

Florida Gas Transmission Company

Phase V Expansion Project

Compressor Station No. 15

**APPLICATION
For
AIR CONSTRUCTION
PERMIT**

June 2001



Florida Gas Transmission Company

Capital Projects Field Office, 111 Kelsey Lane, Ste. A., Tampa, FL 33619
813.655.7441 / 800.381.1477

June 26, 2001

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

RECEIVED

JUL 03 2001

BUREAU OF AIR REGULATION

Reference: Facility: 1230034
Compressor Station No. 15, Perry, Taylor County

Dear Mr. Fancy:

Subject: Application for Air Construction Permit

Florida Gas Transmission Company (FGT) is proposing to install a new Cooper-Rolls 501-KC7 compressor turbine and to increase the horsepower of an existing turbine at the above referenced facility. The facility is a major source under New Source Review definitions; however, the proposed modifications do not result in emissions that are significant under Prevention of Significant Deterioration requirements. Therefore, a state only construction permit is required.

Enclosed is an Application 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

CC: James Alexander, Phase V w/o attachments
Dan Pribble, w/o attachments
Jim Thompson, Phase V
Jake Krautsch, FGT
V. Duane Pierce, Ph.D., AQMcS, LLC
Larry Parrish, Compressor Station No. 15

Florida Gas Transmission Company

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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 Perry in Taylor County, Florida (Compressor Station No. 15). 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. 15 is located in Taylor County, Florida, on Pisgah Road approximately 1 mile east of U.S. Highway 19. Figure 1-1 shows the location of the existing compressor station.

The proposed expansion at this location consists of the addition of one 7,222 brake horsepower (bhp), natural-gas-fired, turbine compressor engine, the upgrading of an existing turbine from 12,600 bhp to 13,180 bhp and the addition of a new 670 bhp natural gas-fired emergency generator. The proposed new engine is a Cooper-Rolls 501-KC7 DLE equipped with dry low NO_x (oxides of nitrogen) combustion. The existing compressor turbine to be upgraded is a Solar Mars 90 T-13000S equipped with dry low NO_x (oxides of nitrogen) combustion. These compressor engines will be used solely for transporting natural gas by pipeline for distribution to markets in Florida.

Under current federal and state air quality regulations, the proposed modification will constitute a minor modification of an existing major source. Based on the projected annual emission rates, there will be no PSD (Prevention of Significant Deterioration) significant increase in any emissions.

Engineering designs for the proposed expansion project include selection of an engine incorporating dry low NO_x combustion technology. Dry low NO_x technology for control of NO_x emissions would represent Best Available Control Technology (BACT) for the proposed turbine engine under PSD requirements.

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This narrative contains three additional sections. Descriptions of the existing operation at FGT's Compressor Station No.15, the proposed new engines and the emergency generator replacement 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 and Attachment D contains emission calculations.

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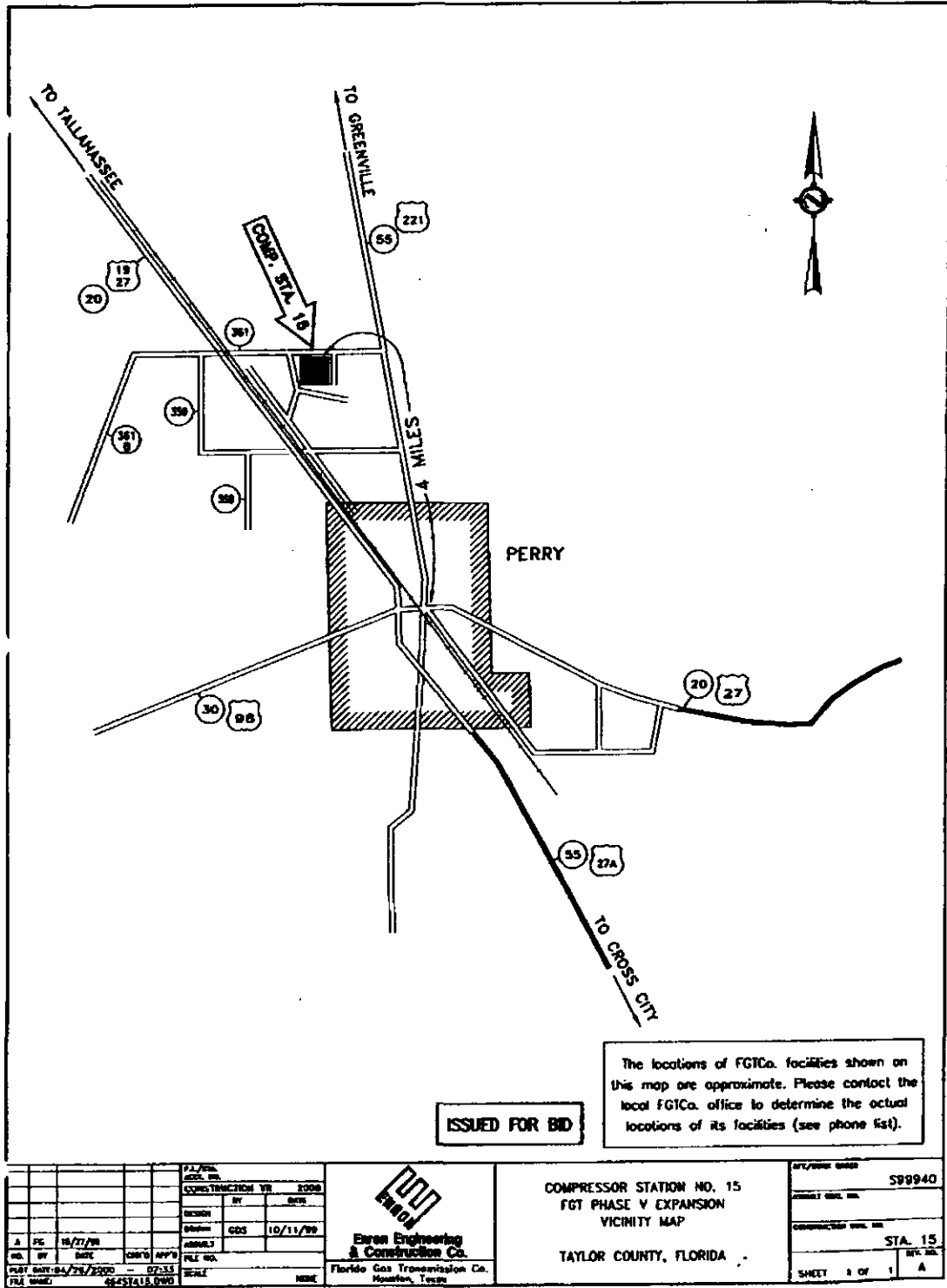


Figure 1-1 Area Map

2.0 PROJECT DESCRIPTION

A plot plan of FGT's Compressor Station No. 15, showing the location of the plant boundaries, the existing emission sources, and the location of the proposed new engine, 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. 15 consists of five 2,000 bhp and one 4,100 bhp natural-gas-fired reciprocating internal combustion (IC) engines. Compressor Station No. 15 also has one 12,600 bhp gas-fired turbine. Table 2-1 summarizes engine manufacturer, model, and the date of installation for each of the existing engines. The original installation was made in 1962 (Compressor Engines 1501 through 1503). Other engines were added in 1966 and 1968 (Compressor Engines 1504 and 1505). These engines were installed before the CAA Amendments of 1977. An addition referred to as Phase II was constructed in 1991 (Compressor Engine 1506) and was subject to PSD review. The turbine (compressor engine 1507) was added in 1994 as part of the Phase III Expansion Project and was also subject to PSD review. These existing engines are not being modified as part of this expansion project except for Engine 1507 which is having its horsepower raised from 12,600 to 13,180 bhp.

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. 15, as part of the Phase V Expansion Project. This will involve adding one new gas-fired turbine (Compressor Engine 1508) and up-grading one existing gas-fired turbine (Compressor Engine 1507). The proposed new horsepower will be used to increase the volumetric delivery capacity by driving gas compressors that are 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 Engine Addition

FGT proposes to install one natural gas-fired turbine engine compressor unit and associated support equipment at Compressor Station No. 15. The turbine engine will be a Cooper-Rolls

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501-KC7 DLE engine compressor unit rated at 7,222 bhp ISO at site elevation. 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.

Table 2-1 Summary of Existing Compressor Engines

Engine #	Date of Installation	Type	Manufacturer	Model #	Brake Horse Power (bhp)
1501	1962	Reciprocating	Worthington	SEHG-8	2000
1502	1962	Reciprocating	Worthington	SEHG-8	2000
1503	1962	Reciprocating	Worthington	SEHG-8	2000
1504	1966	Reciprocating	Worthington	SEHG-8	2000
1505	1968	Reciprocating	Worthington	SEHG-8	2000
1506	1991	Reciprocating	Cooper - Bessemer	8W-330-C2	4100
1507	1994	Turbine	Solar	Mars 90	12,600

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Table 2-2 Proposed Compressor Engine 1508 Specifications and Stack Parameters

Parameter	Design
Compressor Engine	1508
Type	Gas Turbine
Manufacturer	Cooper-Rolls
Model	501-KC7 DLE
Unit Size (shaft)	7,222 bhp (site)
Specific Heat Input ^a	8,736 Btu/hp-hr
Maximum Fuel Consumption ^a	0.0607 MMscf/hr
Speed (shaft)	13,600 rpm
Stack Parameters	
Stack Height	61.17 ft
Stack Diameter	88" x 66"
Exhaust Gas Flow	98,427 acfm
Exhaust Temperature	958 °F
Exhaust Gas Velocity	40.69 ft/sec

NOTE:

acfm = actual cubic feet per minute.
 bhp = brake horsepower.
 Btu/bhp-hr = British thermal units per brake horsepower per hour.
 °F = degrees Fahrenheit.
 ft = feet.
 ft/sec = feet per second.
 MMscf/hr = million standard cubic feet per hour
 rpm = revolutions per minute.

^a Based on vendor provided heat input value of 7942 Btu/hp-hr plus 10% and a heating value for natural gas of 1040 British thermal units per standard cubic foot (Btu/scf).

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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_x, 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 SO₂ 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 2-3 Emissions from FGT's Proposed New Turbine Engine No. 1508

Pollutant	Emission Factor	Reference	lb/hr	TPY
Nitrogen Oxides	5.7 lb/hr	Manufacturer Data	5.7	25.0
Carbon Monoxide	6.96 lb/hr	Manufacturer Data	6.96	30.5
Volatile Organic Compounds (non methane)	1.49 lb/hr	Manufacturer Data	1.49	6.5
Particulate Matter	0.0066 lb/MMBtu	AP-42, Table 3.1-2a	0.42	1.8
Sulfur Dioxide	10 grains/100 scf	FERC Limit	1.73	7.6
HAPs	0.0217 g/bhp-hr See Attachment D	GRI HapCalc 3.0	0.345	1.5

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2.2.2 Upgraded Compressor Turbine

FGT proposes to upgrade one existing natural gas-fired turbine engine compressor unit at Compressor Station No. 15. The engine is a Solar Mars 90 T-13000S turbine compressor unit flat rated at 12,600 bhp that will be upgraded to 13,180 bhp. Fuel will be exclusively natural gas from FGT's natural gas pipeline. Engine specifications and stack parameters for the proposed engine are presented in Table 2-4.

Table 2-4 Proposed Upgraded Turbine (1507) Specifications and Stack Parameters

Parameter	Design
Compressor Engine	1507
Type	Gas Turbine
Manufacturer	Solar
Model	Mars 90 T-13000S
Unit Size	13,180 bhp (ISO with site elev.)
Heat Input ^a	8,419 Btu/hp-hr
Maximum Fuel Consumption ^b	0.1067 MMscf/hr
Speed	8,779 rpm
Stack Parameters	
Stack Height	60 ft
Stack Diameter	7.55 ft x 7.55 ft (rectangular)
Exhaust Gas Flow	177,911 acfm
Exhaust Temperature	868 °F
Exhaust Gas Velocity	52.0 ft/sec
<p>NOTE:</p> <p>acfm = actual cubic feet per minute.</p> <p>bhp = brake horsepower.</p> <p>Btu/hp-hr = British thermal units per brake horsepower per hour.</p> <p>°F = degrees Fahrenheit.</p> <p>ft = feet.</p> <p>ft/sec = feet per second.</p> <p>MMscf/hr = million standard cubic feet per hour.</p> <p>rpm = revolutions per minute.</p> <p>^a Based on vendor heat rate value plus 10%</p> <p>^b Based on vendor value plus 10% and heating value for natural gas of 1040 British thermal units per standard cubic foot (Btu/scf).</p>	

Hourly and annual emissions of regulated pollutants from the proposed engine under normal operating conditions are presented in Table 2-5. Emissions of NO_x, CO and VOCs are based on the engine manufacturer's supplied data (See Attachment C).

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Typically, turbine vendors do not provide information on particulate matter or SO₂ emissions; therefore, particulate matter emissions are based upon USEPA publication AP-42 Table 3.1-2 (USEPA, 2000) and emissions of SO₂ 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 2-5 Proposed Upgraded Turbine (1507) Compressor Engine Emissions

Pollutant	Emission Factor	Reference	lb/hr	TPY
Nitrogen Oxides	10.04 lb/hr	Manufacturer Data	10.04	44.0
Carbon Monoxide	12.23 lb/hr	Manufacturer Data	12.23	53.6
Volatile Organic Compounds	0.35 lb/hr	Manufacturer Data	0.35	1.54
Particulate Matter*	0.0066 lb/MMBtu	AP-42, Table 3.1-2a	0.73	3.2
Sulfur Dioxide*	10 grains/100 scf	FERC Limit	3.05	13.4
HAPs	0.0217 g/bhp-hr See Attachment D	GRI HapCalc 3.0	0.63	2.8

* Emissions based on vendor provided heat rate plus 10 per cent

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 60 feet long by 30 feet high.

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The new generator will be powered by a natural gas fueled, lean burn Waukesha Model L36GL rated at 500 kW (670 bhp). Engine specifications and stack parameters for the proposed engine are presented in Table 2-6 and emissions are presented in Table 2-7.

Table 2-6 Proposed Emergency Generator Engine Specifications and Stack Parameters

Parameter	Design
Compressor Engine	Gen 03
Type	Natural Gas, Lean Burn Reciprocating
Manufacturer	Waukesha
Model	L36GL
Unit Size	670 bhp
Heat Input	5.132 MM Btu/hr
Fuel Consumption ^a	0.00493 MMscf/hr
Speed	1800 rpm
Stack Parameters	
Stack Height	20 ft
Stack Diameter	0.83 ft
Exhaust Gas Flow	6,490 lb/hr
Exhaust Gas Flow	3,543 acfm
Exhaust Temperature	834 °F
Exhaust Gas Velocity	108.34 ft/sec
<p>NOTE:</p> <p>acfm = actual cubic feet per minute. bhp = brake horsepower. Btu/hr = British thermal units per hour. °F = degrees Fahrenheit. ft = feet. ft/sec = feet per second. Lb/hr = pound per hour. MM = million. rpm = revolutions per minute. scf = standard cubic feet.</p> <p>^a Based on heating value for natural gas of 1040 British thermal units per standard cubic foot (Btu/scf).</p>	

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Table 2-7 Emissions from FGT's Proposed Generator Engine

Pollutant	Emission Factor	Reference	lb/hr	TPY
Nitrogen Oxides	2.0 g/hp-hr	Manufacturer Data	2.95	0.74
Carbon Monoxide	1.33 g/hp-hr	Manufacturer Data	1.96	0.49
Volatile Organic Compounds (non methane)	0.28 g/hp-hr	Manufacturer Data	0.41	0.10
Particulate Matter	0.00999 lb/MMBtu	AP-42, Table 3.2-2	0.05	0.01
Sulfur Dioxide	10 grains/100 scf	FERC Limit	0.14	0.04

* based on 500 hours of operation per year

2.2.4 Fugitive Emissions

Potential new emissions from Compressor Station No. 15 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 2-8 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.

2.2.5 Emissions Summary

The total changes in emissions resulting from the project are listed on Table 2-9. 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.

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Table 2-8 VOC Fugitive Emission Calculations and Summary

Component	Service	Component Count	Emissions * Factor (ton/yr)	NM/NE Fraction	Emissions (ton/yr)
Valves	Gas	143	0.0434606	0.05	0.31
Connector	Gas	0	0.0019316	0.05	0.00
Flanges	Gas	128	0.0037666	0.05	0.02
Open-Ended Line	Gas	38	0.0193158	0.05	0.04
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	36	0.0010624	1.00	0.04
Open-Ended Line	Light Oil	2	0.0135211	1.00	0.03
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:	0.9531

* 'EPA publication EPA-453/R-95-017, November 1995, "Protocol for Equipment Leak Emission Estimates"

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Table 2-9 Potential Annual Emissions (tpy) Summary

SOURCE ID	DESCRIPTION	NO _x	CO	VOC ^a	SO ₂	PM
EXISTING FACILITY						
1501	2000 bhp Recip. Engine	227.8	30.9	13.9	1.8	0.3
1502	2000 bhp Recip. Engine	227.8	30.9	13.9	1.8	0.3
1503	2000 bhp Recip. Engine	227.8	30.9	13.9	1.8	0.3
1504	2000 bhp Recip. Engine	227.8	30.9	13.9	1.8	0.3
1505	2000 bhp Recip. Engine	227.8	30.9	13.9	1.8	0.3
1506	4000 bhp Recip. Engine	77.2	96.6	38.6	3.3	0.6
1507	12,600 bhp Turbine	48.6	51.3	2.9	15.8	2.8
GEN01	150 bhp Recip. Engine	0.6	2.3	0.0	0.0	0.0
GEN02	220 bhp Recip. Engine	1.1	0.1	0.0	0.0	0.0
	OTHER SOURCES: ^b			2.8		
EXISTING ANNUAL POTENTIAL TOTALS:		1262.5	304.8	113.8	28.1	4.9

PROPOSED MODIFIED FACILITY						
1501	2000 bhp Recip. Engine	227.8	30.9	13.9	1.8	0.3
1502	2000 bhp Recip. Engine	227.8	30.9	13.9	1.8	0.3
1503	2000 bhp Recip. Engine	227.8	30.9	13.9	1.8	0.3
1504	2000 bhp Recip. Engine	227.8	30.9	13.9	1.8	0.3
1505	2000 bhp Recip. Engine	227.8	30.9	13.9	1.8	0.3
1506	4000 bhp Recip. Engine	77.2	96.6	38.6	3.3	0.6
1507	13,180 bhp Turbine Engine – mod	44.0	53.6	1.5	13.4	2.9
1508	7,222 bhp Turbine Engine –new	25.0	30.5	1.5	7.6	1.8
GEN01	150 bhp Recip. Engine	0.6	2.3	0.0	0.0	0.0
GEN02	220 bhp Recip. Engine	1.1	0.1	0.0	0.0	0.0
GEN03	670 bhp Recip. Engine – new	0.7	0.5	0.1	0.0	0.0
	OTHER SOURCES: ^b			3.8		
PROPOSED ANNUAL POTENTIAL TOTALS:		1287.6	338.1	115	33.3	6.8

NET CHANGES IN POTENTIAL EMISSIONS:	25.1	33.3	1.2	5.2	1.9
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(a) VOC = Non-methane/non-ethane HC

(b) Other Sources Includes ancillary equipment, storage tanks and equipment leaks

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. 15.

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. 15.

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. Taylor County is 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.

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Table 3-1 National and State Ambient Air Quality Standards ($\mu\text{g}/\text{m}^3$)

POLLUTANT	AVERAGING PERIOD	EPA STANDARDS		FLORIDA STANDARDS
		PRIMARY	SECONDARY	
PM ₁₀	24-hour ¹	150	150	150
	annual ²	50	50	50
SO ₂	3-hour ¹	—	1,300	1,300
	24-hour ¹	365	—	260
	Annual ²	80	—	60
CO	1-hour ¹	40,000	—	40,000
	8-hour ¹	10,000	—	10,000
NO ₂	Annual ²	100	100	100
O ₃	1-hour ³	235	235	235
Lead	Quarterly Average	1.5	1.5	1.5

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; FAC 62-272.300

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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.

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 proposed location must be in a PSD area, i.e., an area that has been classified as attainment or as unclassifiable for a particular pollutant. Taylor County is designated as attainment area for all criteria pollutants. A project's potential to emit is then reviewed to determine whether it constitutes a major stationary source or major modification to an existing major stationary source.

A major stationary source is defined as either one 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.

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Since Compressor Station No. 15 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. The increase in emissions resulting from the proposed action will not exceed the PSD significant rate; therefore, the action proposed for Compressor Station No. 15 is a minor modification of an existing major stationary source and is not subject to PSD pre-construction review.

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 ₁₀)	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
VOC = Volatile Organic Compounds Sources: 40 CFR 52.21(b)(23); Table 212.400-2 62-212 F.A.C.	

AQMcs

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. 15 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)

The regulation of new sources through the development of standards applicable to a specific category of sources was a significant step taken by the 1970 CAA Amendments. The Administrator was directed to publish a proposed regulation establishing a Standard of Performance for any category of new sources that cause or contribute significantly to air pollution and which may reasonably be anticipated to endanger public health. All Standards apply to all sources within a given category, regardless of geographic location or ambient air quality at the location.

Performance standards are published in 40 CFR 60. Both the new turbine to be installed at Compressor Station No. 15 and the one to be upgraded are subject to Subpart GG, Standards of Performance for Stationary Gas Turbines, because they both 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_x and SO₂ and requires performance testing and daily monitoring of fuel nitrogen and sulfur. The applicable emission standards are provided in Table 3-4.

The NO_x emission limit for Subpart GG is calculated as follows:

$$STD = 0.0150 (14.4/Y) + F$$

$$STD = \text{Allowable NO}_x \text{ emissions}$$

$$Y = \text{Heat rate at peak load not to exceed 14.4 Kj/watt-hour}$$

AQMcs

$F = NO_x$ 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.

For uprated Engine No. 1507

$$\begin{aligned} Y &= \text{Btu/bhp-hr} \times 1.055 \text{ Kj/Btu} \times \text{hp-hr/745.7 watt-hour} \\ &= 7,654 \text{ Btu/bhp-hr} \times 1.055 \text{ Kj/Btu} \times \text{hp-hr/745.7 watt-hour} \\ &= 10.8 \text{ Kj/watt-hr} \end{aligned}$$

$$\begin{aligned} \text{STD} &= 0.0150 (14.4/10.8) + 0 \\ &= 0.020 \% \\ &= 200 \text{ ppm}_v \end{aligned}$$

For new Engine No. 1508

$$\begin{aligned} Y &= \text{Btu/bhp-hr} \times 1.055 \text{ Kj/Btu} \times \text{hp-hr/745.7 watt-hour} \\ &= 7,942 \text{ Btu/bhp-hr} \times 1.055 \text{ Kj/Btu} \times \text{hp-hr/745.7 watt-hour} \\ &= 11.23 \text{ Kj/watt-hr} \end{aligned}$$

$$\begin{aligned} \text{STD} &= 0.0150 (14.4/11.23) + 0 \\ &= 0.0192 \% \\ &= 192 \text{ ppm}_v \end{aligned}$$

Table 3-6 summarizes the NSPS applicability for the proposed gas engines.

The two turbines at this facility will both meet the NSPS for NO_x of 200 ppmv and 192 ppmv (i.e., manufacturer's estimation of 25 ppmv), and for SO_2 of 150 ppmv (estimated for these turbines to be 4 ppmv).

AQMCs

Table 3-3 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. 1507 Gas Turbine	Gas	NO ₂	>10 MM Btu/hr	101 MM Btu/hr	200 ppm _v	25 ppm _v
GG	60.333(a)	Engine No. 1507 Gas Turbine	Gas	SO ₂	>10 MM Btu/hr	101 MM Btu/hr	150 ppm _v	~4 ppm _v
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. 1508 Gas Turbine	Gas	NO ₂	>10 MM Btu/hr	57 MM Btu/hr	192 ppm _v	25 ppm _v
GG	60.333(a)	Engine No. 1508 Gas Turbine	Gas	SO ₂	>10 MM Btu/hr	57 MM Btu/hr	150 ppm _v	~4 ppm _v

* Design maximum based on vendor data.

AQMs

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 stacks at Compressor Station No. 15 will be 61.17 feet (18.6 meters) and 60 (19.3 m) 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 stacks are less than GEP stack height, they comply with the regulatory requirement.

AQMcS

3.2 Florida State Air Quality Regulations

Compressor Station No. 15 is currently operating under Permit No. 0070012-002-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. 15 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). 2000. Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources (5th Ed.) AP-42. Supplement E, 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: Florida Gas Transmission Company	
2. Site Name: Compressor Station No. 15	
3. Facility Identification Number: 1230034 [] Unknown	
4. Facility Location: Street Address or Other Locator: P.O. Box 8 City: Perry County: Taylor Zip Code: 32347-0930	
5. Relocatable Facility? [] Yes [X] No	6. Existing Permitted Facility? [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 Transmission Company Street Address: 111 Kelsey Lane, Ste. A City: Tampa State: FL Zip Code: 33619	
3. Application Contact Telephone Numbers: Telephone: (800) 381-1477 Fax: (813) 655-3951	

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	7/3/01
2. Permit Number:	1230034-007-AC
3. PSD Number (if applicable):	
4. Siting Number (if applicable):	

Purpose of Application

Air Operation Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

- 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: _____

- 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: 1230034-003-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)

- 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.

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official: Danny Pribble, Vice President Operations
2. Owner/Authorized Representative or Responsible Official Mailing Address: Organization/Firm: Florida Gas Transmission Company Street Address: 1400 Smith Street City: Houston State: TX Zip Code: 77002
3. Owner/Authorized Representative or Responsible Official Telephone Numbers: Telephone: (713)345-7162 Fax: (713) 646-3201
4. Owner/Authorized Representative or Responsible Official Statement: <i>I, the undersigned, am the owner or authorized representative*(check here [], if so) or the responsible official (check here [X], if so) of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.</i> Signature: <u></u> Date: <u>6/29/01</u>

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1. Professional Engineer Name: Kevin McGlynn Registration Number: 50908
2. Professional Engineer Mailing Address: Organization/Firm: McGlynn Consulting Company Street Address: 1967 Commonwealth Lane City: Tallahassee State: FL Zip Code: 32303
3. Professional Engineer Telephone Numbers: Telephone: (850)380-5035 Fax: (850) 350-5002

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 [X], 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.

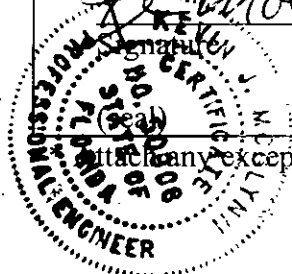
If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [X], if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or 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.

[Handwritten Signature]

June 28, 2001
Date

attach any exception to certification statement.



Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
	Cooper-Rolls 501-KC7 DLE Natural Gas-fired Turbine rated at 7,222 (site) bhp, Engine 1508	AC1D	\$0.00
	Solar Mars 90 T-13000S, Natural Gas-fired Turbine rated at 13,180 bhp, Engine No. 1507		
	New Emergency generator, 670 bhp Waukesha L36GL Reciprocating engine, engine GEN03		
	New fugitive emissions from equipment leaks		

Application Processing Fee

Check one: [] Attached - Amount: \$ _____ [X] Not Applicable

Construction/Modification Information

1. Description of Proposed Project or Alterations:

Installation of a new gas fired Cooper-Rolls 501-KC7 DLE Turbine rated at 7,222 bhp,

Upgrading of an existing Solar Mars 90 T-13000S to 13,180 bhp.

Installation of a new gas-fired 500 kW (670 bhp) Waukesha Model L36GL emergency generator

2. Projected or Actual Date of Commencement of Construction: 01/02/02

3. Projected Date of Completion of Construction: 04/02/02

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.1230034-003-AV.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates:			
Zone: 17	East (km): 249.02	North (km): 3339.60	
2. Facility Latitude/Longitude:			
Latitude (DD/MM/SS): 30/09/54		Longitude (DD/MM/SS): 83/36/33	
3. Governmental Facility Code: 0	4. Facility Status Code: A	5. Facility Major Group SIC Code: 49	6. Facility SIC(s): 4922
7. Facility Comment (limit to 500 characters):			
<p>Compressor Station No. 15 is an existing natural gas pipeline compressor station with seven existing compressor engines. It is classified as a major source under New Source Review and Title V definitions.</p>			

Facility Contact

1. Name and Title of Facility Contact: Larry Parrish, Team Environmental Leader			
2. Facility Contact Mailing Address:			
Organization/Firm: Florida Gas Transmission Company			
Street Address: Rt. 5, Box 48610 CR. 361 or Pisgah Rd.			
City: Perry	State: FL	Zip Code: 32347-0930	
3. Facility Contact Telephone Numbers:			
Telephone: (850) 350-5350		Fax: (850) 350-5351	

Facility Regulatory Classifications

Check all that apply:

1. <input type="checkbox"/> Small Business Stationary Source?	<input type="checkbox"/> Unknown
2. <input checked="" type="checkbox"/> Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	
3. <input type="checkbox"/> Synthetic Minor Source of Pollutants Other than HAPs?	
4. <input checked="" type="checkbox"/> Major Source of Hazardous Air Pollutants (HAPs)?	
5. <input type="checkbox"/> Synthetic Minor Source of HAPs?	
6. <input checked="" type="checkbox"/> One or More Emissions Units Subject to NSPS?	
7. <input type="checkbox"/> One or More Emission Units Subject to NESHAP?	
8. <input type="checkbox"/> Title V Source by EPA Designation?	
<p>I. Facility Regulatory Classifications Comment (limit to 200 characters):</p> <p>Facility is a major source for PSD and Title V purposes. New turbine will be subject to NSPS Subpart GG. The project is not subject to PSD since the increases in emissions are less than the significant levels.</p>	

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 Cap	5. Pollutant Comment
		lb/hour	tons/year		
NO _x	A				
CO	A				
VOC	B				
SO ₂	B				
PM	B				

C. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Area Map Showing Facility Location: [X] Attached, Document ID: <i>Narrative Fig. 1-1</i> [] Not Applicable [] Waiver Requested
2. Facility Plot Plan: [X] Attached, Document ID: <i>_Att. B_</i> [] Not Applicable [] 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: [X] Attached, Document ID: <i>_Attachment C</i> [] Not Applicable
7. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

8. List of Proposed Insignificant Activities: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
9. List of Equipment/Activities Regulated under Title VI: <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Equipment/Activities On site but Not Required to be Individually Listed <input checked="" type="checkbox"/> Not Applicable
10. Alternative Methods of Operation: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
11. Alternative Modes of Operation (Emissions Trading): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
12. Identification of Additional Applicable Requirements: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
13. Risk Management Plan Verification: <input type="checkbox"/> 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: _____) <input type="checkbox"/> Plan to be submitted to CEPPO (Date required: _____) <input checked="" type="checkbox"/> Not Applicable
14. Compliance Report and Plan: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
15. Compliance Certification (Hard-copy Required): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> 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

<p>1. Type of Emissions Unit Addressed in This Section: (Check one)</p> <p><input checked="" type="checkbox"/> 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).</p> <p><input type="checkbox"/> 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.</p> <p><input type="checkbox"/> 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.</p>			
<p>2. Regulated or Unregulated Emissions Unit? (Check one)</p> <p><input checked="" type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.</p> <p><input type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.</p>			
<p>3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):</p> <p>7,222 bhp natural gas fired turbine compressor unit</p>			
<p>4. Emissions Unit Identification Number:</p> <p>ID:</p>		<p><input checked="" type="checkbox"/> No ID</p> <p><input type="checkbox"/> ID Unknown</p>	
<p>5. Emissions Unit Status Code:</p> <p>C</p>	<p>6. Initial Startup Date: 03/02/02</p>	<p>7. Emissions Unit Major Group SIC Code:</p> <p>49</p>	<p>8. Acid Rain Unit?</p> <p><input type="checkbox"/></p>
<p>9. Emissions Unit Comment: (Limit to 500 Characters)</p> <p>The proposed turbine engine will be a Cooper-Rolls 501-KC7 DLE engine compressor unit ISO rated at 7,200 bhp and site rated at 7,222 bhp. Fuel will be exclusively natural gas from the FGT's gas pipeline. The proposed engine will incorporate dry, low NO_x combustion technology.</p>			

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: Cooper-Rolls	Model Number: 501-KC7 DLE
2. Generator Nameplate Rating: MW	
3. Incinerator Information:	
Dwell Temperature:	°F
Dwell Time:	seconds
Incinerator Afterburner Temperature:	°F

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

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:	63.09	mmBtu/hr
2. Maximum Incineration Rate:	lb/hr	tons/day
3. Maximum Process or Throughput 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 Comment (limit to 200 characters):		
Heat input is 63.09 MM Btu/hr based on vendor specifications of 7,942 Btu/Bhp-hr plus 10% and 7,222 bhp.		

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

List of Applicable Regulations

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

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

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? 1508		2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): NA			
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: NA			
5. Discharge Type Code: V	6. Stack Height: 61.17 feet	7. Exit Diameter: 88" x 66"	
8. Exit Temperature: 958 °F	9. Actual Volumetric Flow Rate: 98,427 acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates: Zone: 17 East (km): 249.02 North (km): 3339.60			
14. Emission Point Comment (limit to 200 characters): 40 CFR 60 Appendix A Method 1: Equivalent diameter (D_e) = $2WL / W + L$ = $(2 \times 7.333' \times 5.5') / (7.333' + 5.5')$ = $80.663 / 12.833 = 6.28'$			

**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 turbine engine driving a natural gas compressor, operating full time.		
2. Source Classification Code (SCC): 2-02-002-01		3. SCC Units: Million cubic feet burned
4. Maximum Hourly Rate: 0.0607	5. Maximum Annual Rate: 531.42	6. Estimated Annual Activity Factor: NA
7. Maximum % Sulfur: 0.03	8. Maximum % Ash: NA	9. Million Btu per SCC Unit: 1040
10. Segment Comment (limit to 200 characters): Based on fuel rate of 63.09 MMBtu/hr. Percent sulfur is base on maximum Federal Energy Regulatory Commission (FERC) limit of 10 gr S/100 scf and gas density of 0.0455 lb/scf.		

Segment Description and Rate: Segment NA of _____

1. Segment Description (Process/Fuel Type) (limit to 500 characters): 		
2. Source Classification Code (SCC):		3. SCC Units:
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters): 		

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

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
NOX	099		EL
CO			NS
VOC			NS
SO2			EL
PM			NS
PM10			NS
HAPS			NS

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 Efficiency of Control:
3. Potential Emissions: 5.7 lb/hour 25.0 tons/year	4. Synthetically Limited? []
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year	
6. Emission Factor: 5.7 lb/hr Reference: Vendor's data	7. Emissions Method Code: 5
8. Calculation of Emissions (limit to 600 characters): (5.7 lb/hr)(1 ton/2000 lb)(8760 hr/1 yr) = 24.97 tons/year	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Based on vendor's data. See Attachment C.	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: NA
3. Requested Allowable Emissions and Units: 25 ppmv	4. Equivalent Allowable Emissions: 5.7 lb/hour 25.0 tons/year
5. Method of Compliance (limit to 60 characters): Initial performance test.	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): 40 CFR 60.332(3) limits NOX emissions to 196 ppmv.	

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

Potential/Fugitive Emissions

1. Pollutant Emitted: CO		2. Total Percent Efficiency of Control:	
3. Potential Emissions: 6.96 lb/hour 30.5 tons/year		4. Synthetically Limited? []	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year			
6. Emission Factor: 6.96 lb/hr Reference: Vendor's data		7. Emissions Method Code: 5	
8. Calculation of Emissions (limit to 600 characters): (6.96 lb/hr)(1 ton/2000 lb)(8760 hr/1 yr) = 30.48 tons/year			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Based on vendor's data. See Attachment C.			

Allowable Emissions Allowable Emissions NA of _____

1. Basis for Allowable Emissions Code: NA		2. Future Effective Date of Allowable Emissions: NA	
3. Requested Allowable Emissions and Units:		4. Equivalent Allowable Emissions: lb/hour tons/year	
5. Method of Compliance (limit to 60 characters):			
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):			

**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: 1.49 lb/hour 6.5 tons/year		4. Synthetically Limited? []	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year			
6. Emission Factor: 1.49 lb/hr Reference: Vendor's data		7. Emissions Method Code: 5	
8. Calculation of Emissions (limit to 600 characters): (1.49 lb/hr)(1 ton/2000 lb)(8760 hr/1 yr) = 6.53 tons/year			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Based on vendor's data. See Attachment C.			

Allowable Emissions Allowable Emissions NA of _____

1. Basis for Allowable Emissions Code: NA		2. Future Effective Date of Allowable Emissions: NA	
3. Requested Allowable Emissions and Units:		4. Equivalent Allowable Emissions: lb/hour tons/year	
5. Method of Compliance (limit to 60 characters):			
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):			

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

Potential/Fugitive Emissions

1. Pollutant Emitted: SO ₂	2. Total Percent Efficiency of Control:
3. Potential Emissions: 1.73 lb/hour 7.6 tons/year	4. Synthetically Limited? []
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year	
6. Emission Factor: 10 gr/100scf Reference: Vendor's fuel use	7. Emissions Method Code: 2
8. Calculation of Emissions (limit to 600 characters): $(10 \text{ gr S}/100 \text{ scf})(0.0607 \text{ MMscf}/\text{hr})(1 \text{ lb}/7000 \text{ gr}) = 0.87 \text{ lb S}/\text{hr}$ $(0.87 \text{ lb S}/\text{hr})(2 \text{ lb SO}_2/\text{lb S}) = 1.73 \text{ lb SO}_2/\text{hr}$ $(1.73 \text{ lb SO}_2/\text{hr})(8760 \text{ hr}/\text{yr})(1 \text{ ton}/2000 \text{ lb}) = 7.60 \text{ ton}/\text{yr}$	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): SO ₂ emission factor is based on maximum Federal Energy Regulatory Commission (FERC) limit of 10 gr S/100 scf and gas density of 0.0455 lb/scf.	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: NA
3. Requested Allowable Emissions and Units: 4 ppmv	4. Equivalent Allowable Emissions: 1.73 lb/hour 7.6 tons/year
5. Method of Compliance (limit to 60 characters): Initial performance test and fuel monitoring.	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): 40 CFR 60.333(a) limits SO ₂ emissions to 150 ppmv.	

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

Potential/Fugitive Emissions

1. Pollutant Emitted: PM		2. Total Percent Efficiency of Control:	
3. Potential Emissions: 0.42 lb/hour 1.8 tons/year		4. Synthetically Limited? []	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year			
6. Emission Factor: 0.0066 lb/MM Btu Reference: Table 3.1-2a, AP-42 4/00, Supplement E		7. Emissions Method Code: 4	
8. Calculation of Emissions (limit to 600 characters): (0.0066 lb/MM Btu)(62.1 MM Btu/hr) = 0.42 lb/hr (0.42 lb/hr)(8760 hr/yr)(1 ton/2000 lb) = 1.84 ton/yr			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Based on vendor's fuel use data plus 10%.			

Allowable Emissions Allowable Emissions NA of _____

1. Basis for Allowable Emissions Code: NA		2. Future Effective Date of Allowable Emissions: NA	
3. Requested Allowable Emissions and Units:		4. Equivalent Allowable Emissions: lb/hour tons/year	
5. Method of Compliance (limit to 60 characters):			
6. Allowable Emissions Comment (Desc. Of Operating Method) (limit to 200 characters):			

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

Potential/Fugitive Emissions

1. Pollutant Emitted: HAPS		2. Total Percent Efficiency of Control:	
3. Potential Emissions: 0.345 lb/hour 1.5 tons/year		4. Synthetically Limited? []	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year			
6. Emission Factor: 0.0217 g/hp-hr Reference: GRI-HAPCalc 3.0		7. Emissions Method Code: 5	
8. Calculation of Emissions (limit to 600 characters): $(0.0217\text{g/hp-hr})(7,222\text{ hp})(1\text{ lb}/453.6\text{ g}) = 0.345\text{ lb/hr}$ $(0.345\text{lb/hr})(8760\text{ hr/yr})(1\text{ ton}/2000\text{ lb}) = 1.51\text{ ton/yr}$			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Emission calculations based on Gas Research Institute's software GRI-HAPCALC. Emissions based on factors prioritized by field test data, USEPA factors and literature.			

Allowable Emissions Allowable Emissions NA of _____

1. Basis for Allowable Emissions Code: NA		2. Future Effective Date of Allowable Emissions: NA	
3. Requested Allowable Emissions and Units:		4. Equivalent Allowable Emissions: lb/hour tons/year	
5. Method of Compliance (limit to 60 characters):			
6. Allowable Emissions Comment (Desc. Of Operating Method) (limit to 200 characters):			

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

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype: VE20	2. Basis for Allowable Opacity: [X] Rule [] Other
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):	

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

Supplemental Requirements

1. Process Flow Diagram <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested
2. Fuel Analysis or Specification <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested
3. Detailed Description of Control Equipment <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
4. Description of Stack Sampling Facilities <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested
5. Compliance Test Report <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously submitted, Date: _____ <input checked="" type="checkbox"/> Not Applicable
6. Procedures for Startup and Shutdown <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested
7. Operation and Maintenance Plan <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
8. Supplemental Information for Construction Permit Application <input checked="" type="checkbox"/> Attached, Document ID: <u>Attach. C</u> <input type="checkbox"/> Not Applicable
9. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
10. Supplemental Requirements Comment: Process flow diagrams and fuel analyses have been previously submitted. Supplemental information is provided in the narrative description accompanying these forms.

Additional Supplemental Requirements for Title V Air Operation Permit Applications

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

<p>1. Type of Emissions Unit Addressed in This Section: (Check one)</p> <p><input checked="" type="checkbox"/> 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).</p> <p><input type="checkbox"/> 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.</p> <p><input type="checkbox"/> 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.</p>			
<p>2. Regulated or Unregulated Emissions Unit? (Check one)</p> <p><input checked="" type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.</p> <p><input type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.</p>			
<p>3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):</p> <p>13,180 bhp natural gas fired turbine compressor unit, Engine No. 1507</p>			
<p>4. Emissions Unit Identification Number:</p> <p><input checked="" type="checkbox"/> No ID</p> <p>ID:</p>			
<p>5. Emissions Unit Status Code:</p> <p>A</p>	<p>6. Initial Startup Date: 4/2/02</p>	<p>7. Emissions Unit Major Group SIC Code:</p> <p>49</p>	<p>8. Acid Rain Unit?</p> <p><input type="checkbox"/></p>
<p>9. Emissions Unit Comment: (Limit to 500 Characters)</p> <p>The existing Solar Mars 90 T-13000S turbine engine will be uprated from 12,600 bhp to 13,180 bhp. Fuel will be exclusively natural gas from the FGT's gas pipeline. The proposed engine will incorporate dry, low NO_x combustion technology.</p>			

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method):

The proposed engine will incorporate dry, low NO_x combustion technology.

2. Control Device or Method Code(s): NA

Emissions Unit Details

1. Package Unit:		
Manufacturer:	Solar	Model
Number: Mars 90-T13000S		
2. Generator Nameplate Rating:		MW
3. Incinerator Information:		
	Dwell Temperature:	°F
	Dwell Time:	seconds
	Incinerator Afterburner Temperature:	°F

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

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:	110.97 mmBtu/hr	
2. Maximum Incineration Rate:	NA	lb/hr
3. Maximum Process or Throughput Rate:	NA	
4. Maximum Production Rate:	NA	
5. Requested Maximum Operating Schedule:	24 hours/day	7 days/week
	52 weeks/year	8760 hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):	<p>Heat input is 110.97 MM Btu/hr based on vendor specifications of 7,654 Btu/Bhp-hr plus 10% and 13,180 bhp.</p>	

**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	

**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 turbine engine driving a natural gas compressor, operating full time.		
2. Source Classification Code (SCC): 2-02-002-01		3. SCC Units: million cubic feet burned
4. Maximum Hourly Rate: 0.1067	5. Maximum Annual Rate: 934.69	6. Estimated Annual Activity Factor: NA
7. Maximum % Sulfur: 0.03	8. Maximum % Ash: 0.0	9. Million Btu per SCC Unit: 1040
10. Segment Comment (limit to 200 characters): Fuel use based on vendor data plus 10%. 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 and Rate: Segment NA of

1. Segment Description (Process/Fuel Type) (limit to 500 characters): 		
2. Source Classification Code (SCC):		SCC Units:
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters): 		

**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			EL
SO ₂			EL
PM			EL
NO _x			EL
CO			EL
PM ₁₀			EL
HAPs			NS

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 Efficiency of Control:
3. Potential Emissions: 10.04 lb/hour 44.0 tons/year	4. Synthetically Limited? []
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year	
6. Emission Factor: 10.04 lb/hr Reference: Vendor's data	7. Emissions Method Code: 5
8. Calculation of Emissions (limit to 600 characters): (10.04 lb/hr)(1 ton/2000 lb)(8760hr/1 yr) = 43.98 tons/year	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Vendor's data based on ISO conditions with site elevation.	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: NA
3. Requested Allowable Emissions and Units: 25 ppmv	4. Equivalent Allowable Emissions: 10.04 lb/hour 44.0 tons/year
5. Method of Compliance (limit to 60 characters): Initial performance test.	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): 40 CFR 60.332(a)(2) limits NOX emissions to 200 ppmv.	

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

Potential/Fugitive Emissions

1. Pollutant Emitted: CO		2. Total Percent Efficiency of Control:	
3. Potential Emissions: 12.23 lb/hour 53.6 tons/year		4. Synthetically Limited? []	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year			
6. Emission Factor: 12.23 lb/hr Reference: Vendor's data		7. Emissions Method Code: 5	
8. Calculation of Emissions (limit to 600 characters): (12.23 lb/hr)(1 ton/2000 lb)(8760 hr/1 yr) = 53.57 tons/year			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Vendor emission factor is based on a guaranteed value of 50 ppmv.			

Allowable Emissions Allowable Emissions NA of _____

1. Basis for Allowable Emissions Code:		2. Future Effective Date of Allowable Emissions: NA	
3. Requested Allowable Emissions and Units:		4. Equivalent Allowable Emissions: lb/hour tons/year	
5. Method of Compliance (limit to 60 characters):			
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):			

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: 0.350 lb/hour 1.5 tons/year	4. Synthetically Limited? []
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year	
6. Emission Factor: 3.50 lb/hr UHC Reference: Vendor's data	7. Emissions Method Code: 5
8. Calculation of Emissions (limit to 600 characters): Vendor factor for unburned hydrocarbons (UHC) = 3.50 lb/hr. Assume 10% is VOC. $(0.350 \text{ lb/hr})(1 \text{ ton}/2000 \text{ lb})(8760 \text{ hr}/1 \text{ yr}) = 1.53 \text{ tons/year}$	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

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

Potential/Fugitive Emissions

1. Pollutant Emitted: SO ₂		2. Total Percent Efficiency of Control:	
3. Potential Emissions: 3.05 lb/hour 13.4 tons/year		4. Synthetically Limited? []	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year			
6. Emission Factor: 10 gr/100scf Reference: Vendor's fuel use and FERC limitation		7. Emissions Method Code: 3	
8. Calculation of Emissions (limit to 600 characters): $(10 \text{ gr S}/100 \text{ scf})(0.1067 \text{ MMscf/hr})(1 \text{ lb}/7000 \text{ gr}) = 1.52 \text{ lb S/hr}$ $(1.52 \text{ lb S/hr})(2 \text{ lb SO}_2/\text{lb S}) = 3.05 \text{ lb SO}_2/\text{hr}$ $(3.05 \text{ lb SO}_2/\text{hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) = 13.35 \text{ ton/yr}$			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Based on vendor's fuel use data plus 10%. SO ₂ emission factor is based on maximum Federal Energy Regulatory Commission (FERC) limit of 10 gr S/100 scf and gas density of 0.0455 lb/scf.			

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: RULE		2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: 4 ppmv		4. Equivalent Allowable Emissions: 3.05 lb/hour 13.5 tons/year	
5. Method of Compliance (limit to 60 characters): Initial performance test and fuel monitoring.			
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): 40 CFR 60.332(3) limits SO ₂ emissions to 150 ppmv.			

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

Potential/Fugitive Emissions

1. Pollutant Emitted: PM		2. Total Percent Efficiency of Control:	
3. Potential Emissions: 0.73 lb/hour 3.2 tons/year		4. Synthetically Limited? []	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year			
6. Emission Factor: 0.0066 lb/MM Btu Reference: Table 3.1-2a, AP-42 4/00 Supplement E		7. Emissions Method Code: 4	
8. Calculation of Emissions (limit to 600 characters): (0.0066 lb/MM Btu)(110.97 MM Btu/hr) = 0.73 lb/hr (0.73 lb/hr)(8760 hr/yr)(1 ton/2000 lb) = 3.21 ton/y			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Based on vendor's fuel use data plus 10%.			

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 characters):			
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):			

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

Potential/Fugitive Emissions

1. Pollutant Emitted: HAPS		2. Total Percent Efficiency of Control:	
3. Potential Emissions: 0.63 lb/hour 2.8 tons/year		4. Synthetically Limited? []	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year			
6. Emission Factor: 0.0217 g/hp-hr Reference: GRI-HAPCalc 3.0		7. Emissions Method Code: 5	
8. Calculation of Emissions (limit to 600 characters): $(0.0217\text{g/hp-hr})(13,180\text{ hp})(1\text{ lb}/453.6\text{ g}) = 0.63\text{ lb/hr}$ $(0.63\text{ lb/hr})(8760\text{ hr/yr})(1\text{ ton}/2000\text{ lb}) = 2.76\text{ ton/yr}$			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Emission calculations based on Gas Research Institute's software GRI-HAPCALC. Emissions based on factors prioritized by field test data, USEPA factors and literature.			

Allowable Emissions Allowable Emissions NA of _____

1. Basis for Allowable Emissions Code: NA		2. Future Effective Date of Allowable Emissions: NA	
3. Requested Allowable Emissions and Units:		4. Equivalent Allowable Emissions: lb/hour tons/year	
5. Method of Compliance (limit to 60 characters):			
6. Allowable Emissions Comment (Desc. Of Operating Method) (limit to 200 characters):			

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

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype: VE20	2. Basis for Allowable Opacity: <input checked="" type="checkbox"/> Rule [] Other
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):	

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: Other	[] Rule []
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters):	

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

Supplemental Requirements

1. Process Flow Diagram <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested
2. Fuel Analysis or Specification <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested
3. Detailed Description of Control Equipment <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
4. Description of Stack Sampling Facilities <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested
5. Compliance Test Report <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously submitted, Date: _____ <input checked="" type="checkbox"/> Not Applicable
6. Procedures for Startup and Shutdown <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested
7. Operation and Maintenance Plan <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
8. Supplemental Information for Construction Permit Application <input checked="" type="checkbox"/> Attached, Document ID: <u> Attach. C </u> <input type="checkbox"/> Not Applicable
9. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
10. Supplemental Requirements Comment: <p>Supplemental information is provided in the narrative description and Attachment C accompanying these forms. Emissions testing has not been performed on this unit.</p>

Additional Supplemental Requirements for Title V Air Operation Permit Applications

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

<p>1. Type of Emissions Unit Addressed in This Section: (Check one)</p> <p><input checked="" type="checkbox"/> 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).</p> <p><input type="checkbox"/> 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.</p> <p><input type="checkbox"/> 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.</p>			
<p>2. Regulated or Unregulated Emissions Unit? (Check one)</p> <p><input type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.</p> <p><input checked="" type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.</p>			
<p>3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):</p> <p>Emergency generator Waukesha Model L36GL rated at 670 bhp</p>			
<p>4. Emissions Unit Identification Number:</p> <p><input type="checkbox"/> ID: <input checked="" type="checkbox"/> ID Unknown</p>			
<p>5. Emissions Unit Status Code:</p> <p style="text-align: center;">C</p>	<p>6. Initial Startup Date: 04/02/02</p>	<p>7. Emissions Unit Major Group SIC Code:</p> <p style="text-align: center;">49</p>	<p>8. Acid Rain Unit?</p> <p style="text-align: center;"><input type="checkbox"/></p>
<p>9. Emissions Unit Comment: (Limit to 500 Characters)</p> <p>The proposed generator engine will be a Waukesha Model L36GL reciprocating engine rated at 500 kW (670 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.</p>			

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method):

NA

2. Control Device or Method Code(s): NA

Emissions Unit Details

1. Package Unit:	
Manufacturer: Waukesha	Model Number: L36GL
2. Generator Nameplate Rating: 0.500 MW	
3. Incinerator Information:	
Dwell Temperature:	°F
Dwell Time:	seconds
Incinerator Afterburner Temperature:	°F

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

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:	5.13	mmBtu/hr
2. Maximum Incineration Rate:	lb/hr	tons/day
3. Maximum Process or Throughput Rate:		
4. Maximum Production Rate:		
5. Requested Maximum Operating Schedule:		
	hours/day	days/week
	weeks/year	500 hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):		
Heat input is 5.13 MM Btu/hr based on vendor specifications.		
Schedule will be limited to 500 hours per year.		

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

List of Applicable Regulations

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

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

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? GEN 03		2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): NA			
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: NA			
5. Discharge Type Code: V	6. Stack Height: 20 feet	7. Exit Diameter: 0.83 feet	
8. Exit Temperature: 834 °F	9. Actual Volumetric Flow Rate: 3543 acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates: Zone: 17 East (km): 249.02 North (km): 3339.60			
14. Emission Point Comment (limit to 200 characters): The unit will not be operated more than 500 hours per year.			

**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 engine driving a 500 Kw generator, operating no more than 500 hours per year.		
2. Source Classification Code (SCC): 2-02-002-54		3. SCC Units: Million cubic feet burned
4. Maximum Hourly Rate: 0.00493	5. Maximum Annual Rate: 2.47	6. Estimated Annual Activity Factor: NA
7. Maximum % Sulfur: 0.03	8. Maximum % Ash: NA	9. Million Btu per SCC Unit: 1040
10. Segment Comment (limit to 200 characters): Based on vendor supplied heat rate of 5.13 MM Btu/hr and a fuel heat value of 1040 Btu/scf. Percent sulfur is base on maximum Federal Energy Regulatory Commission (FERC) limit of 10 gr S/100 scf and gas density of 0.0455 lb/scf.		

Segment Description and Rate: Segment NA of NA

1. Segment Description (Process/Fuel Type) (limit to 500 characters): NA		
2. Source Classification Code (SCC):		3. SCC Units:
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
NOX			NS
CO			NS
VOC			NS
SO2			NS
PM10			NS
PM25			NS

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 Efficiency of Control:	
3. Potential Emissions: 2.95 lb/hour 12.9 tons/year		4. Synthetically Limited? [X]	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year			
6. Emission Factor: 2.0 g/hp-hr Reference: Vendor's data		7. Emissions Method Code: 5	
8. Calculation of Emissions (limit to 600 characters): $(2.0 \text{ g/hp-hr})(670 \text{ hp})/453.6 \text{ g/lb} = 2.95 \text{ lb/hr}$ $(2.95 \text{ lb/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) = 12.94 \text{ tpy}$ $(2.95 \text{ lb/hr})(500 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) = 0.74 \text{ tpy}$			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Operation limited to 500 hours per year.			

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: OTHER		2. Future Effective Date of Allowable Emissions: NA	
3. Requested Allowable Emissions and Units: NA		4. Equivalent Allowable Emissions: NA lb/hour 0.74 tons/year	
5. Method of Compliance (limit to 60 characters): Maintain record of hours of operation.			
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Limitation on hours to 500 hrs/yr meets US EPA's definition of an emergency generator as insignificant source for Title V purposes.			

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

Potential/Fugitive Emissions

1. Pollutant Emitted: CO		2. Total Percent Efficiency of Control:	
3. Potential Emissions: 1.96 lb/hour 8.60 tons/year		4. Synthetically Limited? [X]	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year			
6. Emission Factor: 1.33 g/hp-hr Reference: Vendor's data		7. Emissions Method Code: 5	
8. Calculation of Emissions (limit to 600 characters): $(1.33 \text{ g/hp-hr})(670 \text{ hp})/453.6 \text{ g/lb} = 1.96 \text{ lb/hr}$ $(1.96 \text{ lb/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) = 8.60 \text{ tpy}$ $(1.96 \text{ lb/hr})(500 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) = 0.49 \text{ tpy}$			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Operation limited to 500 hours per year.			

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: OTHER		2. Future Effective Date of Allowable Emissions: NA	
3. Requested Allowable Emissions and Units: NA		4. Equivalent Allowable Emissions: NA lb/hour 0.49 tons/year	
5. Method of Compliance (limit to 60 characters): Maintain record of hours of operation.			
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Limitation on hours to 500 hrs/yr meets US EPA's definition of an emergency generator as insignificant source for Title V purposes.			

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: 0.41 lb/hour 1.81 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year	
6. Emission Factor: 0.28 g/hp-hr Reference: Vendor's data	7. Emissions Method Code: 5
8. Calculation of Emissions (limit to 600 characters): Vendor factor for non-methane hydrocarbons (NMHC) = 0.24 g/hp-hr. Assume all is VOC. (0.28 g/hp-hr)(670 hp)/453.6 g/lb = 0.41 lb/hr (0.41 lb/hr)(8760 hr/yr)(1 ton/2000 lb) = 1.81 tpy (0.41 lb/hr)(500 hr/yr)(1 ton/2000 lb) = 0.10 tpy	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Operation limited to 500 hours per year.	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: OTHER	2. Future Effective Date of Allowable Emissions: NA
3. Requested Allowable Emissions and Units: NA	4. Equivalent Allowable Emissions: NA lb/hour 0.10 tons/year
5. Method of Compliance (limit to 60 characters): Maintain record of hours of operation.	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Limitation on hours to 500 hrs/yr meets US EPA's definition of an emergency generator as insignificant source for Title V purposes.	

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

Potential/Fugitive Emissions

1. Pollutant Emitted: SO ₂	2. Total Percent Efficiency of Control:
3. Potential Emissions: 0.14 lb/hour 0.61 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year	
6. Emission Factor: 10 grains / 100 scf natural gas fuel Reference: Vendor's data	7. Emissions Method Code: 2
8. Calculation of Emissions (limit to 600 characters): $(10 \text{ gr S}/100 \text{ scf})(0.0049 \text{ MMscf/hr})(1 \text{ lb}/7000 \text{ gr}) = 0.070 \text{ lb S/hr}$ $(0.070 \text{ lb S/hr})(2 \text{ lb SO}_2/\text{lb S}) = 0.14 \text{ lb SO}_2/\text{hr}$ $(0.14 \text{ lb SO}_2/\text{hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) = 0.61 \text{ ton/yr}$ $(0.14 \text{ lb SO}_2/\text{hr})(500 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) = 0.04 \text{ ton/yr}$	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Operation limited to 500 hours per year. SO ₂ emission factor is based on maximum Federal Energy Regulatory Commission (FERC) limit of 10 gr S/100 scf and gas density of 0.0455 lb/scf.	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: OTHER	2. Future Effective Date of Allowable Emissions: NA
3. Requested Allowable Emissions and Units: NA	4. Equivalent Allowable Emissions: NA lb/hour 0.04 tons/year
5. Method of Compliance (limit to 60 characters): Maintain record of hours of operation.	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Limitation on hours to 500 hrs/yr meets US EPA's definition of an emergency generator as insignificant source for Title V purposes.	

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

Potential/Fugitive Emissions

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control:
3. Potential Emissions: 0.05 lb/hour 0.22 tons/year	4. Synthetically Limited? <input checked="" type="checkbox"/>
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year	
6. Emission Factor: 0.00999 lb/MM Btu Reference: AP-42 Section 3.2 Table 3.2-2, 4/00 Supplement E	7. Emissions Method Code: 4
8. Calculation of Emissions (limit to 600 characters): $(0.00999 \text{ lb/MM Btu})(5.13 \text{ MM Btu/hr}) = 0.0513 \text{ lb/hr}$ $(0.0513 \text{ lb/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) = 0.22 \text{ ton/y}$ $(0.05 \text{ lb/hr})(500 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) = 0.01 \text{ ton/y}$	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Operation limited to 500 hours per year. Based on vendor's fuel use data.	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: OTHER	2. Future Effective Date of Allowable Emissions: NA
3. Requested Allowable Emissions and Units: NA	4. Equivalent Allowable Emissions: NA lb/hour 0.01 tons/year
5. Method of Compliance (limit to 60 characters): Maintain record of hours of operation.	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Limitation on hours to 500 hrs/yr meets US EPA's definition of an emergency generator as insignificant source for Title V purposes.	

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

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: VE20	2. Basis for Allowable Opacity: <input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
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: <input type="checkbox"/> Rule <input type="checkbox"/> 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):	

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

Supplemental Requirements

1. Process Flow Diagram <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested
2. Fuel Analysis or Specification <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested
3. Detailed Description of Control Equipment <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
4. Description of Stack Sampling Facilities <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested
5. Compliance Test Report <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously submitted, Date: _____ <input checked="" type="checkbox"/> Not Applicable
6. Procedures for Startup and Shutdown <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
7. Operation and Maintenance Plan <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
8. Supplemental Information for Construction Permit Application <input checked="" type="checkbox"/> Attached, Document ID: <u>Attach. C</u> <input type="checkbox"/> Not Applicable
9. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
10. Supplemental Requirements Comment: Supplemental information is provided in the narrative description accompanying these forms.

Additional Supplemental Requirements for Title V Air Operation Permit Applications

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

<p>1. Type of Emissions Unit Addressed in This Section: (Check one)</p> <p><input type="checkbox"/> 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).</p> <p><input type="checkbox"/> 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.</p> <p><input checked="" type="checkbox"/> 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.</p>			
<p>2. Regulated or Unregulated Emissions Unit? (Check one)</p> <p><input type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.</p> <p><input checked="" type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.</p>			
<p>3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):</p> <p>Fugitive emissions from component leaks.</p>			
<p>4. Emissions Unit Identification Number:</p> <p><input type="checkbox"/> ID: <input checked="" type="checkbox"/> ID Unknown</p>			
<p>5. Emissions Unit Status Code:</p> <p style="text-align: center;">C</p>	<p>6. Initial Startup Date: 04/02/02</p>	<p>7. Emissions Unit Major Group SIC Code:</p> <p style="text-align: center;">49</p>	<p>8. Acid Rain Unit? <input type="checkbox"/></p>
<p>9. Emissions Unit Comment: (Limit to 500 Characters)</p> <p>These are new fugitive leak emissions from new components (valves, flanges, etc.)</p>			

Emissions Unit Control Equipment

<p>1. Control Equipment/Method Description (Limit to 200 characters per device or method):</p> <p style="margin-left: 40px;">NA</p>
<p>2. Control Device or Method Code(s): NA</p>

Emissions Unit Details

<p>1. Package Unit:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">Manufacturer:</td> <td style="width: 50%; border: none;">Model Number:</td> </tr> </table>	Manufacturer:	Model Number:				
Manufacturer:	Model Number:					
<p>2. Generator Nameplate Rating: MW</p>						
<p>3. Incinerator Information:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 60%; border: none;">Dwell Temperature:</td> <td style="width: 40%; border: none;">°F</td> </tr> <tr> <td style="border: none;">Dwell Time:</td> <td style="border: none;">seconds</td> </tr> <tr> <td style="border: none;">Incinerator Afterburner Temperature:</td> <td style="border: none;">°F</td> </tr> </table>	Dwell Temperature:	°F	Dwell Time:	seconds	Incinerator Afterburner Temperature:	°F
Dwell Temperature:	°F					
Dwell Time:	seconds					
Incinerator Afterburner Temperature:	°F					

**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 Throughput 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 Comment (limit to 200 characters):		

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

List of Applicable Regulations

None	

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

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? FUGITIVE		2. Emission Point Type Code: 4	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): NA			
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: NA			
5. Discharge Type Code: F	6. Stack Height: NA feet	7. Exit Diameter: NA feet	
8. Exit Temperature: 77 °F	9. Actual Volumetric Flow Rate: NA acfm	10. Water Vapor: NA %	
11. Maximum Dry Standard Flow Rate: NA dscfm		12. Nonstack Emission Point Height: 0 feet	
13. Emission Point UTM Coordinates: Zone: 17 East (km): 249.02 North (km): 3339.60			
14. Emission Point Comment (limit to 200 characters):			

**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): Fugitive emissions from component leaks.		
2. Source Classification Code (SCC): 3-10-888-11		3. SCC Units: MM cubic feet produced
4. Maximum Hourly Rate: 0	5. Maximum Annual Rate: 0	6. Estimated Annual Activity Factor: component count
7. Maximum % Sulfur: NA	8. Maximum % Ash: NA	9. Million Btu per SCC Unit: NA
10. Segment Comment (limit to 200 characters): Based on count of new components and USEPA emission factors provided in EPA publication EPA-453/R-95-017, November 1995, "Protocol for Equipment Leak Emission Estimates"		

Segment Description and Rate: Segment NA of NA

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):		3. SCC Units:
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

**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

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: 0.22 lb/hour 0.95 tons/year	4. Synthetically Limited? [Y]
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year	
6. Emission Factor: lb/hr/component Reference: EPA-453/R-95-017, Protocol for Equipment Leak EmissionEstimates"	7. Emissions Method Code: 5
8. Calculation of Emissions (limit to 600 characters): (EPA factor for specific component type) (number of components of specific type) = tpy. Assume non-methane/non-ethane fraction is 5% of gas service. (tons/year)(2000 lb/ton)(1 yr/8760 hr) = lb/hr See Attachment D for details.	
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 Allowable Emissions NA of _____

1. Basis for Allowable Emissions Code: NA	2. Future Effective Date of Allowable Emissions: NA
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

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

Visible Emissions Limitation: Visible Emissions Limitation NA of

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [] Rule [] Other
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

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):	

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

Supplemental Requirements

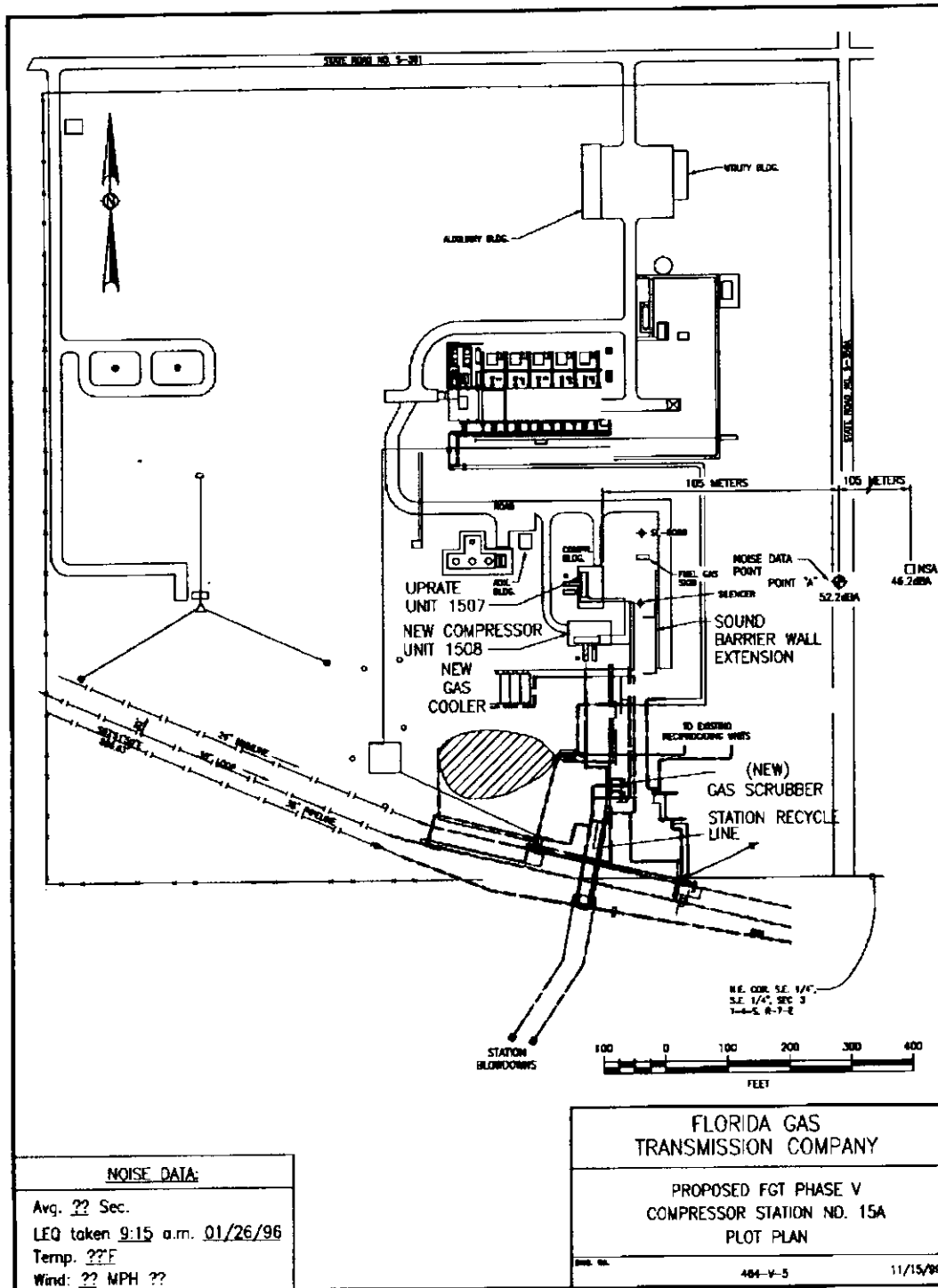
<p>1. Process Flow Diagram <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested</p>
<p>2. Fuel Analysis or Specification <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested</p>
<p>3. Detailed Description of Control Equipment <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested</p>
<p>4. Description of Stack Sampling Facilities <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested</p>
<p>5. Compliance Test Report <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously submitted, Date: _____ <input checked="" type="checkbox"/> Not Applicable</p>
<p>6. Procedures for Startup and Shutdown <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested</p>
<p>7. Operation and Maintenance Plan <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested</p>
<p>8. Supplemental Information for Construction Permit Application <input checked="" type="checkbox"/> Attached, Document ID: Narrative <input type="checkbox"/> Not Applicable</p>
<p>9. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable</p>
<p>10. Supplemental Requirements Comment: Supplemental information is provided in the narrative description accompanying these forms.</p>

Additional Supplemental Requirements for Title V Air Operation Permit Applications

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

Attachment B

Plot Plan



NOISE DATA:
Avg. ?? Sec.
LEQ taken 9:15 a.m. 01/26/96
Temp. ??°F
Wind: ?? MPH ??

FLORIDA GAS TRANSMISSION COMPANY
 PROPOSED FGT PHASE V
 COMPRESSOR STATION NO. 15A
 PLOT PLAN

FILE NO. 484-V-5 11/15/98

ATTACHMENT C

Vendor Information

Cooper-Rolls 501 KC-7 Turbine

Solar Mars 90 T-13000S Turbine

Waukesha Model L36GL Natural Gas-fired Reciprocating Engine

Cooper-Rolls 501 KC-7 Turbine

Allison Industrial Engine Performance & Emissions Estimate (EDR 18656)

Date: June 4, 2001
 Project: Florida Gas Site Analyses
 Engine Configuration: 501-KC7, DLE W/Diffuser Bleed

Parameter	Data Pt. No.	C/S 15 #1
Altitude (feet)		50
Ambient Press. (psia)		14.669
Relative Humidity		60
Specific Humidity		0.006366
Inlet Loss ("H2O)		0
Exhaust Loss ("H2O)		0
Inlet Pressure (CIP, psia)		14.669
Inlet Temperature (CIT, °F)		59
Inlet Flow (lb/sec)		45.24
MGT t/c (°F)		1375
Control Temp. (°F)		1935
Fuel Flow (MMBTU/hr)		57.3545
Fuel Flow (lb/hr)		2808.74
Output Shaft Speed (rpm)		13600
Gas Generator Speed (rpm)		14677
Shaft Power (hp)		7222.1
% of Full Load		100
SFC [lb/(hp*hr)]		0.3889
HeatRate[Shaft] BTU/(shp*hr)		7942
Exhaust Flow (lb/sec)		45.708
Exhaust Temp. (f/a, °F)		958
Exhaust P-static (psia)		14.67
Fuel	Ref Gas	
Fuel LHV (BTU/lb)		20420
H/C (wt ratio)		0.3261
Fuel Molecular Weight		16.6303
Fuel Specific Gravity		0.5902
Expected Emissions @ 15% O2		
NOx ppm		25
CO ppm		50
UHC ppm		20
VOC ppm		10
Expected Emissions (lb/eng-hr)		
NOx		5.7
CO		6.96
UHC		1.59
VOC		1.49
Exhaust Gas (vol %)		
CO2		2.94
H2O		6.63
O2		14.43
N2		75.1
Ar		0.9

Solar Mars 90 T-13000S Turbine

SOLAR TURBINES INCORPORATED
ENGINE PERFORMANCE CODE REV. 2.85
CUSTOMER: FGT
JOB ID:

DATE RUN: 26-NOV-00
RUN BY: Casadonte, Corrine

NEW EQUIPMENT PREDICTED EMISSION PERFORMANCE
DATA FOR STATION 15

Fuel: SD NATURAL GAS Customer: FGT
Water Injection: NO Inquiry Number: STATION 15
Number of Engines Tested: 3
Model: MARS 90-T13002S CS/MD 59F MATCH GAS
 SHIPMENTS AFTER 1/95
Emissions Data: REV. 1.0

CRITICAL WARNINGS IN USE OF DATA FOR PERMITTING

1. Short term permitting values such as PPMV or lbs/hr should be based on worst case actual operating conditions specific to the application and the site. Worst case for one pollutant is not necessarily the same for another. The values on this form are only predicted emissions at one specific operating condition; not necessarily the worst case.
2. Long term reference emission units (e.g. tons/yr) should reference the average conditions at the site (e.g. ISO). That number should not be derived from the worst case value referenced above, or conversely this average must not be used to calculate worst case.
3. Nominal values are based on actual test results, or predicted in the case of no actual engine tests. Expected maximum values should be referenced for permitting.
4. If a SoLoNOx model is planned to be installed in the future, use no less than 50 PPMv CO.

The following predicted emissions performance is based on the following specific single point: (see attached)

Hp= 13180, %Full Load= 100.0, Elev= 90 ft, %RH= 60.0, Temperature= 59.0 F

NOX		CO		UHC		
NOM	MAX	NOM	MAX	NOM	MAX	
15.63	25.00	7.89	50.00	0.000	25.000	PPMvd at 15% O2
6.28	10.04	1.93	12.23	0.000	3.502	lbm/hr
27.49	43.99	8.45	53.56	0.000	15.339	ton/yr

Hp= 12521, %Full Load= 95.0, Elev= 90 ft, %RH= 60.0, Temperature= 59.0 F

NOX		CO		UHC		
NOM	MAX	NOM	MAX	NOM	MAX	
12.49	25.00	10.56	50.00	0.000	25.000	PPMvd at 15% O2
4.82	9.64	2.48	11.74	0.000	3.363	lbm/hr
21.11	42.24	10.86	51.44	0.000	14.731	ton/yr

Hp= 11862, %Full Load= 90.0, Elev= 90 ft, %RH= 60.0, Temperature= 59.0 F

NOX		CO		UHC		
NOM	MAX	NOM	MAX	NOM	MAX	
9.62	25.00	14.73	50.00	0.000	25.000	PPMvd at 15% O2
3.55	9.23	3.31	11.23	0.000	3.217	lbm/hr
15.55	40.41	14.50	49.20	0.000	14.090	ton/yr

1.0 Hp= 11203, %Full Load= 85.0, Elev= 90 ft, %RH= 60.0, Temperature= 59.0 F

NOX		CO		UHC		
NOM	MAX	NOM	MAX	NOM	MAX	
7.53	25.00	20.23	50.00	0.000	25.000	PPMvd at 15% O2
2.66	8.81	4.34	10.73	0.000	3.074	lbm/hr
11.64	38.61	19.02	47.01	0.000	13.463	ton/yr

2.0 Hp= 9885, %Full Load= 75.0, Elev= 90 ft, %RH= 60.0, Temperature= 59.0 F

NOX		CO		UHC		
NOM	MAX	NOM	MAX	NOM	MAX	
6.57	25.00	24.46	50.00	0.000	25.000	PPMvd at 15% O2
2.19	8.34	4.97	10.15	0.000	2.908	lbm/hr
9.61	36.53	21.75	44.48	0.000	12.737	ton/yr

3.0 Hp= 9226, %Full Load= 70.0, Elev= 90 ft, %RH= 60.0, Temperature= 59.0 F

NOX		CO		UHC		
NOM	MAX	NOM	MAX	NOM	MAX	
6.23	25.00	26.50	50.00	0.000	25.000	PPMvd at 15% O2
2.02	8.12	5.24	9.89	0.000	2.831	lbm/hr
8.86	35.56	22.95	43.30	0.000	12.400	ton/yr

OTHER IMPORTANT NOTES

1. Solar does not provide maximum values for water-to-fuel ratio, SOx, particulates, or conditions outside those above without separate written approval.
2. Solar can optionally provide factory testing in San Diego to ensure the actual unit(s) meet the above values within the tolerances quoted. Pricing and schedule impact will be provided upon request.
3. Fuel must meet Solar standard fuel specification ES 9-98. Predicted emissions are based on the attached fuel composition, or, San Diego natural gas or equivalent.

4. If the above information is being used regarding existing equipment, it should be verified by actual site testing.

SOLAR TURBINES INCORPORATED
 ENGINE PERFORMANCE CODE REV. 2.85
 CUSTOMER: FGT
 JOB ID:

DATE RUN: 26-NOV-00
 RUN BY: Casadonte, Corrine

MARS 90-T13002S
 CS/MD
 59F MATCH
 GAS
 TME-2S REV. 2.1

DATA FOR NOMINAL PERFORMANCE

Fuel Type SD NATURAL GAS

Elevation Feet 90
 Inlet Loss in. H2O 0
 Exhaust Loss in. H2O 0

		LOAD	FULL	95%	90%	85%	75%	70%
Engine Inlet Temp.	Deg. F	59.0	59.0	59.0	59.0	59.0	59.0	59.0
Relative Humidity	%	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Elevation Loss	Hp	43	41	39	37	32	30	
Inlet Loss	Hp	0	0	0	0	0	0	0
Exhaust Loss	Hp	0	0	0	0	0	0	0
Driven Equipment Speed	RPM	8779	8653	8520	8385	8175	8057	
Optimum Equipment Speed	RPM	8779	8653	8520	8385	8175	8057	
Gas Generator Speed	RPM	11168	11078	10984	10892	10735	10652	
Specified Load	Hp	FULL	12521	11862	11203	9885	9226	
Net Output Power	Hp	13180	12521	11862	11203	9885	9226	
Fuel Flow	MMBtu/hr	100.88	96.90	92.71	88.61	83.84	81.63	
Heat Rate	Btu/Hp-hr	7654	7739	7816	7909	8482	8847	
Inlet Air Flow	lbm/hr	313865	307993	301963	295368	283401	277542	
Engine Exhaust Flow	lbm/hr	317728	311682	305468	298696	286537	280590	
PCD	psi(g)	224.6	218.5	212.3	205.7	190.0	182.0	
PT Inlet Temp. (T5)	Deg. F	1255	1232	1208	1185	1182	1185	
Compensated PTIT	Deg. F	1275	1252	1228	1205	1202	1205	
Exhaust Temperature	Deg. F	868	856	844	832	845	855	

Waukesha Model L36GL Natural Gas-fired Reciprocating Engine

Florida Gas Transmission Project - 540kW
 Waukesha Engine Model No. L36GL
 Engine Rating - 880 BHP (660 kW) @ 1800 RPM
 Compression Ratio - 11:1
 Engine Displacement - 2193 cu. in. / 36 liters

	Engine Load (%)	BMEP (PSI)	BHP
Power (BHP)	100	140	670
	75	100	502
	50	65	335

	Engine Load (%)	BMEP (PSI)	NMHC Emission
NMHC Emissions (g/bhp-hr)	100	140	0.28
	75	100	0.30
	50	65	0.39

	Engine Load (%)	BMEP (PSI)	Nox Emission
Nox Emissions (g/bhp-hr)	100	140	2
	75	100	1.98
	50	65	1.9

	Engine Load (%)	BMEP (PSI)	THC Emission
THC Emissions (g/bhp-hr)	100	140	1.86
	75	100	1.99
	50	65	2.6

	Engine Load (%)	BMEP (PSI)	CO Emission
CO Emissions (g/bhp-hr)	100	140	1.33
	75	100	1.52
	50	65	1.76

	Engine Load (%)	BMEP (PSI)	Fuel Cons.
Fuel Consumption (BTU/HR) x 1000	100	140	5132
	75	100	3880
	50	65	2845

C-10

HEAT REJECTION 3

**HEAT REJECTION AND OPERATING DATA
MODEL L36GL/GLD; HIGH SPEED TURBOS
130° F (54.5° C) AUX. WATER TEMPERATURE
180° F (82° C) JACKET WATER TEMPERATURE**

	BMEP (PSI)	4.0 ENGINE SPEED - RPM				
		1400	1500	1600	1700	1800
POWER (BHP)	185	-	770	820	870	925
	176	685	735	780	830	880
	160	620	670	710	755	800
	150	581	623	665	706	748
	125	485	519	554	588	623
	100	388	415	443	471	498
	75	291	312	332	353	374
	50	194	208	222	235	249
BRAKE SPEC FUEL CONS. (BTU/BHP-HR)	185	-	6785	6856	6920	6976
	176	6809	6830	6902	6966	7026
	160	6878	6923	6996	7062	7129
	150	6931	6991	7065	7132	7203
	125	7116	7208	7286	7357	7437
	100	7414	7533	7618	7693	7782
	75	7941	8076	8170	8255	8349
	50	9038	9161	9274	9378	9470
FUEL CONSUMPTION (BTU/HR) x 1000	185	-	5215	5620	6025	6430
	176	4645	4995	5380	5770	6165
	160	4265	4600	4960	5320	5685
	150	4030	4355	4695	5035	5385
	125	3450	3740	4035	4330	4635
	100	2875	3130	3375	3620	3880
	75	2310	2515	2715	2915	3120
	50	1750	1900	2055	2205	2360
HEAT TO JACKET WATER (BTU/HR) x 1000	185	-	1367	1457	1535	1615
	176	1248	1323	1410	1486	1565
	160	1172	1245	1325	1398	1471
	150	1124	1196	1272	1343	1413
	125	1004	1074	1140	1204	1269
	100	884	952	1007	1066	1125
	75	765	829	875	928	980
	50	645	707	742	789	836
HEAT TO LUBE OIL (BTU/HR) x 1000	185	-	141	165	181	197
	176	123	139	163	178	194
	160	119	136	159	174	190
	150	117	133	156	171	187
	125	112	128	150	165	179
	100	107	122	143	158	172
	75	102	116	137	151	165
	50	96.5	111	131	144	157
HEAT TO INTERCOOLER (BTU/HR) x 1000	185	-	297	327	376	425
	176	234	269	302	347	392
	160	192	223	259	298	337
	150	168	196	234	269	304
	125	115	137	175	201	228
	100	73	89	121	141	160
	75	41	52	72.5	87	101
	50	19	26	30	40.5	51.5



HEAT REJECTION 3

**HEAT REJECTION AND OPERATING DATA
MODEL L36GL/GLD; HIGH SPEED TURBOS
130° F (54.5° C) AUX. WATER TEMPERATURE
180° F (82° C) JACKET WATER TEMPERATURE
5.0**

	BMEP (PSI)	6.0 ENGINE SPEED - RPM				
		1400	1500	1600	1700	1800
HEAT TO RADIATION (BTU/HR) x 1000	185	-	107	110	113	116
	176	105	107	110	113	115
	160	106	108	110	112	115
	150	106	108	110	112	115
	125	106	108	109	112	114
	100	105	107	108	111	113
	75	102	105	107	109	112
	50	99.5	102	105	108	111
TOTAL ENERGY IN EXHAUST (BTU/HR) x 1000	185	-	1393	1525	1655	1790
	176	1237	1339	1463	1585	1710
	160	1138	1235	1344	1454	1570
	150	1073	1167	1268	1371	1478
	125	904	989	1073	1160	1252
	100	732	805	876	949	1027
	75	563	621	681	742	806
	50	404	445	493	541	591
EXHAUST TEMP AFTER TURBINE (+/- 50 °F)	185	-	800	817	830	843
	176	794	804	818	830	841
	160	799	809	818	828	838
	150	801	810	817	826	836
	125	799	809	813	822	830
	100	789	801	805	815	824
	75	771	786	794	806	817
	50	745	763	779	795	810
INDUCTION AIR FLOW (SCFM)	185	-	1485	1595	1705	1820
	176	1320	1415	1525	1630	1740
	160	1205	1300	1400	1500	1600
	150	1130	1220	1320	1415	1510
	125	955	1035	1120	1200	1285
	100	780	850	920	990	1060
	75	610	665	725	775	835
	50	450	490	530	575	615
EXHAUST GAS FLOW (LBS/HR)	185	-	6780	7280	7795	8310
	176	6020	6475	6965	7455	7950
	160	5495	5930	6390	6845	7310
	150	5170	5585	6025	6460	6900
	125	4360	4730	5115	5490	5875
	100	3570	3880	4210	4520	4840
	75	2805	3050	3310	3560	3820
	50	2070	2240	2440	2625	2815

**HEAT REJECTION AND OPERATING DATA
MODEL L36GL/GLD; HIGH SPEED TURBOS
130° F (54.5° C) AUX. WATER TEMPERATURE
180° F (82° C) JACKET WATER TEMPERATURE**



HEAT REJECTION 3

	BMEP (PSI)	Engine Speed - RPM				
		1400	1500	1600	1700	1800
NOx Emissions (g/bhp-hr)	185	-	2.66	2.66	2.54	2.42
	176	2.53	2.48	2.38	2.22	2.06
	160	2.50	2.42	2.35	2.18	2.00
	150	2.47	2.39	2.32	2.17	2.01
	125	2.40	2.33	2.26	2.12	1.99
	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
CO Emissions (g/bhp-hr)	185	-	1.25	1.24	1.25	1.27
	176	1.34	1.28	1.29	1.31	1.34
	160	1.32	1.40	1.35	1.34	1.32
	150	1.38	1.42	1.39	1.31	1.23
	125	1.43	1.45	1.42	1.42	1.43
	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
NMHC Emissions (g/bhp-hr)	185	-	0.30	0.28	0.26	0.24
	176	0.36	0.30	0.28	0.26	0.24
	160	0.33	0.31	0.30	0.28	0.25
	150	0.35	0.32	0.31	0.29	0.27
	125	0.36	0.32	0.32	0.30	0.29
	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
THC Emissions (g/bhp-hr)	185	-	1.99	1.84	1.60	1.53
	176	2.38	1.99	1.84	1.73	1.61
	160	2.22	2.07	1.99	1.84	1.69
	150	2.30	2.11	2.07	1.94	1.80
	125	2.38	2.15	2.15	2.03	1.92
	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



HEAT REJECTION 3

NOTES:

1. 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.
2. 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.
3. ISO Standard (continuous) power ratings conform to ISO 3046/1, latest version, with a mechanical efficiency of 90% and auxiliary water temperature, T_{cra}, 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.
4. 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.
5. Standard ignition timing is 13° BTDC with J-type 60999T or 60999W spark plugs and 15° BTDC with 4-ground 60999S spark plugs.
6. For heat rejection changes due to engine jacket water outlet temperature higher than standard (Note 1), refer to S-7613-3, latest version.
7. Total Exhaust Energy includes both recoverable and non-recoverable heat. For a procedure to calculate recoverable heat refer to S-8117-1, latest version.
8. Exhaust oxygen concentration set to 7.8% at rated speed and load at standard timing to provide 2 g/bhp-hr or less NO_x. This oxygen level is measured at the port located in the exhaust manifold upstream of the turbocharger.
9. Low pressure (draw thru) fuel system on the GLD model.
10. Reference Engine Ratings and Fuel Consumption curve sheets C-1108-14 and C-1108-16.
11. Exhaust flow at nominal 29.54 inches Hg. (100 kPa) atmospheric pressure:

$$\text{Flow rate (English): ACFM} = \frac{(\text{Exh. Flow, lb/hr}) \times (\text{Exh. Temp. } ^\circ\text{F} + 460)}{2275}$$



Attachment D
Emission Calculations

Engine Emissions
Engine HAP Emissions
Fugitive Leak Emissions

Engine Emissions

Engine No. 1507 EPN:

NOx Emissions: (Based on Vendor Data)

$$\text{lb NOx/hr} = 10.04$$

$$\begin{aligned} \text{tons NOx/yr} &= (\text{lb NOx/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (10.0 \text{ lb NOx/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 43.98 \end{aligned}$$

CO Emissions: (Based on Vendor Data)

$$\text{lb CO/hr} = 12.23$$

$$\begin{aligned} \text{tons CO/yr} &= (\text{lb CO/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (12.23 \text{ lb CO/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 53.57 \end{aligned}$$

VOC Emissions: (Based on Vendor Data)

$$\text{lb VOC/hr} = 0.350$$

$$\begin{aligned} \text{tons VOC/yr} &= (\text{lb VOC/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (0.350 \text{ lb VOC/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 1.53 \end{aligned}$$

SO2 Emissions: (Based on FERC Limits)

$$\begin{aligned} \text{lb S/hr} &= (\text{gr S}/100 \text{ scf})(\text{MMscf/hr})(1 \text{ lb}/7000 \text{ gr}) \\ &= (10 \text{ gr S}/100 \text{ scf})(0.1067 \text{ MMscf/hr})(1 \text{ lb}/7000 \text{ gr}) \\ &= 1.52 \end{aligned}$$

$$\begin{aligned} \text{lb SO2/hr} &= (\text{lb S/hr})(2 \text{ lb SO2}/\text{lb S}) \\ &= (1.52 \text{ lb S/hr})(2 \text{ lb SO2}/\text{lb S}) \\ &= 3.05 \end{aligned}$$

$$\begin{aligned} \text{tons SO2/yr} &= (\text{lb SO2/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (3.05 \text{ lb SO2/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 13.35 \end{aligned}$$

PM 10/2.5 Emissions: (Based on AP-42 Table 3.1-2a, 4/00)

$$\begin{aligned} \text{lb PM/hr} &= (\text{lb PM}/\text{MMscf})(\text{MMBtu/hr}) \\ &= (0.0066 \text{ lb}/\text{Btu})(110.97 \text{ MMBtu/hr}) \\ &= 0.73 \end{aligned}$$

$$\begin{aligned} \text{tons PM/yr} &= (\text{lb PM/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (0.73 \text{ lb PM/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 3.21 \end{aligned}$$

Engine No. 1508 EPN:

NOx Emissions: (Based on Vendor Data)

$$\text{lb NOx/hr} = 5.70$$

$$\begin{aligned} \text{tons NOx/yr} &= (\text{lb NOx/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (5.7 \text{ lb NOx/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 24.97 \end{aligned}$$

CO Emissions: (Based on Vendor Data)

$$\text{lb CO/hr} = 6.96$$

$$\begin{aligned} \text{tons CO/yr} &= (\text{lb CO/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (7.0 \text{ lb CO/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 30.48 \end{aligned}$$

VOC Emissions: (Based on Vendor Data)

$$\text{lb VOC/hr} = 1.49$$

$$\begin{aligned} \text{tons VOC/yr} &= (\text{lb VOC/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (1.490 \text{ lb VOC/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 6.53 \end{aligned}$$

SO2 Emissions: (Based on FERC Limits)

$$\begin{aligned} \text{lb S/hr} &= (\text{gr S}/100 \text{ scf})(\text{MMscf/hr})(1 \text{ lb}/7000 \text{ gr}) \\ &= (10 \text{ gr S}/100 \text{ scf})(0.0607 \text{ MMscf/hr})(1 \text{ lb}/7000 \text{ gr}) \\ &= 0.87 \end{aligned}$$

$$\begin{aligned} \text{lb SO2/hr} &= (\text{lb S/hr})(2 \text{ lb SO2}/\text{lb S}) \\ &= (0.87 \text{ lb S/hr})(2 \text{ lb SO2}/\text{lb S}) \\ &= 1.73 \end{aligned}$$

$$\begin{aligned} \text{tons SO2/yr} &= (\text{lb SO2/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (1.73 \text{ lb SO2/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 7.60 \end{aligned}$$

PM 10/2.5 Emissions: (Based on AP-42 Table 3.1-2a, 4/00)

$$\begin{aligned} \text{lb PM/hr} &= (\text{lb PM}/\text{MMscf})(\text{MMBtu/hr}) \\ &= (0.0066 \text{ lb/Btu})(63.09 \text{ MMBtu/hr}) \\ &= 0.42 \end{aligned}$$

$$\begin{aligned} \text{tons PM/yr} &= (\text{lb PM/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (0.42 \text{ lb PM/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 1.82 \end{aligned}$$

Engine No. Gen 3 EPN:

NOx Emissions: (Based on Vendor Data)

$$\begin{aligned}\text{lb NOx/hr} &= (\text{g/bhp-hr})(\text{bhp})(1 \text{ lb}/453.59 \text{ g}) = \text{lb/hr} \\ &= (2.0 \text{ g/bhp-hr})(670 \text{ bhp})(1 \text{ lb}/453.59 \text{ g}) \\ &= 2.95\end{aligned}$$

$$\begin{aligned}\text{tons NOx/yr} &= (\text{lb NOx/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (3.0 \text{ lb NOx/hr})(500 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 0.739\end{aligned}$$

CO Emissions: (Based on Vendor Data)

$$\begin{aligned}\text{lb CO/hr} &= (\text{g/bhp-hr})(\text{bhp})(1 \text{ lb}/453.59 \text{ g}) = \text{lb/hr} \\ &= (1.3 \text{ g/bhp-hr})(670 \text{ bhp})(1 \text{ lb}/453.59 \text{ g}) \\ &= 1.96\end{aligned}$$

$$\begin{aligned}\text{tons CO/yr} &= (\text{lb CO/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (2.0 \text{ lb CO/hr})(500 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 0.491\end{aligned}$$

VOC Emissions: (Based on Vendor Data)

$$\begin{aligned}\text{lb VOC/hr} &= (\text{g/bhp-hr})(\text{bhp})(1 \text{ lb}/453.59 \text{ g}) = \text{lb/hr} \\ &= (0.28 \text{ g/bhp-hr})(670 \text{ bhp})(1 \text{ lb}/453.59 \text{ g}) \\ &= 0.41\end{aligned}$$

$$\begin{aligned}\text{tons VOC/yr} &= (\text{lb VOC/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (0.41 \text{ lb VOC/hr})(500 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 0.10\end{aligned}$$

SO2 Emissions: (Based on FERC Limits)

$$\begin{aligned}\text{lb S/hr} &= (\text{gr S}/100 \text{ scf})(\text{MMscf/hr})(1 \text{ lb}/7000 \text{ gr}) \\ &= (10 \text{ gr S}/100 \text{ scf})(0.0049 \text{ MMscf/hr})(1 \text{ lb}/7000 \text{ gr}) \\ &= 0.070\end{aligned}$$

$$\begin{aligned}\text{lb SO2/hr} &= (\text{lb S/hr})(2 \text{ lb SO2}/\text{lb S}) \\ &= (0.070 \text{ lb S/hr})(2 \text{ lb SO2}/\text{lb S}) \\ &= 0.14\end{aligned}$$

$$\begin{aligned}\text{tons SO2/yr} &= (\text{lb SO2/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (0.14 \text{ lb SO2/hr})(500 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 0.04\end{aligned}$$

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

$$\begin{aligned}\text{lb PM/hr} &= (\text{lb PM}/\text{MMBtu})(\text{MMBtu/hr}) \\ &= (0.00999 \text{ MMBtu/hr})(5.1 \text{ MMBtu/hr}) \\ &= 0.0513\end{aligned}$$

$$\begin{aligned}\text{tons PM/yr} &= (\text{lb PM/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (0.051 \text{ lb PM/hr})(500 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 0.01\end{aligned}$$

Engine HAP Emissions

GRI-HAPCalc Version 3.0 is a personal computer-based database program that estimates emissions of hazardous air pollutants (HAPs) and criteria pollutants from natural gas industry operations. HAPCalc 3.0 estimates emissions from the following point sources: amine sweetening units, sulfur recovery units, reciprocating engines, combustion turbines, small external combustion devices, flares, liquid hydrocarbon storage tanks, truck loading, miscellaneous process vents, and fugitives.

Emissions are estimated with factors derived from data collected during various GRI Environment and Safety research programs or by the U.S. Environmental Protection Agency (EPA). The GRI Literature database, developed during Phase I of the Air Toxics Program (1990 to 1992), compiled available emission test results from 40 reciprocating engines, 2 gas turbines, and 1 steam generator. The GRI Field Test database, developed from 1994 to 1997, contains GRI test data from 26 engines, 9 gas turbines, and 8 external combustion devices operating at several natural gas transmission, storage, and processing facilities. EPA emission factors are obtained from AP-42, 5th Edition [U.S. Environmental Protection Agency].

Since data are not available for all pollutants for some of the emission factor sets, a hierarchical combination of EPA > GRI Field > GRI Literature was used. Emission factors are prioritized in the listed order.

Turbine 1507 HAP Emission Factors and Emissions

Chemical	EF, g/hp-hr	tpy	lb/hr	Source	Factor
Formaldehyde	0.0146323	1.86057107	0.42478792	EPA > FIELD > LITERATURE	EPA
Acetaldehyde	0.0003443	0.04377949	0.00999532	EPA > FIELD > LITERATURE	EPA
1,3-Butadiene	0.0000019	0.00024159	0.00005516	EPA > FIELD > LITERATURE	EPA
Acrolein	0.000034	0.00432327	0.00098705	EPA > FIELD > LITERATURE	EPA
Propional	0.000865	0.10998913	0.02511167	EPA > FIELD > LITERATURE	GRI Field
Propylene Oxide	0.0001248	0.01586895	0.00362305	EPA > FIELD > LITERATURE	EPA
n-Nitrosodimethylamine	0.000001	0.00012716	0.00002903	EPA > FIELD > LITERATURE	EPA
Benzene	0.0006025	0.07661093	0.01749108	EPA > FIELD > LITERATURE	EPA
Toluene	0.0005595	0.07114326	0.01624275	EPA > FIELD > LITERATURE	EPA
Ethylbenzene	0.0001033	0.01313512	0.00299889	EPA > FIELD > LITERATURE	EPA
Xylenes(m,p,o)	0.0001162	0.01477542	0.00337338	EPA > FIELD > LITERATURE	EPA
2,2,4-Trimethylpentane	0.0016053	0.20412203	0.0466032	EPA > FIELD > LITERATURE	GRI Field
n-Hexane	0.0015058	0.1914701	0.04371463	EPA > FIELD > LITERATURE	GRI Field
Phenol	0.0001101	0.01399977	0.0031963	EPA > FIELD > LITERATURE	GRI Field
n-Nitrosomorpholine	0.000001	0.00012716	0.00002903	EPA > FIELD > LITERATURE	EPA
Naphthalene	0.0006025	0.07661093	0.01749108	EPA > FIELD > LITERATURE	EPA
2-Methylnaphthalene	0.0000013	0.0001653	0.00003774	EPA > FIELD > LITERATURE	GRI Field
Biphenyl	0.0003305	0.04202475	0.00959469	EPA > FIELD > LITERATURE	GRI Field
Phenanthrene	0.0000005	0.00006358	0.00001452	EPA > FIELD > LITERATURE	GRI Field
Chrysene	0.000001	0.00012716	0.00002903	EPA > FIELD > LITERATURE	GRI Field
Beryllium	0.0000001	0.00001272	0.0000029	EPA > FIELD > LITERATURE	GRI Field
Phosphorous	0.0000652	0.00829051	0.00189281	EPA > FIELD > LITERATURE	GRI Field
Chromium	0.0000056	0.00071207	0.00016257	EPA > FIELD > LITERATURE	EPA
Chromium	0.0000082	0.00104267	0.00023805	EPA > FIELD > LITERATURE	GRI Field
Manganese	0.0000069	0.00087737	0.00020031	EPA > FIELD > LITERATURE	EPA
Nickel	0.0000061	0.00077565	0.00017709	EPA > FIELD > LITERATURE	GRI Field
Cobalt	0.0000016	0.00020345	0.00004645	EPA > FIELD > LITERATURE	GRI Field
Arsenic	0.0000002	0.00002543	0.00000581	EPA > FIELD > LITERATURE	EPA
Selenium	0.0000003	0.00003815	0.00000871	EPA > FIELD > LITERATURE	GRI Field
Cadmium	0.0000036	0.00045776	0.00010451	EPA > FIELD > LITERATURE	EPA
Mercury	0.0000019	0.00024159	0.00005516	EPA > FIELD > LITERATURE	EPA
Lead	0.0000689	0.00876098	0.00200022	EPA > FIELD > LITERATURE	EPA
TOTALS	0.0217114	2.76071452	0.63030011		

Turbine 1508 HAP Emission Factors and Emissions

Chemical	EF, g/hp-hr	tpy	lb/hr	Source	Factor
Formaldehyde	0.0146323	1.0195026	0.23276315	EPA > FIELD > LITERATURE	EPA
Acetaldehyde	0.0003443	0.02398903	0.00547695	EPA > FIELD > LITERATURE	EPA
1,3-Butadiene	0.0000019	0.00013238	0.00003022	EPA > FIELD > LITERATURE	EPA
Acrolein	0.000034	0.00236894	0.00054085	EPA > FIELD > LITERATURE	EPA
Propional	0.000865	0.0602687	0.01375998	EPA > FIELD > LITERATURE	GRI Field
Propylene Oxide	0.0001248	0.00869542	0.00198525	EPA > FIELD > LITERATURE	EPA
n-Nitrosodimethylamine	0.000001	0.00006967	0.00001591	EPA > FIELD > LITERATURE	EPA
Benzene	0.0006025	0.04197907	0.00958426	EPA > FIELD > LITERATURE	EPA
Toluene	0.0005595	0.03898305	0.00890024	EPA > FIELD > LITERATURE	EPA
Ethylbenzene	0.0001033	0.00719741	0.00164324	EPA > FIELD > LITERATURE	EPA
Xylenes(m,p,o)	0.0001162	0.00809621	0.00184845	EPA > FIELD > LITERATURE	EPA
2,2,4-Trimethylpentane	0.0016053	0.11184896	0.02553629	EPA > FIELD > LITERATURE	GRI Field
n-Hexane	0.0015058	0.10491632	0.0239535	EPA > FIELD > LITERATURE	GRI Field
Phenol	0.0001101	0.0076712	0.00175141	EPA > FIELD > LITERATURE	GRI Field
n-Nitrosomorpholine	0.000001	0.00006967	0.00001591	EPA > FIELD > LITERATURE	EPA
Naphthalene	0.0006025	0.04197907	0.00958426	EPA > FIELD > LITERATURE	EPA
2-Methylnaphthalene	0.0000013	0.00009058	0.00002068	EPA > FIELD > LITERATURE	GRI Field
Biphenyl	0.0003305	0.02302752	0.00525743	EPA > FIELD > LITERATURE	GRI Field
Phenanthrene	0.0000005	0.00003484	0.00000795	EPA > FIELD > LITERATURE	GRI Field
Chrysene	0.000001	0.00006967	0.00001591	EPA > FIELD > LITERATURE	GRI Field
Beryllium	0.0000001	0.00000697	0.00000159	EPA > FIELD > LITERATURE	GRI Field
Phosphorous	0.0000652	0.0045428	0.00103717	EPA > FIELD > LITERATURE	GRI Field
Chromium	0.0000056	0.00039018	0.00008908	EPA > FIELD > LITERATURE	EPA
Chromium	0.0000082	0.00057133	0.00013044	EPA > FIELD > LITERATURE	GRI Field
Manganese	0.0000069	0.00048076	0.00010976	EPA > FIELD > LITERATURE	EPA
Nickel	0.0000061	0.00042502	0.00009704	EPA > FIELD > LITERATURE	GRI Field
Cobalt	0.0000016	0.00011148	0.00002545	EPA > FIELD > LITERATURE	GRI Field
Arsenic	0.0000002	0.00001393	0.00000318	EPA > FIELD > LITERATURE	EPA
Selenium	0.0000003	0.0000209	0.00000477	EPA > FIELD > LITERATURE	GRI Field
Cadmium	0.0000036	0.00025083	0.00005727	EPA > FIELD > LITERATURE	EPA
Mercury	0.0000019	0.00013238	0.00003022	EPA > FIELD > LITERATURE	EPA
Lead	0.0000689	0.00480059	0.00109603	EPA > FIELD > LITERATURE	EPA
	0.0217114	1.51273748	0.34537384		

Fugitive Leak Emissions

Fugitive Emissions Factors					
Component		Service	Emissions *		
			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	0.00021004
Flanges		Light Oil	0.0010624	0.00024256	0.00011002
Open-Ended Line		Light Oil	0.0135211	0.00308701	0.00140027
Pumps		Light Oil	0.1255527	0.02866500	0.01300244
Other		Light Oil	0.0724343	0.01653751	0.00750142
Valves		Heavy Oil	0.0000811	0.00001852	0.00000840
Connector		Heavy Oil	0.0000724	0.00001653	0.00000750
Flanges		Heavy Oil	0.0000038	0.00000087	0.00000039
Open-Ended Line		Heavy Oil	0.0013521	0.00030870	0.00014003
Pumps		Heavy Oil	NA	0.00529	NA
Other		Heavy Oil	0.0002994	0.00006836	0.00003101

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

New Components					
Component	Service	Component Count	Emissions * Factor (ton/yr)	NM/NE Fraction	Emissions (ton/yr)
Valves	Gas	143	0.0434606	0.05	0.31
Connector	Gas	0	0.0019316	0.05	0.00
Flanges	Gas	128	0.0037666	0.05	0.02
Open-Ended Line	Gas	38	0.0193158	0.05	0.04
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	36	0.0010624	1.00	0.04
Open-Ended Line	Light Oil	2	0.0135211	1.00	0.03
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:	0.9531