraged to apply for a permit transfer prior to the sale or legal transfer of a permitted facility. However, the transfer shall not be effective prior to the sale or legal transfer.
- (5) Until this transfer is approved by the Department, the permittee and any other person constructing, operating, or maintaining the permitted facility shall be liable for compliance with the terms of the permit. The permittee transferring the permit shall remain liable for corrective actions that may be required as a result of any violations occurring prior to the sale or legal transfer of the facility. [Rule 62-4.120, F.A.C.]
- 9. Plant Operation-Problems. If the permittee is temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by hazard of fire, wind or by other cause, the permittee shall immediately notify the Department. Notification shall include pertinent information as to the cause of the problem, and what steps are being taken to correct the problem and to prevent its recurrence, and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with Department rules.

  [Rule 62-4.130, F.A.C.]
- 10. For purposes of notification to the Department pursuant to Rule 62-4.130, F.A.C., Plant Operation-Problems, "immediately" shall mean the same day, if during a workday (i.e., 8:00 a.m. 5:00 p.m.), or the first business day after the incident, excluding weekends and holidays.

[40 CFR 70.6(a)(3)(iii)(B)]

- 11. Not federally enforceable. Review. Failure to request a hearing within 14 days of receipt of notice of proposed or final agency action on a permit application or as otherwise required in Chapter 62-103, F.A.C., shall be deemed a waiver of the right to an administrative hearing.

  [Rule 62-4.150, F.A.C.]
- 12. Permit Conditions. All permits issued by the Department shall include the following general conditions:
- (1) The terms, conditions, requirements, limitations and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
- (2) This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
- (3) As provided in subsections 403.087(6) and 403.722(5), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in this permit.

- (4) This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
- (5) This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of F.S. and Department rules, unless specifically authorized by an order from the Department.
- (6) The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.
- (7) The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at reasonable times, access to the premises where the permitted activity is located or conducted to:
  - (a) Have access to and copy any records that must be kept under conditions of the permit;
  - (b) Inspect the facility, equipment, practices, or operations regulated or required under this permit; and,
- (c) Sample or monitor any substances or parameters at any location reasonable necessary to assure compliance with this permit or Department rules. Reasonable time may depend on the nature of the concern being investigated.
- (8) If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:
  - (a) A description of and cause of noncompliance; and,
- (b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance. The permittee—shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for ——penalties or for revocation of this permit.
- (9) In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the F.S. or Department rules, except where such use is prescribed by Sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.
- (10) The permittee agrees to comply with changes in Department rules and F.S. after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by F.S. or Department rules.
- (11) This permit is transferable only upon Department approval in accordance with Rule 62-4.120, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
- (12) This permit or a copy thereof shall be kept at the work site of the permitted activity.
- (14) The permittee shall comply with the following:
- (a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
- (b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least five (5) years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
  - (c) Records of monitoring information shall include:
    - 1. the date, exact place, and time of sampling or measurements;
    - 2. the person responsible for performing the sampling or measurements;
    - 3. the dates analyses were performed;
    - 4. the person responsible for performing the analyses;
    - 5. the analytical techniques or methods used; and,
    - 6. the results of such analyses.
- (15) When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware the relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

  [Rules 62-4.160 and 62-213.440(1)(b), F.A.C.]

- 13. Construction Permits.
- (1) No person shall construct any installation or facility which will reasonably be expected to be a source of air or water pollution without first applying for and receiving a construction permit from the Department unless exempted by statute or Department rule. In addition to the requirements of Chapter 62-4, F.A.C., applicants for a Department Construction Permit shall submit the following as applicable:
  - (a) A completed application on forms furnished by the Department.
  - (b) An engineering report covering:
    - 1. plant description and operations,
    - 2. types and quantities of all waste material to be generated whether liquid, gaseous or solid,
    - 3. proposed waste control facilities,
    - 4. the treatment objectives,
    - 5. the design criteria on which the control facilities are based, and,
    - 6. other information deemed relevant.

Design criteria submitted pursuant to Rule 62-4.210(1 $\chi$ b)5., F.A.C., shall be based on the results of laboratory and pilot-plant scale studies whenever such studies are warranted. The design efficiencies of the proposed waste treatment facilities and the quantities and types of pollutants in the treated effluents or emissions shall be indicated. Work of this nature shall be subject to the requirements of Chapter 471, F.S. Where confidential records are involved, certain information may be kept confidential pursuant to Section 403.111, F.S.

- (c) The owners' written guarantee to meet the design criteria as accepted by the Department and to abide by Chapter 403, F.S. and the rules of the Department as to the quantities and types of materials to be discharged from the installation. The owner may be required to post an appropriate bood or other equivalent evidence of financial responsibility to guarantee compliance with such conditions in instances where the owner's financial resources are inadequate or proposed control facilities are experimental in nature.
- (2) The construction permit may contain conditions and an expiration date as determined by the Secretary or the Secretary's designee.
- (3) When the Department issues a permit to construct, the permittee shall be allowed a period of time, specified in the permit, to construct, and to operate and test to determine compliance with Chapter 403, F.S., and the rules of the Department and, where applicable, to apply for and receive an operation permit. The Department may require tests and evaluations of the treatment facilities by the permittee at his/her expense.

[Rule 62-4.210, F.A.C.]

14. Not federally enforceable. Operation Permit for New Sources. To properly apply for an operation permit for new sources, the applicant shall submit certification that construction was completed noting any deviations from the conditions in the construction permit and test results where appropriate.

[Rule 62-4.220, F.A.C.]

#### Chapter 62-103, F.A.C.

- 15. Public Notice, Public Participation, and Proposed Agency Action. The permittee shall comply with all of the requirements for public notice, public participation, and proposed agency action pursuant to Rule 62-103.150 and Rule 62-210.350, F.A.C. [Rules 62-103.150, 62-210.350 and 62-213.430(1)(b), F.A.C.]
- 16. <u>Administrative Hearing</u>. The permittee shall comply with all of the requirements for a petition for administrative hearing or waiver of right to administrative proceeding pursuant to Rule 61-103.155, F.A.C.
  [Rule 62-103.155, F.A.C.]

#### Chapter 62-204, F.A.C.

17. Asbestos. This permit does not authorize any demolition or repovation of the facility or its parts or components which involves asbestos removal. This permit does not constitute a waiver of any of the requirements of Chapter 62-257, F.A.C., and 40 CFR Part 61, Subpart M, National Emission Standard for Asbestos, adopted and incorporated by reference in Rule 62-204.800, F.A.C. Compliance with Chapter 62-257, F.A.C., and 40 CFR 61, Subpart M, Section 61.145, is required for any asbestos demolition or renovation at the source.

[40 CFR 61; Rule 62-204.800, F.A.C.; and, Chapter 62-257, F.A.C.]

#### Chapter 62-210, F.A.C.

- 18. Permits Required. The owner or operator of any emissions unit which emits or can reasonably be expected to emit any air pollutant shall obtain an appropriate permit from the Department prior to beginning construction, modification, or initial or continued operation of the emissions unit unless exempted pursuant to Department rule or statute. All emissions limitations, controls, and other requirements imposed by such permits shall be at least as stringent as any applicable limitations and requirements contained in or enforceable under the State Implementation Plan (SIP) or that are otherwise federally enforceable. Except as provided at Rule 62-213.460, F.A.C., issuance of a permit does not relieve the owner or operator of an emissions unit from complying with any applicable requirements, any emission limiting standards or other requirements of the air pollution rules of the Department or any other such requirements under federal, state, or local law.
- (1) Air Construction Permits. An air construction permit shall be obtained by the owner or operator of any proposed new or modified facility or emissions unit prior to the beginning of construction or modification, in accordance with all applicable provisions of Chapters 62-210, 62-212 and 62-4, F.A.C. The construction permit shall be issued for a period of time sufficient to allow construction or modification of the facility or emissions unit and operation while the new or modified facility or emissions unit is conducting tests or otherwise demonstrating initial compliance with the conditions of the construction permit.
- (2) Air Operation Permits. Upon expiration of the air operation permit for any existing facility or emissions unit, subsequent to construction or modification and demonstration of initial compliance with the conditions of the construction permit for any new or modified facility or emissions unit, or as otherwise provided in Chapter 62-210 or Chapter 62-213, the owner or operator of such facility or emissions unit shall obtain a renewal air operation permit, an initial air operation permit, or an administrative correction or revision of an existing air operation permit, whichever is appropriate, in accordance with all applicable provisions of Chapter 62-210, Chapter 62-213, and Chapter 62-4, F.A.C.
  - (a) Minimum Requirements for All Air Operation Permits. At a minimum, a permit issued pursuant to this subsection shall:
  - Specify the manner, nature, volume and frequency of the emissions permitted, and the applicable emission limiting standards or performance standards, if any,
- 2. Require proper operation and maintenance of any pollution control equipment by qualified personnel, where
   applicable in accordance with the provisions of any operation and maintenance plan required by the air pollution rules of
  Department.

the

- 3. Contain an effective date stated in the permit which shall not be earlier than the date final action is taken on the application and be issued for a period, beginning on the effective date, as provided below.
- a. The operation permit for an emissions unit which is in compliance with all applicable rules and in operational condition, and which the owner or operator intends to continue operating, shall be issued or renewed for a five-year period, except that, for Title V sources subject to Rule 62-213.420(1)(a)1., F.A.C., operation permits shall be extended until 60 days after the due date for submittal of the facility's Title V permit application as specified in Rule 62-213.420(1)(a)1., F.A.C.
- b. Except as provided in Rule 62-210.300(2)(a)3.d., F.A.C., the operation permit for an emissions unit which has been shut down for six months or more prior to the expiration date of the current operation permit, shall be renewed for a period not to exceed five years from the date of shutdown, even if the emissions unit is not maintained in operational condition, provided:
  - (i) the owner or operator of the emissions unit demonstrates to the Department that the emissions unit may need to be reactivated and used, or that it is the owner's or operator's intent to apply to the Department for a permit to construct a new emissions unit at the facility before the end of the extension period; and,
  - (ii) the owner or operator of the emissions unit agrees to and is legally prohibited from providing the allowable emission permitted by the renewed permit as an emissions offset to any other person under Rule 62-212.500, F.A.C.; and,
    - (iii) the emissions unit was operating in compliance with all applicable rules as of the time the source was abut down.
- c. Except as provided in Rule 62-210.300(2)(a)3.d., F.A.C., the operation permit for an emissions unit which has been shut down for five years or more prior to the expiration date of the current operation permit shall be renewed for a maximum period not to exceed ten years from the date of shutdown, even if the emissions unit is not maintained in operational condition, provided the conditions given in Rule 62-210.300(2)(a)3.b., F.A.C., are met and the owner or operator demonstrates to the Department that failure to renew the permit would constitute a hardship, which may include economic hardship.

- d. The operation permit for an electric utility generating unit on cold standby or long-term reserve shutdown shall be renewed for a five-year period, and additional five-year periods, even if the unit is not maintained in operational condition, provided the conditions given in Rules 62-210.300(2)(a)3.b.(i) through (iii), F.A.C., are met.
- 4. In the case of an emissions unit permitted pursuant to Rules 62-210.300(2)(a)3.b., c., and d., F.A.C., include reasonable notification and compliance testing requirements for reactivation of such emissions unit and provide that the owner or operator demonstrate to the Department prior to reactivation that such reactivation would not constitute reconstruction pursuant to Rule 62-204.800(7), F.A.C.

[Rules 62-210.300(1) & (2), F.A.C.]

- 19. Not federally enforceable. Notification of Startup. The owner or operator of any emissions unit or facility which has a valid air operation permit and which has been shut down more than one (1) year, shall notify the Department in writing of the intent to start up such emissions unit or facility, a minimum of sixty (60) days prior to the intended startup date.
- (a) The notification shall include the planned startup date, anticipated emission rates or pollutants released, changes to processes or control devices which will result in changes to emission rates, and any other conditions which may differ from the valid outstanding operation permit.
  - (b) If, due to an emergency, a startup date is not known 60 days prior thereto, the owner shall notify the Department as soon as possible after the date of such startup is ascertained.

[Rule 62-210.300(5), F.A.C.]

#### 20. Emissions Unit Reclassification.

- (a) Any emissions unit whose operation permit has been revoked as provided for in Chapter 62-4, F.A.C., shall be deemed permanently shut down for purposes of Rule 62-212.500, F.A.C. Any emissions unit whose permit to operate has expired without timely renewal or transfer may be deemed permanently shut down, provided, however, that no such emissions unit shall be deemed permanently shut down if, within 20 days after receipt of written notice from the Department, the emissions unit owner or operator demonstrates that the permit expiration resulted from inadvertent failure to comply with the requirements of Rule 62-4.090, F.A.C., and that the owner or operator intends to continue the emissions unit in operation, and either submits an application for an air operation permit or complies with permit transfer requirements, if applicable.
- (b) If the owner or operator of an emissions unit which is so permanently shut down, applies to the Department for a permit to reactivate or operate such emissions unit, the emissions unit will be reviewed and permitted as a new emissions unit.

  [Rule 62-210.300(6), F.A.C.]

### 21. Public Notice and Comment.

- (1) Public Notice of Proposed Agency Action.
- (a) Notwithstanding any discretionary public notice requirements contained in Rule 62-103.150(2)(a), F.A.C., a notice of proposed agency action on permit application, where the proposed agency action is to issue the permit, shall be published by applicant for:
  - 1. An air construction permit;
  - An air operation permit permit renewal or permit revision subject to Rule 62-210.300(2)(b), F.A.C., (i.e., a FESOP), except as provided in Rule 62-210.300(2)(b)1.b., F.A.C.; or
  - 3. An air operation permit permit renewal, or permit revision subject to Chapter 62-213, F.A.C., except those permit revisions meeting the requirements of Rule 62-213.412(1), F.A.C.
  - (b) The notice required by Rule 62-210.350(1)(a), F.A.C., shall be published in accordance with all otherwise applicable provisions of Rule 62-103.150, F.A.C.
- (2) Additional Public Notice Requirements for Emissions Units Subject to Prevention of Significant Deterioration or Nonattainment-Area Preconstruction Review.
- (a) Before taking final agency action on a construction permit application for any proposed new or modified facility or emissions unit subject to the preconstruction review requirements of Rule 62-212.400 or 62-212.500, F.A.C., the Department shall comply with all applicable provisions of Rule 62-103.150, F.A.C., and provide an opportunity for public comment which shall include as a minimum the following:
  - 1. A complete file available for public inspection in at least one location in the district affected which includes the information submitted by the owner or operator, exclusive of confidential records under Section 403.111, F.S., and the Department's analysis of the effect of the proposed construction or modification on ambient air quality, including the Department's preliminary determination of whether the permit abould be approved or disapproved;
    - 2. A 30-day period for submittal of public comments, and,

- 3. A notice, by advertisement in a newspaper of general circulation in the country affected, specifying the nature and location of the proposed facility or emissions unit, whether BACT or LAER has been determined, the degree of PSD increment consumption expected, if applicable, and the location of the information specified in paragraph 1, above; and notifying the public of the opportunity for submitting comments and requesting a public hearing.
- (b) The notice provided for in Rule 62-210.350(2Xa)3., F.A.C., shall be prepared by the Department and published by the applicant in accordance with all applicable provisions of Rule 62-103.150, F.A.C., except that the applicant shall cause the notice to be published no later than thirty (30) days prior to final agency action.
- (c) A copy of the notice provided for in Rule 62-210.350(2)(a)3., F.A.C., shall also be sent by the Department to the Regional Office of the U. S. Environmental Protection Agency and to all other state and local officials or agencies having cognizance—over the location of such new or modified facility or emissions unit, including local air pollution control agencies, chief—executives of city or county government, regional land use planning agencies, and any other state, Federal Land Manager, or Indian Governing Body whose lands may be affected by emissions from the new or modified facility or emissions unit.
- (d) A copy of the notice provided for in Rule 62-210.350(2Xa)3., F.A.C., shall be displayed in the appropriate district, branch and local program offices.
  - (e) An opportunity for public bearing shall be provided in accordance with Chapter 120, F.S., and Rule 62-103.150, F.A.C.
- (f) Any public comments received shall be made available for public inspection in the location where the information specified in Rule 62-210.350(2)(a)1., F.A.C., is available and shall be considered by the Department in making a final determination to approve or deny the permit.
- (g) The final determination shall be made available for public inspection at the same location where the information specified in Rule 62-210.350(2)(a)1, F.A.C., was made available.
- (h) For a proposed new or modified emissions unit which would be located within 100 kilometers of any Federal Class I area or whose emissions may affect any Federal Class I area, and which would be subject to the preconstruction review requirements of Rule 62-212.400, F.A.C., or Rule 62-212.500, F.A.C.:
  - The Department shall mail or transmit to the Administrator a copy of the initial application for an air construction permit and notice of every action related to the consideration of the permit application.
  - 2. The Department shall mail or transmit to the Federal Land Manager of each affected Class I area a copy of any written notice of intent to apply for an air construction permit; the initial application for an air construction permit, including all required analyses and demonstrations; any subsequently submitted information related to the application; the preliminary determination and notice of proposed agency action on the permit application; and any petition for an administrative bearing regarding the application or the Department's proposed action. Each such document shall be mailed or transmitted to the Federal Land Manager within fourteen (14) days after its receipt by the Department.
- (3) Additional Public Notice Requirements for Facilities Subject to Operation Permits for Title V Sources.
- (a) Before taking final agency action to issue a new, renewed, or revised air operation permit subject to Chapter 62-213, F.A.C., the Department shall comply with all applicable provisions of Rule 62-103.150, F.A.C., and provide an opportunity for public comment which shall include as a minimum the following:
  - 1. A complete file available for public inspection in at least one location in the district affected which includes the information submitted by the owner or operator, exclusive of confidential records under Section 403.111, F.S.; and,
    - 2. A 30-day period for submittal of public comments.
- (b) The notice provided for in Rule 62-210.350(3)(a), F.A.C., shall be prepared by the Department and published by the applicant in accordance with all applicable provisions of Rule 62-103.150, F.A.C., except that the applicant shall cause the notice to be published no later than thirty (30) days prior to final agency action.
  - (c) The notice shall identify:
    - 1. The facility,
    - 2. The name and address of the office at which processing of the permit occurs;
    - 3. The activity or activities involved in the permit action;
    - 4. The emissions change involved in any permit revision;
  - 5. The name, address, and telephone number of a Department representative from whom interested persons may obtain additional information, including copies of the permit draft, the application, and all relevant supporting materials, including any permit application, compliance plan, permit, monitoring report, and compliance statement required pursuant to Chapter 62-213, F.A.C. (except for information entitled to confidential treatment pursuant to Section 403.111, F.S.), and all other materials available to the Department that are relevant to the permit decision;
    - 6. A brief description of the comment procedures required by Rules 62-103.150 and 62-210.350(3), F.A.C.;
  - 7. The time and place of any hearing that may be held, including a statement of procedure to request a hearing (unless a bearing has already been scheduled); and,

 The procedures by which persons may petition the Administrator to object to the issuance of the proposed permit after expiration of the Administrator's 45-day review period.

[Rule 62-210.350, F.A.C.]

#### 22. Administrative Permit Corrections.

- (1) A facility owner shall notify the Department by letter of minor corrections to information contained in a permit. Such notifications shall include:
  - (a) Typographical errors noted in the permit,
  - (b) Name, address or phone number change from that in the permit,
  - (c) Any other similar minor administrative change at the source; and,
  - (d) A change requiring more frequent monitoring or reporting by the permittee.
  - (e) Changes listed at 40 CFR 72.83(a)(1), (2), (6), (9) and (10), hereby adopted and incorporated by reference, to Title V sources subject to emissions limitations or reductions pursuant to 42 USC ss. 7651-76510;
- (f) Changes listed at 40 CFR 72.83(a)(11), hereby adopted and incorporated by reference, to Title V sources subject to emissions limitations or reductions pursuant to 42 USC ss. 7651-76510, provided the notification is accompanied by a copy of any EPA determination concerning the similarity of the change to those listed at Rule 17-210.360(1)(e).
- (2) Upon receipt of such notifications the Department shall within 60 days correct the permit and provide a corrected copy to the owner,
- (3) For facilities subject to Chapter 62-213, F.A.C., a copy shall be provided to EPA and any approved local air program in the county where the facility or any part of the facility is located.
- (4) The Department shall incorporate requirements resulting from issuance of new or revised construction permits into existing operation permits issued pursuant to Chapter 62-213, F.A.C., if the construction permit revisions incorporate requirements of federally enforceable preconstruction review and if the applicant requests at the time of application that all of the requirements of Rule 62-213.430(1), F.A.C., be complied with in conjunction with the processing of the construction permit application.

  [Rule 62-210.360, F.A.C.]

#### 23. Reports.

- (3) Annual Operating Report for Air Pollutant Emitting Facility.
  - (a) The Annual Operating Report for Air Pollutant Emitting Facility (DEP Form No. 62-210.900(5)) shall be completed each year.
  - (c) The annual operating report shall be submitted to the appropriate Department District or Department approved local air pollution control program office by March 1 of the following year unless otherwise indicated by permit condition or Department request.

[Rule 62-210.370(3), F.A.C.]

- 24. <u>Circumvention.</u> No person shall circumvent any air pollution control device, or allow the emission of air pollutants without the applicable air pollution control device operating properly.

  [Rule 62-210.650, F.A.C.]
- 25. Forms and Instructions. The forms used by the Department in the stationary source control program are adopted and incorporated by reference in this section. The forms are listed by rule number, which is also the form number, with the subject, title and effective date.

  Copies of forms may be obtained by writing to the Department of Environmental Protection, Division of Air Resources Management, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.
- (1) Application for Air Permit Long Form, Form and Instructions.
  - (a) Acid Rain Part (Phase II), Form and Instructions.
    - 1. Repowering Extension Plan, Form and Instructions.
    - 2. New Unit Exemption, Form and Instructions.
    - 3. Retired Unit Exemption, Form and Instructions.
  - (b) Reserved
- (5) Annual Operating Report (AOR) for Air Pollutant Emitting Facility, Form and Instructions. [Rule 62-210.900, F.A.C.]

#### Chapter 62-213, F.A.C.

26. Annual Emissions Fee. Each Title V source permitted to operate in Florida must pay between January 15 and March 1 of each year, upon written notice from the Department, an annual emissions fee in accordance with Rule 62-213.205, F.A.C., and the appropriate form and associated instructions.

[Rules 62-213.205 and 62-213.900(1), F.A.C.]

27. <u>Annual Emissions Fee.</u> Failure to pay timely any required annual emissions fee, penalty, or interest constitutes grounds for permit revocation pursuant to Rule 62-4.100, F.A.C. [Rule 62-213.205(1Xg), F.A.C.]

28. <u>Armual Emissions Fee.</u> Any documentation of actual bours of operation, actual material or heat input, actual production amount, or actual emissions used to calculate the annual emissions fee shall be retained by the owner for a minimum of five (5) years and shall be made available to the Department upon request.

[Rule 62-213.205(1)(1), F.A.C.]

- 29. Annual Emissions Fee. DEP Form 62-213.900(1), F.A.C., "Major Air Pollution Source Annual Emissions Fee Form", must be completed by the permittee and submitted with the annual emissions fee.

  [Rule 62-213.205(4), F.A.C.]
- 30. Air Operation Permit Fees. After December 31, 1992, no permit application processing fee, renewal fee, modification fee or amendment fee is required for an operation permit for a Title V source.

  [Rule 62-213.205(5), F.A.C.]
- 31. Permits and Permit Revisions Required. All Title V sources are subject to the permit requirements of Chapter 62-213, F.A.C. [Rule 62-213.400, F.A.C.]
- No Title V source may operate except in compliance with Chapter 62-213, F.A.C.
   [Rule 62-213.400(1), F.A.C.]
- 33. Changes Without Permit Revision. Title V sources having a valid permit issued pursuant to Chapter 62-213, F.A.C., may make the following changes without permit revision, provided that sources shall maintain source logs or records to verify periods of operation in each alternative method of operation:
- (1) Permitted sources may change among those alternative methods of operation allowed by the source's permit as provided by the terms of the permit.
- (2) Permitted sources may implement the terms or conditions of a new or revised construction permit if;
  - (a) The application for construction permit complied with the requirements of Rule 62-213.420(3) and (4), F.A.C.;
  - (b) The terms or conditions were subject to federally enforceable preconstruction review pursuant to Chapter 62-212, F.A.C.; and,
- (c) The new or revised construction permit was issued after the Department and the applicant complied with all the requirements of Rule 62-213.430(1), F.A.C.;
- (3) A permitted source may implement operating changes after the source submits any forms required by any applicable requirement and provides the Department and EPA with at least 7 days written notice prior to implementation. The source and the Department shall attach each notice to the relevant permit;
- (a) The written notice shall include the date on which the change will occur, and a description of the change within the permitted source, the pollutants emitted and any change in emissions, and any term or condition becoming applicable or no longer applicable as a result of the change;
  - (b) The permit shield described in Rule 62-213.460, F.A.C., shall not apply to such changes;
- (4) Permitted sources may implement changes involving modes of operation only in accordance with Rule 62-213.415, F.A.C. [Rule 62-213.410, F.A.C.]

#### 34. Immediate Implementation Pending Revision Process.

- (1) Those permitted Title V sources making any change that constitutes a modification pursuant to paragraph (a) of the definition of modification at Rule 62-210.200, F.A.C., but which would not constitute a modification pursuant to paragraph (b) of the same definition, may implement such change prior to final issuance of a permit revision in accordance with Rule 62-213.412, F.A.C., provided the change:
  - (a) Does not violate any applicable requirement,
  - (b) Does not contravene any permit term or condition for monitoring, testing, recordkeeping or reporting, or any compliance certification requirement;
  - (c) Does not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination of ambient impacts, or a visibility or increment analysis under the provisions of Chapter 62-212 or 62-296, F.A.C.:
- (d) Does not seek to establish or change a permit term or condition for which there is no corresponding underlying applicable requirement and that the source has assumed to avoid an applicable requirement to which the source would otherwise be subject including any federally enforceable emissions cap or federally enforceable alternative emissions limit.
- (2) A Title V source may immediately implement such changes after they have been incorporated into the terms and conditions of a new or revised construction permit issued pursuant to Chapter 62-212, F.A.C., and after the source provides to EPA, the Department, each affected state and any approved local air program having geographic jurisdiction over the source, a copy of the source's application for operation permit revision. The Title V source may conform its application for construction permit to include all information required by Rule 62-213.420, F.A.C., in lieu of submitting separate application forms.
- (3) The Department shall process the application for operation permit revision in accordance with the provisions of Chapter 62-213, F.A.C., except that the Department shall issue a draft permit revision or a determination to deny the revision within 60 days of receipt of a complete application for operation permit revision or, if the Title V source has submitted a construction permit application conforming to the requirements of Rule 62-213.420, F.A.C., the Department shall issue a draft permit or a determination to deny the revision at the same time the Department issues its determination on issuance or denial of the construction permit application. The Department shall not take final action until all the requirements of Rule 62-213.430(1)(a), (c), (d), and (e), F.A.C., have been complied with.
- (4) Pending final action on the operation permit revision application, the source shall implement the changes in accordance with the terms and conditions of the source's new or revised construction permit.
- (5). The permit shield described in Rule 62-213.460, F.A.C., shall not apply to such changes until after the Department takes final action to issue the operation permit revision.
- (6) If the Department denies the source's application for operation permit revision, the source shall cease implementation of the proposed changes.

[Rule 62-213.412, F.A.C.]

#### 35. Permit Applications.

- (1) Duty to Apply. For each Title V source, the owner or operator shall submit a timely and complete permit application in compliance with the requirements of Rules 62-213.420, 62-4.050(1) & (2), and 62-210.900, F.A.C.
  - (a) Timely Application.
    - 3. For purposes of permit renewal, a timely application is one that is submitted in accordance with Rule 62-4.090, F.A.C.
  - (b) Complete Application.
  - 1. Any applicant for a Title V permit, permit revision or permit renewal must submit an application on DEP Form No. 62-210.900(1), which must include all the information specified by Rule 62-213.420(3), F.A.C., except that an application for permit revision must contain only that information related to the proposed change. The applicant shall include information concerning fugitive emissions and stack emissions in the application. Each application for permit, permit revision or permit renewal shall be certified by a responsible official in accordance with Rule 62-213.420(4), F.A.C.
  - 2. For those applicants submitting initial permit applications pursuant to Rule 62-213.420(1)(a)1., F.A.C., a complete application shall be an application that substantially addresses all the information required by the application form number 62-210.900(1), and such applications shall be deemed complete within sixty days of receipt of a signed and certified application unless the Department notifies the applicant of incompleteness within that time. For all other applicants, the applications shall be deemed complete sixty days after receipt, unless the Department, within sixty days after receipt of a signed application for permit, permit revision or permit renewal, requests additional documentation or information needed to process the application. An applicant making timely and complete application for permit, or timely application for permit renewal as described by Rule 62-4.090(1), F.A.C., shall continue to operate the source.

under the authority and provisions of any existing valid permit or Florida Electrical Power Plant Siting Certification, provided the applicant complies with all the provisions of Rules 62-213.420(1)(b)3, and 4, F.A.C. Failure of the Department to request additional information within sixty days of a properly signed application shall not impair the Department's ability to request additional information pursuant to Rules 62-213.420(1)(b)3, and 4, F.A.C.

- 3. For those permit applications submitted pursuant to the provisions of Rule 62-213.420(1)(a)1., F.A.C., the Department shall notify the applicant if the Department becomes aware at any time during processing of the application that the application contains incorrect or incomplete information. The applicant shall submit the corrected or supplementary information to the Department within ninety days unless the applicant has requested and been granted additional time to submit the information. Failure of an applicant to submit corrected or supplementary information requested by the Department within ninety days or such additional time as requested and granted shall render the application incomplete.
- 4. For all applications other than those addressed at Rule 62-213.420(1)(b)3., F.A.C., should the Department become aware, during processing of any application that the application contains incorrect information, or should the Department become aware, as a result of comment from an affected State, an approved local air program, EPA, or the public that additional information is needed to evaluate the application, the Department shall notify the applicant within 30 days. When an applicant becomes aware that an application contains incorrect or incomplete information, the applicant shall submit the corrected or supplementary information to the Department. If the Department notifies an applicant that corrected or supplementary information is necessary to process the permit, and requests a response, the applicant shall provide the information to the Department within ninety days of the Department request unless the applicant has requested and been granted additional time to submit the information or, the applicant shall, within ninety days, submit a written request that the Department process the application without the information. Failure of an applicant to submit corrected or supplementary information requested by the Department within ninety days, or such additional time as requested and granted, or to demand in writing within ninety days that the application be processed without the information shall render the application incomplete. Nothing in this section shall limit any other remedies available to the Department.

[Rules 62-213.420(1)(a)3. and 62-213.420(1)(b)1, 2, 3. & 4, F.A.C.]

- 36. Confidential Information. Whenever an applicant submits information under a claim of confidentiality pursuant to Section 403.111, F.S., the applicant shall also submit a copy of all such information and claim directly to EPA.

  [Rule 62-213.420(2), F.A.C.]
- 37. Standard Application Form and Required Information. Applications shall be submitted under Chapter 62-213, F.A.C., on forms provided by the Department and adopted by reference in Rule 62-210.900(1), F.A.C. The information as described in Rule 62-210.900(1), F.A.C., shall be included for the Title V source and each emissions unit. An application must include information sufficient to determine all applicable requirements for the Title V source and each emissions unit and to evaluate a fee amount pursuant to Rule 62-213.205, F.A.C.
  [Rule 62-213.420(3), F.A.C.]
- 38. Certification by Responsible Official (RO). In addition to the professional engineering certification required for applications by Rule 62-4.050(3), F.A.C., any application form, report, compliance statement, compliance plan and compliance schedule submitted pursuant to Chapter 62-213, F.A.C., shall contain a certification signed by a responsible official that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

  [Rule 62-213.420(4), F.A.C.]
- 39. a Permit Renewal and Expiration. Permits being renewed are subject to the same requirements that apply to permit issuance at the time of application for renewal. Permit renewal applications shall contain that information identified in Rules 62- 210.900(1) and 62-213.420(3), F.A.C. Unless a Title V source submits a timely application for permit renewal in accordance with the requirements of Rule 62-4.090(1), F.A.C., the existing permit shall expire and the source's right to operate shall terminate.
- b. <u>Permit Revision Procedures.</u> Permit revisions shall meet all requirements of Chapter 62-213, F.A.C., including those for content of applications, public participation, review by approved local programs and affected states, and review by EPA, as they apply to permit issuance and renewal, except that permit revisions for those activities implemented pursuant to Rule 62- 213.412, F.A.C., need not meet the requirements of Rule 62-213.430(1)(b), F.A.C. The Department shall require permit revision in accordance with the provisions of Rule 62-4.080, F.A.C., and 40 CFR 70.7(f), whenever any source becomes

subject to any condition listed at 40 CFR 70.7(f)(1), hereby adopted and incorporated by reference. The below requirements from 40 CFR 70.7(f) are adopted and incorporated by reference in Rule 62-213.430(4), F.A.C.:

- a 40 CFR 70.7(f): Reopening for Cause.
- (1) This section contains provisions from 40 CFR 70.7(f) that specify the conditions under which a Title V permit shall be reopened prior to the expiration of the permit. A Title V permit shall be reopened and revised under any of the following circumstances:
- (i) Additional applicable requirements under the Act become applicable to a major Part 70 source with a remaining permit term of 3 or more years. Such a reopening shall be completed not later than 18 months after promulgation of the applicable requirement. No such reopening is required if the effective date of the requirement is later than the date on which the permit is due to expire, unless the original permit or any of its terms and conditions has been extended pursuant to 40 CFR 70.4(b)(10)(i) or (ii).
- (ii) Additional requirements (including excess emissions requirements) become applicable to an affected source under the acid rain program. Upon approved by the Administrator, excess emissions offset plans shall be deemed to be incorporated into the permit.
- (iii) The permitting authority or EPA determines that the permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of the permit.
- (iv) The Administrator or the permitting authority determines that the permit must be revised or revoked to assure compliance with the applicable requirements.
- (2) Proceedings to reopen and issue a permit shall follow the same procedures as apply to initial permit issuance and shall affect only those parts of the permit for which cause to reopen exists. Such reopening shall be made as expeditiously as practicable.
- (3) Reopenings under 40 CFR 70.7(f)(1) shall not be initiated before a notice of such intent is provided to the Part 70 source by the permitting authority at least 30 days in advance of the date that the permit is to be reopened, except that the permitting may provide a shorter time period in the case of an emergency.

  [Rules 62-213.430(3) & (4), F.A.C.; and, 40 CFR 70.7(f)]

#### 40. Insignificant Emissions Units or Pollutant-Emitting Activities.

- (a) All requests for determination of insignificant emissions units or activities made pursuant to Rule 62-213.420(3 xm), F.A.C., shall be processed in conjunction with the permit, permit renewal or permit revision application submitted pursuant to Chapter 62-213, F.A.C. Insignificant emissions units or activities shall be approved by the Department consistent with the provisions of Rule 62-4.040(1)(b), F.A.C. Emissions units or activities which are added to a Title V source after issuance of a permit under Chapter 62-213, F.A.C., shall be incorporated into the permit at its next renewal, provided such emissions units or activities have been exempted from the requirement to obtain an air construction permit and also qualify as insignificant pursuant to Rule 62-213.430(6), F.A.C.
  - (b) An emissions unit or activity shall be considered insignificant if:
    - Such unit or activity would be subject to no unit-specific applicable requirement;
  - 2. Such unit or activity, in combination with other units or activities proposed as insignificant, would not cause the facility to exceed any major source threshold(s) as defined in Rule 62-213.420(3)(c)1., F.A.C., unless it is acknowledged in the permit application that such units or activities would cause the facility to exceed such threshold(s); and
    - 3. Such unit or activity would not emit or have the potential to emit:
      - a. 500 pounds per year or more of lead and lead compounds expressed as lead;
      - b. 1,000 pounds per year or more of any hazardous air pollutant;
      - c. 2,500 pounds per year or more of total hazardous air pollutants; or
      - d. 5.0 tons per year or more of any other regulated pollutant.

[Rule 62-213.430(6), F.A.C.]

- 41. Permit Duration. Operation permits for Title V sources may not be extended as provided in Rule 62-4.080(3), F.A.C., if such extension will result in a permit term greater than five (5) years.

  [Rule 62-213.440(1)(a), F.A.C.]
- 42. Monitoring Information. All records of monitoring information shall specify the date, place, and time of sampling or measurement and the operating conditions at the time of sampling or measurement, the date(s) analyses were performed, the company or entity that performed the analyses, the analytical techniques or methods used, and the results of such analyses.

  [Rule 62-213.440(1)(b)2.a., F.A.C.]

- 43. Retention of Records. Retention of records of all monitoring data and support information shall be for a period of at least 5 years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. [Rule 62-213.440(1)(b)2.b., F.A.C.]
- 44. Monitoring Reports. The permittee shall submit reports of any required monitoring at least every six (6) months. All instances of deviations from permit requirements must be clearly identified in such reports.

  [Rule 62-213.440(1)(b)3.a., F.A.C.]
- 45. <u>Deviation from Fermit Requirements Reports.</u> The permittee shall report in accordance with the requirements of Rules 62-210.700(6) and 62-4.130, F.A.C., any deviations from permit requirements, including those attributable to upset conditions as defined in the permit. Reports shall include the probable cause of such deviations, and any corrective actions or preventive measures taken.

  [Rule 62-213.440(1)(b)3.b., F.A.C.]
- 46. Reports. All reports shall be accompanied by a certification by a responsible official, pursuant to Rule 62-213.420(4), F.A.C. [Rule 62-213.440(1)(b)3.c, F.A.C.]
- 47. If any portion of the final permit is invalidated, the remainder of the permit shall remain in effect, [Rule 62-213.440(1)(d)], F.A.C.]
- 48. It shall not be a defense for a permittee in an enforcement action that maintaining compliance with any permit condition would necessitate having of or reduction of the source activity.

  [Rule 62-213.440(1)(d)3, F.A.C.]
- 49. A Title V source shall comply with all the terms and conditions of the existing permit until the Department has taken final action on any permit renewal or any requested permit revision, except as provided at Rule 62-213.412(2), F.A.C.
  [Rule 62-213.440(1)(4)4, F.A.C.]
- 50. A situation arising from sudden and unforeseeable events beyond the control of the source which causes an exceedance of a technology-based emissions limitation because of unavoidable increases in emissions attributable to the situation and which requires immediate corrective action to restore normal operation, shall be an affirmative defense to an enforcement action in accordance with the provisions and requirements of 40 CFR 70.6(g)(2) and (3), hereby adopted and incorporated by reference.

  [Rule 62-213.440(1)(d)5., F.A.C.]
- 52. Statement of Compliance. The permittee shall submit a statement of compliance with all terms and conditions of the permit. Such statement shall be submitted to the Department and EPA annually, or more frequently if specified by Rule 62-213.440(2), F.A.C., or by any other applicable requirement. The statement of compliance shall include the identity of each term or condition of the permit for which each unit has remained in compliance during the period covered by the statement. The statement shall include identification of all methods used to demonstrate compliance and identification of each term or condition of the permit for which any unit has not remained in compliance during the period covered by the statement. For each term or condition for which the source has not remained in compliance during the period covered by the statement, the statement shall also identify each unit not in compliance and each term and condition with which the unit was not in compliance and state the inclusive dates that the source was not in compliance, the actions taken to achieve compliance and the method used to demonstrate compliance. Such statement shall be accompanied by a certification by a responsible official, in accordance with Rule 62-213.420(4), F.A.C.

  [Rule 62-213.440(3), F.A.C.]

53. Permit Shield. Except as provided in Chapter 62-213, F.A.C., compliance with the terms and conditions of a permit issued pursuant to Chapter 62-213, F.A.C., shall be deemed compliance with any applicable requirements in effect as of the date of permit issuance, provided that the source included such applicable requirements in the permit application. Nothing in Rule 62-213.460, F.A.C., or in any permit shall alter or affect the ability of EPA or the Department to deal with an emergency, the liability of an owner or operator of a source for any violation of applicable requirements prior to or at the time of permit issuance, or the requirements of the Federal Acid Rain Program.

[Rule 62-213.460, F.A.C.]

54. Forms and Instructions. The forms used by the Department in the Title V source operation program are adopted and incorporated by reference in Rule 62-213.900, F.A.C. The form is listed by rule number, which is also the form number, and with the subject, title, and effective date. Copies of forms may be obtained by writing to the Department of Environmental Protection, Division of Air Resources Management, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, or by contacting the appropriate permitting authority.

(1) Major Air Pollution Source Annual Emissions Fee (AEF) Form.

[Rule 62-213.900(1), F.A.C.]

#### Chapter 62-256, F.A.C.

55. Not federally enforceable. Open Burning. This permit does not authorize any open burning nor does it constitute any waiver of the requirements of Chapter 62-256, F.A.C., Source shall comply with Chapter 62-256, F.A.C., for any open burning at the source. [Chapter 62-256, F.A.C.]

#### Chapter 62-281, F.A.C.

- 56. Refrigerant Requirements. Any facility having refrigeration equipment, including air conditioning equipment, which uses a Class I or II substance (listed at 40 CFR 82, Subpart A, Appendices A and B), and any facility which maintains, services, or repairs motor vehicles using a Class I or Class II substance as refrigerant must comply with all requirements of 40 CFR 82, Subparts B and F, and with Rule 62-281.100, F.A.C. Those requirements include the following restrictions:
- (1) Any facility having any refrigeration equipment normally containing 50 (fifty) pounds of refrigerant, or more, must keep servicing records documenting the date and type of all service and the quantity of any refrigerant added pursuant to 40 CFR 82.166;
- (2) No person repairing or servicing a motor vehicle may perform any service on a motor vehicle air conditioner (MVAC) involving the refrigerant for such air conditioner unless the person has been properly trained and certified as provided at 40 CFR 82.34 and 40 CFR 82.40, and properly uses equipment approved pursuant to 40 CFR 82.36 and 40 CFR 82.38, and complies with 40 CFR 82.42;
- (3) No person may sell or distribute, or offer for sale or distribution, any substance listed as a Class I or Class II substance at 40 CFR 82, Subpart A, Appendices A and B, except in compliance with Rule 62-281.100, F.A.C., and 40 CFR 82.34(b), 40 CFR 82.42, and/or 40 CFR 82.166;
- (4) No person maintaining, servicing, repairing, or disposing of appliances may knowingly vent or otherwise release into the atmosphere any Class II substance used as a refrigerant in such equipment and no other person may open appliances (except MVACs as defined at 40 CFR 82.152) for service, maintenance or repair unless the person has been properly trained and certified pursuant to 40 CFR 82.161 and unless the person uses equipment certified for that type of appliance pursuant to 40 CFR 82.158 and unless the person observes the practices set forth at 40 CFR 82.156 and 40 CFR 82.166;
- (5) No person may dispose of appliances (except small appliances, as defined at 40 CFR 82.152) without using equipment certified for that type of appliance pursuant to 40 CFR 82.158 and without observing the practices set forth at 40 CFR 82.156 and 40 CFR 82.166;
- (6) No person may recover refrigerant from small appliances, MVACs and MVAC-like appliances (as defined at 40 CFR 82.152), except in compliance with the requirements of 40 CFR 82, Subpart F.
- [40 CFR 82; and, Chapter 62-281, F.A.C. (Chapter 62-281, F.A.C., is not federally enforceable)]

#### Chapter 62-296, F.A.C.

- 57. Not federally enforceable until SIP approved. <u>Industrial Commercial and Municipal Open Burning Prohibited</u>. Open burning in connection with industrial, commercial, or municipal operations is prohibited, except when:
  - (a) Open burning is determined by the Department to be the only feasible method of operation and is authorized by an air permit issued pursuant to Chapter 62-210 or 62-213, F.A.C.; or
  - (b) An emergency exists which requires immediate action to protect human bealth and safety, or
- (c) A county or municipality would use a portable air curtain incinerator to burn yard trash generated by a burnicane, tornado, fire or other disaster and the air curtain incinerator would otherwise be operated in accordance with the permitting exemption criteria of Rule 62-210.300(3), F.A.C.

[Rule 62-296.320(3), F.A.C.]

#### 58. Unconfined Emissions of Particulate Matter.

(4)(c)1. No person shall cause, let, permit, suffer or allow the emissions of unconfined particulate matter from any emissions unit 

i whatsoever, including but not limited to, vehicular movement, transportation of materials, construction, alteration, demolition or wrecking,

or industrially related activities such as loading, unloading storing or handling, without taking reasonable precautions to prevent such 
emission.

- 3. Reasonable precautions may include, but shall not be limited to the following:
  - a. Paving and maintenance of roads, parking areas and yards,
- Application of water or elemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing.
- Application of asphalt, water, oil, chemicals or other dust suppressants to unpaved roads, yards, open stock piles and similar emissions units.
- d. Removal of particulate matter from roads and other paved areas under the control of the owner or operator of the emissions unit to prevent recotrainment, and from buildings or work areas to prevent particulate from becoming airborne.
  - e. Landscaping or planting of vegetation.
  - f. Use of boods, fans, filters, and similar equipment to contain, capture and/or vent particulate matter.
  - g. Confining abrasive blasting where possible.
  - h. Enclosure or covering of conveyor systems.
- 4. In determining what constitutes reasonable precautions for a particular facility, the Department shall consider the cost of the control technique or work practice, the environmental impacts of the technique or practice, and the degree of reduction of emissions expected from a particular technique or practice.

[Rules 62-296.320(4)(c)1., 3., & 4. F.A.C.]

**Summary Test Report for Modified 1205** 

Table 3: Unit 1205 Post-Modification

riga Gas Transmission rigination Station No. 12

or Memon on Hwy 191, Senta Rosa County, FL

oper-Bessemer LSGS Compressor Engine

2000 bbp @

chesicisms: JT, GM	330 rpm			
st Run No.	1205-C-7	1205-C-8	1205-C-9	
xto	4/26/00	4/26/00	4/26/00	
art Time	20:52	22:05	23:16	
op Time	21:52	23:05	00:29	
gine/Compressor Operation	는 1년 전략 1월 14 kg	1 12 14 14 15 15 15 15 15 15 15 15 15 15 15 15 15		Averages
gine Load (bhp, measured at the compressor)	1905	1905	1905	1905
A Horsepower (blip, based upon fuel torque)	2072	2081	2088	2080
gine Speed (rpm)	330	329	329	329
rque (%, full load = 2000 bhp at 330 rpm)	104	104	105	104
	24.0	24.0	24.0	
aition Timing (°BTDC)	10.7	10.9 –	10.9	10.8
ir Manifold Pressure ("Hg)	80	80	80	80
ir Manifold Temperature (°F)	, S	9	9	9
net Manifold Pressure (psig)	694.0	695.0	696.0	695
ation Suction Pressure (psig)	67	67	67	67
ation Suction Temperature (°F)	•	943.0	945.0	943.3
xtion Discharge Pressure (palg)	942.0	943.0 112	112	112.0
nit Discharge Temperature (*F)	112			112.0
cading Step Number	5	5	5	122.0
impressor Throughput (MMSCFD)	122	122	122	
		ALTONOMY SEEDING		
el Heating Value (Btu/SCF, HHV)	1027.0	1027.0	1027.0	1027.0
al Specific Gravity	0.5800	0.5800	0.5800	0.5800
2 "Fd-factor" (DSCFex/MMBtu @ 0% excess air)	8637	8637	8637	8637
D2 "Rc-factor" (DSCFex/MMBtu @ 0% excess air )	1025	1025	1025	1025
sat Input (MMBtu/hr)	15	15	15	15
ake-specific Fuel Consumption (Btu/bhp-hr)	7627.68	7663.25	7702.77	7664.57
ablent Conditions				
mospheric Pressure ( "Hg)	29.91	29.91	29.88	29.90
emperature (°F): Dry bulb	59.0	57.0	55.0	57.0
(°F): Wet bulb	55.0	54.0	52.0	53.7
midity (lbs moisture/lb air)	0.0082	0.0081	0.0075	0.0079
Samuel Land of the Control of the Co		<b>可是是基础。</b> 在2000		<b>通用的表现</b>
OX (ppmv, dry basis)	526.2	485.8	488.7	500.2
) (ppmv, dry basis)	287.3	278.2	271.5	279.0
2 (% volume, dry basis)	10.6	10.6	10.7	10.6
)2 (% volume, dry basis)	5.72	5.65	5.64	5.67
AC (ppmv)	675.7	- 646.5	673.7	665.3
OC (ppmv as % of THC by weight from fuel gas analysis)	12.63	12.08	12.59	12.43
) (fuel factor, range = 1.600-1.836 for NG)	1.81	1.82	1.81	1.81
zek Weldinetric Flow Rules		A. P. 特别的基本。1976年		
a Pitot Tube (SCFH, dry basis)	2.83E+05	2.80E+05	2.85E+05	2.12E+05
1 O2 "F-factor" (SCFH, dry basis)	2.53E+05	2.56B+05	2.60E+05	2.18E+05
a CO2 "R-factor" (SCFH, dry basis)	2.61E+05	2.65E+05	2.67E+05	2.19E+05
Later Enterior Direc (Vir pitot mbo)		<b>新华州市华</b> 华岛	中国的1967年1969	Control of the state of the sta
OX (lbs/hr)	17.8	16.2	16.6	16.9
) (lbe/br)	5.92	5.66	5.63	5.73
C (Ibs/hr)	0.409	0.387	0.411	0.402
DX (tons/yr)	78.0	71.1	72.9	74.0
) (tons/yr)	25.9	24.8	24.6	25.1
	1.79	1.69	1.80	1.76
C (tons/yr)	4.24	3.87	3.97	4.03
X (g/bhp-hr)	1.41	1.35	1.34	1.37
) (g/bhp-hr)			0.10	0.10
DC (g/bhp-hr)	0.10	0.09	0.10	4.10